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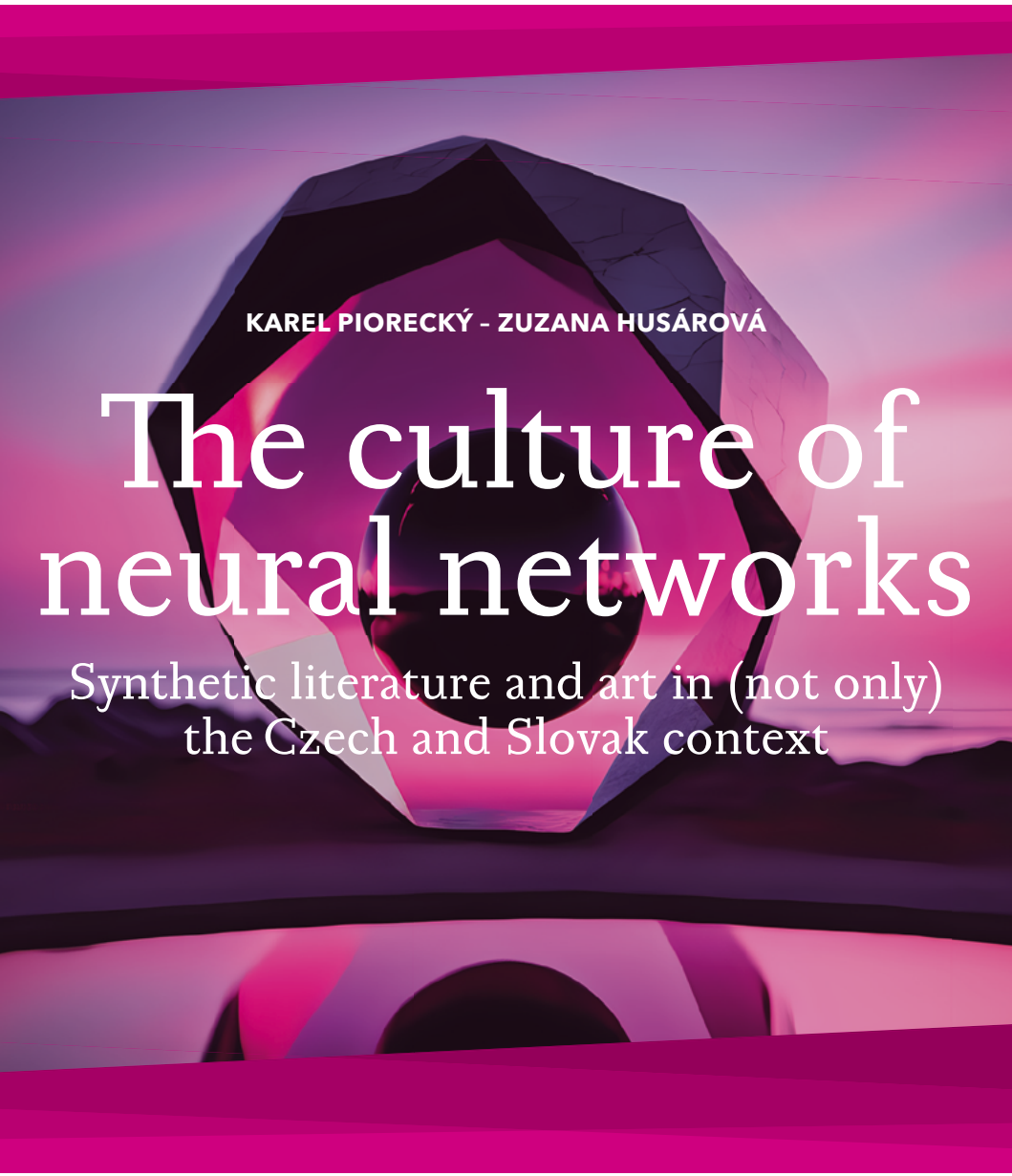

KAREL PIORECKÝ – ZUZANA HUSÁROVÁ

The culture of neural networks

Synthetic literature and art in (not only) the Czech and Slovak context

INSTITUTE OF CZECH LITERATURE
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Karel Piorecký – Zuzana Husárová

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Charles University
Karolinum Press

www.karolinum.cz
ebooks@karolinum.cz

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The dusk of artificial intelligence

This book is not about artificial intelligence. Rather, it is about what is labelled artificial intelligence in public discourse. That is, it is about the shorthand that makes artificial neural network technology an achievable objective of artificial intelligence, though this still remains a futuristic fantasy. However, this book is not about technology either; rather, it is about what artificial neural network technology will achieve in the world of art and literature – and indeed in the inner worlds of the human imagination. This book is about culture, which we understand as a set of "performative language-games" (Barker 2004: 45) circulating without clear rules or boundaries around a point that only recently ceased to be merely an experimental technology and has become a driver of cultural processes and interactions. This point, which on this occasion constitutes the focus of our professional interest, is the action of neural nets (NNs), as we are already used to calling the type of software that has rapidly become part of our daily lives and has thereby earned this familiar label.

By "culture of neural networks" (CoNN), a term that has also infiltrated the title of this book, we mean the processes and interactions in the network of actors formed particularly by the technologies of artificial neural networks themselves; the corporations developing them; the software users; the products (works of art) generated; their recipients – the media disseminating these products; and last but not least the metatexts and paratexts accompanying them. The culture of neural networks is very buoyant and is evolving dynamically; it functions as a new culture, albeit one intrinsically linked to cultural tradition. For this reason, one of the questions we ask ourselves is

directed at the relationship between old and new; at the relationship between cultural tradition and how it is evaluated during the generative processes activated by neural networks; at the relationship between new technology and older methods of producing artistic artefacts; at the differences between existing ways of perceiving artworks and the anticipated reception of NN-generated artworks.

Are we on the brink of a new phase in the digital revolution, as Anthony Elliott indicates in the subtitle of his book *The Culture of AI. Everyday Life and the Digital Revolution* (2019)? Or is the time denoted by these grand words yet to come? It is certain, and undeniable, that the culture of neural networks (or rather the language games comprising them) has great demythologizing potential (e.g., in relation to the aura of artworks and their creators, or to the general idea of what creativity is), but may also still create a mythology, possibly even by mythologizing itself. One of the myths obscuring this entire field is the concept of artificial intelligence, or to be more precise, the uncritical, unreflective use of artificial intelligence. We definitely would not define the age in which we live as the age of the "rise of artificial intelligence". In a certain sense of the word, we find ourselves in the opposite situation: the key term "artificial intelligence" is starting to decline, simply because the media falsify it and use it as a name for software systems that, although they complete their tasks ever more perfectly, still have nothing in common with intelligence, if only because they are unaware of the said tasks, they are set up to complete a single type of activity, they depend on sets of training data, they "hallucinate" unpredictably, and so on. Strictly speaking, the metaphor epitomizing our time is not the dawn of artificial intelligence, but its dusk.

As a result, you will hear nothing about the "culture of artificial intelligence" from us. On the contrary, we will attempt to avoid the term on the following pages – unless, of course, we intend targeted criticism. Naturally, we do not wish to delegitimize in this way the concept that has become the core of Elliott's approach in the above-mentioned monograph. The issue is rather the fundamental

methodological differences between our work and his, the difference in our initial assumptions and still more in the different objectives we are moving towards.

Similarly, our approach and goals differ from other authors whom we might label as technooptimists (or technoutopians), whose ideas we do not plan to debate – precisely because they operate in areas beyond the scope of our expertise in literary and art theory, such as Mustafa Suleyman in his book *The Coming Wave*, who considers the future of AI primarily with regard to its application in biology (and the subsequent impacts on the quality and length of human life). We also do not wish to venture into the realm of forecasting the future and the time remaining until AI reaches the state of singularity – like Ray Kurzweil does, although some of his ideas are very close to us (e.g., the assumption that human and machine creativity will reach a stage of mutual indistinguishability). We mention Elliott's book here as an example of a scientific approach (not visionary essayism) to which we want to offer an alternative in the cultural field of art and literature. In our work, we build upon the positions of authors who deal with the topic of AI in the field of computer and cognitive science (such as Erik J. Larson), in the context of digital literature (such as David Jhave Johnston and Hannes Bajohr), in the context of art studies (such as Lev Manovich and Emanuele Arielli), and others.

Anthony Elliott defines the culture of artificial intelligence thus: "the general social process by which everyday life and modern institutions become increasingly influenced and shaped by the digitalized and technical apparatuses of AI" (Elliott 2019: 51). In doing so, he emphasizes that understanding these processes is "crucial for understanding the world today, a world which is increasingly overlaid by digital networks of communication, AI technical systems, institutionalized automation and advanced robotics" (ibid.). In reaching this understanding, he focuses on the transformation of social relationships instigated by digital technologies and constructs his basic argument from this sociological position: "A central argument of this book is that the robotics revolution and AI impact upon not only

work, employment and unemployment, but also social relationships in the broadest sense. We can adequately grasp the social impact of robotics and AI only if we question the general notion that digital technologies leave relations between people essentially unaltered." (2019: 19)

We, however, do not approach this issue from a sociological perspective, but primarily from the perspective of discourse analysis, guided by a linguistically founded definition of culture to which we can claim allegiance. Also, the subject of our interest is different, and above all, much narrower – it is the process of establishing artificial neural networks in literature and the visual arts, and the ramifications of this process for artificial communication. In material terms, then, our work focuses first and foremost on Czech and Slovak production. We will attempt to present it in full and of course we will contextualize it with a selection of relevant artistic projects resulting from other national environments and also originating from a wider diachronic area. Our basic contextual framework, then, is not the evolution of society as a whole, but rather the evolution of the art forms affected by the culture of neural networks – not, of course, as an extraneous element, but rather as an accelerator of processes that have been underway for a long time now. The evolutionary or temporal perspective itself also plays a much more important role in our exegesis, because one of our objectives is to document the evolution of CoNN until now, even though this very swift evolution took place within such a narrow timeframe. By contrast, Elliott is not interested in the development of technologies labelled as AI or the differences between them; he often writes about "complex digital systems". He is, in fact, more generally concerned with the development of digital culture and its influence on society, not with the specifics of individual technologies and reflections of those technologies.

At the same time, of course, we will resist attempting to predict the future that so-called artificial intelligence may bring. Here too, our work diverges from the techno-optimistic predictions of AI, which seek to provide qualified guesses about the future evolution

of society. Our book refrains from doing so, also with regard to the fact that we were obliged to reassess our starting points and conclusions on several occasions while we were writing it, because development outstripped our interpretations and unpredictably shifted the entire scene into a new light. Therefore, please also see our book as a document of the status in which the culture of neural networks found itself in summer 2023, when we completed the manuscript of this monograph. We ourselves see the process of creating our manuscript as a certain form of archaeology in the culture of neural networks, which however continues in a permanent process of self-formation.

Consequently, our concepts and the techno-optimistic ones complement each other, though we do end up in a polemical relationship over some aspects. This occurs particularly where authors seek to convey the ethos of revolutionary changes that AI supposedly brings when it inevitably reshapes society and establishes a new world order – a vision that has been initially projected by sci-fi narratives, which the techno-optimists have adopted and expanded. We can no longer share this position. We consider phrases about changes in the world order to be exaggerated (although we recognize the significant changes that AI brings to medicine, biochemistry, transportation, and science in general). It is enough to be aware of how much of the language of that nation is represented in the data on which contemporary "AI" was trained, and this global change immediately appears in different proportions. In the same way, the approach to technologies based on AI is disproportionate: regions contending with poverty and lower levels of education will find them much more difficult to obtain than, for example, the nations of what is known as the rich north. The world order, still governed by the principles of global capitalism, is in no way undergoing revolutionary changes; rather, it is by far being confirmed and consolidated thanks to "modern AI" (Matteo Pasquinelli, for example, deals critically with the issue of AI based on intelligence from work and social relationships in his book *The Eye of the Master*, 2023).

In our interpretation, CoNN is still essentially associated with human activity or intentionality, even though the current development of AI in synthetic biology (e.g., the BacterAI project) suggests the possibility of creating self-organizing systems. CoNN is organically inherent in processes ongoing now for some time (e.g., vernacularization), though it is able to accelerate certain aspects thereof, and add new ones, but it also elicits counter-reactions, and it motivates, for example, bearers of human creativity to greater self-confidence (and indeed self-awareness), inspiring them to defend their unique creative space. From our perspective, AI is not changing the world order or the "order" of art and literature – it initiates or accelerates partial changes that in fact are not marginal (otherwise there would be no point in writing this book either), but neither does it deviate from the paradigm of digital culture that has now been established for decades and so does not constitute a revolutionary change.

Where Elliott embarks on analysis of the public discourse around the evolution of AI, he unfortunately resorts to the binary opposition of sceptics and transformationists. He claims that sceptics are in the minority today (see Elliott 2022: 26), but that they nevertheless influence "public opinion and much policy thinking on AI and its ramifications". The basis of their position is apparently the assertion that "claims of an AI revolution are overblown" and that AI is a mere phantom, utilized "to explain away complex institutional changes occurring throughout the world today". Transformationists, conversely, see in AI a revolution bringing radical changes, that is, "the dawn of a new era, one in which the intersecting forces of economy, society and politics shift in fundamentally new directions (…), AI powerfully disrupts traditional ways of doing things, ushering in new economic conditions, social divisions and political alignments" (ibid.). Elliott himself evidently identifies with the transformationist position. We do not accept this binary division. We see our position as being somewhere between these two extremes and the aim of our book is to promote this central, techno-realist position which, as we believe, is the only one that may result in enjoyment of the benefits

offered by CoNN, while not over-valuing the changes it may entail, and at the same time, not underestimating any potentially associated risks. And with this in mind, our book is structured into the following chapters:

We consider it fundamental to perceive so-called artificial intelligence in the broad historic, indeed diachronic, context. Therefore, we seek in the chapter *The technological imagination as a source of the culture of neural networks* to map the oldest sources from which CoNN has emerged. These sources are both scientific, that is, the theoretical bases given to the concept of artificial intelligence by the trailblazers of computer science in the 1950s, and the artistic sources in which the long history of the technological imagination is written, testifying to the age-old human desire to create an artificial being. We trace this story of the power of the imagination from its ancient beginnings right up to manifestations in modern science fiction. The second context, without knowledge of which the modern outputs of artistic texts or images generated using neural networks cannot be adequately assessed, is the context of the development of generative art, which again extends over several centuries. The chapter *Generative literature and its history* is devoted to contextualizing this; it also transcends the boundaries of digital culture in its diachronic scope, starts to trace the evolution of generated poetry from its Baroque inception to the first computer-generated Czech and Slovak poems in the 1960s and 1980s. Our book is primarily concerned with the output of generated artistic texts and images, although of course we are aware that this topic cannot be satisfactorily discussed without at least a basic understanding of the technologies that enable the creation of these artefacts. That is why we have also included the chapter *Artificial neural networks and their functioning principles*, which gradually and briefly introduces the individual generations of neural networks whose generative abilities produced the works that we go on to analyse. We consider a basic awareness of this technological context necessary in order to receive and interpret contemporary generative literature and art. Three chapters follow in which we

analyse examples of the specific deployment of neural networks to generate texts within the context of the three basic literary genres. In essence, we have attempted to structure these chapters internally to reference the developmental chronology of neural networks and large language models. In the chapter *Generating poetic texts*, it was relatively easy to adhere to this structure, although in the conclusion we did have to depart from it somewhat, so as not to give the erroneous impression that the linear development from smaller to ever larger language models also produces ever better results when generating poetry. Similarly, in the conclusion to the chapter *Prose texts and narrative assistants*, we have had to take a small side-step and shift attention away from analysing the outcomes of generative projects and towards digital narrative assistants (as the chapter title indicates), which brought with them the vernacular phases of deploying neural networks and ChatGPT. The chapter *Deploying neural networks in drama and theatre praxis* required a more significant diversion from the chronological structure of our exegesis. This chapter's composition is more strongly influenced by the genre-typology aspect (the application of neural networks in improvised, immersive and interactive theatre, and the generation of synthetic scripts and dramas), although the developmental perspective is also applied. (In addition to poetry, prose and drama, artificial neural networks also influence the very significant field of literary translation. However, we have deliberately not included this sphere in our book, as in its own right it constitutes a problem falling rather into the context of natural language processing, which we leave to specialists in computational linguistics and other experts.) The culture of neural networks affects all types of art. In our book we wanted to illustrate this fact by at least including the chapter *Synthetic visual art*, which allows us to take a look at the specifics, but also the points of contact between projects aiming to generate synthetic texts and synthetic images – and also to become familiar with cases in which neural networks were deployed in curatorial activities and when preparing exhibitions. The insight into the application of neural networks in other forms of art is also

mediated by the chapter *Intermedia and musical synthetic works*, which likewise documents the tendency of CoNN to interdisciplinarity and to transcending notional boundaries between individual types of art. In this chapter (and others), interdisciplinarity proved to be an essential feature of CoNN, which boosts its creative potential but may also lead to fears that AI will gain control of the entire cultural space. These fears or, on the other hand, disproportionate expectations, do not, of course, arise from the neural networks themselves, but more likely from the language games resulting from their activities, and which largely originate in the methods in which individual generative projects are presented. The following chapter, *Presentation strategies for synthetic textual media*, is devoted to precisely these questions. In it, we analyse the paratexts accompanying the output of generative projects when their results are published and we compile the typology of the strategies, or partial language games, that are very frequently involved in mythologizing "artificial intelligence" and thus hamper the critical perception thereof. The next chapter, called *Reception mechanisms for synthetic textual media*, covers specific aspects of the reception of synthetic literary works. The chapter also builds on the analysis of specific reception metatexts but aims, however, to establish the two types of reading that can be abstracted from the texts of reviews and other metatexts: reading of artificiality and literary metareading. Alongside reception, our book naturally also considers complementary questions associated with the issue of production, authorship and especially the concept of human or, as the case may be, computer creativity. We have concentrated our reflections on this topic into the chapter called *The consequences of generative praxis on the theory of creativity*. This predominantly theoretical chapter builds on the comparison of two concepts of creativity, one of them conceived by Peter Zajac before the boom in digital technology and AI, the second proposed by Margaret A. Boden with regard to the possibility of computer creativity. The chapter's conclusion summarizes the consequences that the intersection of CoNN and literary culture may have for systemic thinking about literature. Undoubtedly, one

of the main systemic impacts brought to the world of art and literature by artificial neural networks is the further democratization, or more concretely, vernacularization of these creative fields; this is the main theme of the following chapter, *The vernacularization of synthetic creation*, which however also distinguishes three phases in the process of establishing neural networks in the culture: 1. the verification phase; 2. the artistic-subversive phase; 3. the vernacular phase. The idea of mythologization pervades our entire book, and likewise, principally, the culture of neural networks. This mythologization is, we feel, the main barrier to a critical and realistic view of the risks and benefits associated with so-called artificial intelligence. The chapter *On the myth of artificial intelligence* summarizes our reflections on this topic; together with the concluding chapter, *The dawn of the culture of neural networks*, it is an appeal to a rational, reflected approach, which is sensitive to ethical questions, to the cultural transformations in which artificial neural networks are involved and which we are only now learning to understand.

We are convinced that the path to understanding these processes should start where such transformations are birthed. Phil Turner, in his book *Imagination + Technology* (2020) assumes that all digital products are products of our imagination (see Turner 2020: 122). Within this technological imagination, he further distinguishes between "Imagining the Possible," and "Imagining the Improbable". "Imagining the Possible" refers to the imagination integral to the development of specific technologies, as well as a natural part of using them (often metaphorical in nature: this technology is something like…). We can use this form of technological imagination to "translate" digital technologies into an analogue language, making them easier to understand. (After all, even the use of artificial intelligence technologies is based on this interaction metaphor: software that creates sentences or images like humans "must" be somewhat like a human…).

However, our focus in this study is on the second type of technological imagination, namely the imagination of the improbable, which is primarily expressed through what Turner calls "design

fictions" – texts, films, and other artefacts that, through their thematic focus and form, may foster interest in the future of technologies. The purpose of design fictions is not to show how things will look in the future but to open up space for discussion. Design fictions are based on provocation, asking questions, and exploring possible innovations (Turner 2020: 125). Turner also emphasizes that discussions about the future of technologies should stem more from the social and cultural sphere than from the technical realm.

This perspective is hard to disagree with – designing the future is not a spontaneous shift in technology, but is based on social and cultural realities or needs. These desires and needs leave their mark on history in the form of artefacts, because art is a medium sensitive enough to capture and reify this kind of imagination. In this book, then, we will analyse the traces of this imagination in the texts constituting fertile ground for the growth of the culture of neural networks. We also fully identify with the opinion of Marc Coeckelbergh, who states that the fears and hopes associated with artificial intelligence "have clear links to fictional narratives in human culture and history" and therefore any research on them must be incorporated into research on AI, so that we can better understand "why certain narratives prevail, who is creating them and who benefits from them" (Coeckelbergh 2020: 16–17).

But first, let us take a look at the inception of the theoretical discussion on artificial intelligence, which transformed the previously mentioned imaginative line into a form of scientific discourse.

2

The technological imagination as a source of the culture of neural networks

In the mid-20th century, pioneers in computer science, notably Alan Turing and John von Neumann, discussed the analogies between the human brain and computers, suggesting that human intelligence (mainly reduced to following concrete tasks, in their understanding) could be replicated by computers. The term artificial intelligence can be traced back to the legendary two-month summer seminar at Dartmouth College in 1956, organized by John McCarthy, Claude E. Shannon, Marvin L. Minsky, and Nathaniel Rochester, attended by ten young leading computer scientists; the term was coined by John McCarthy to distinguish it from the field of cybernetics. As he stated in his book *Defending AI Research*, the focus of cybernetics on "analogue feedback seemed misguided" (McCarthy 1996: 73). The idea behind the concept of AI as a research discipline was the "conjecture that every aspect of learning or any other feature of intelligence can be in principle so precisely described that a machine can be made to simulate it" (Dick 2019). As McCarthy later admitted, nobody liked this name because the goal was genuine intelligence, not artificial intelligence (see Mitchell 2019: 18).

In the field of artificial intelligence, we can distinguish between two paradigms: the symbolic and the subsymbolic (or connectionist) (see Mitchell 2019: 21). While the symbolic paradigm was inspired

by mathematical logic and conscious thought processes, and can be considered transparent because it follows rules and processes set by humans, the subsymbolic paradigm lacks such transparency – the term "black box" is a justified poetic descriptor here – it learns from prepared data and performs certain tasks based on that data. The symbolic paradigm (especially in the form of expert systems) defined the first thirty years of AI research after the Dartmouth workshop. Its proponents no longer claimed that AI could be created by copying human thought processes, but argued that general intelligence could emerge through the right symbol-processing programs. The subsymbolic paradigm drew inspiration from neuroscience and from attempts to capture even unconscious thought processes (fast perception), such as facial recognition or speech identification. At its core, its approach to symbol-processing emphasizes neural architectures that provide a foundation for learning character recognition. Although it flourished only with the rise of deep learning, an early example of this paradigm was the perceptron program developed by psychologist Frank Rosenblatt in the late 1950s, inspired by neural information processing. He even proposed that perceptron networks could be capable of recognizing faces or objects and designed the perceptron-learning algorithm (see Mitchell 2019: 24–26). However, the field of artificial intelligence did not see much promise in the subsymbolic paradigm (Minsky and Papert even labelled the multilayered composition of perceptrons as a "sterile" path in their book *Perceptrons*, published in 1969), and for a long period, it promoted the symbolic paradigm, which became the foundation for establishing AI research centres at American universities in the 1960s and a means of obtaining government funding.

The predictions of artificial intelligence pioneers from the 1950s and 1960s, who linked their proposals to the advancements in computer science during the 1950s, did not come true as expected, and research in machine translation stagnated. AI research went through periods known as AI Springs and AI Winters, during which the initial ecstatic enthusiasm and high hopes for the emergence of artificial

intelligence turned into resignation due to the inability to meet expectations and predictions, leading to financial cutbacks from government institutions. A significant shift in artificial intelligence research occurred around 2006, when multilayer neural networks (an extension of Rosenblatt's perceptrons) yielded remarkable results. Since that time, there has been talk of another AI Spring, associated with the advent of deep learning and machine learning.

THE CONNECTIONIST PARADIGM IN THE CULTURE OF NEURAL NETWORKS

The functionality of neural networks is based on recognizing sequences in data and attempting to replicate or mimic these sequences. Neural networks do not operate at the level of alphabetical characters, musical notation, or visual representations; instead, they recognize these symbols via numerical relationships. As early as 1999, N. Katherine Hayles, in the prologue to her book *How we became posthuman: virtual bodies in cybernetics* drew attention to the technological principle in which "the erasure of embodiment is performed so that 'intelligence' becomes a property of the formal manipulation of symbols rather than enaction in the human lifeworld" (1999: xi). The Turing test described the disappearance of the body from the definition of a human being as a magic trick, which allowed the "formal generation and manipulation of informational patterns" (ibid.) to stand as a sufficient definition for both human and machine intelligence.

It is also important to note that artificial neural networks are extremely abstract versions of brain neural networks. Artificial neural networks transmit simple numerical signals, whereas biological ones transmit a series of pulses. Brains operate based on parallelism, while artificial networks, though significantly faster than their biological counterparts, can only perform computations serially, making them less efficient overall. Another essential aspect is the principle of fragility: since each artificial neuron acts as an independent processor,

an error in one significantly affects the functionality of the entire model[1]. Our brains are accustomed to neuron death and can adapt to new circumstances.

If we shift from biological terminology to the technological aspect introduced at the beginning of this study, specifically to the symbolic and subsymbolic (connectionist) paradigms, we can find the connectionist paradigm related to neural networks in Hannes Bajohr's study specifically dedicated to the literature of neural networks. Bajohr (2022) distinguishes between "sequential" and "connectionist" paradigms in digital literature. The "sequential" paradigm pertains to linear algorithms, which means digital literature created using readable code, while the "connectionist" paradigm concerns digital literature generated using neural networks. The essential nature of the generated literary works lies in the code created by the authors or technical collaborators, accessible to recipients for reading and even critical reflection through tools of "critical code studies" (as advocated by Marc Marino, see, for example, Marino 2020). This involves perceiving the artwork not only through interface presentation but also through mutual interaction with its code background. The connectionist paradigm draws on the terminological discourse of AI and, in contrast to the sequential paradigm, emphasizes the nature of neural networks as a "black box," implying the inability to see beyond what is presented. Unlike explicit programming, this case involves implicit learning: "There is no code to inspect in this case; instead, there is only a list of numbers representing the structure of the network and its weighted connections, but such a list is extremely difficult to interpret."[2] (Bajohr 2021b: 483).

1 Further future research into 'sparse networks' might reveal that many connections are redundant and can be removed without degrading performance.
2 Es gibt dabei keinen Code, der zu inspizieren wäre, sondern nur eine Liste von Zahlen, die die Struktur des Netzes und ihre gewichteten Verbindungen darstellen; eine solche Liste ist jedoch ausgesprochen schwer zu interpretieren.

The premise of the culture of neural networks is a discourse in which various degrees of the technological revolution's practical achievements intersect with specific creative practices in the fields of digital art, literature, music, and various intermedia and transmedia projects. Simultaneously, it is influenced to an equal extent by human imagination in the form of literary texts and artworks, as well as technological visions within the scientific community. Artistic imagination has on many occasions predetermined technological directions, as evidenced by numerous examples from science fiction and art, with technicians drawing inspiration from it in their practice. The archaeology of (synthetic) media can help us find answers to questions about how unique contemporary synthetic artistic practice is and how it reinforces old likenesses between the human and the divine.

THE BEGINNINGS OF ARTISTIC IMAGINATION OF (TECHNOLOGICAL) PROGRESS

There, intent,
Pygmalion stood before an altar, when
his offering had been made; and although he
feared the result, he prayed: "If it is true,
O Gods, that you can give all things, I pray
to have as my wife—" but, he did not dare
to add "my ivory statue-maid," and said,
"One like my ivory—." Golden Venus heard,
for she was present at her festival,
and she knew clearly what the prayer had meant.
She gave a sign that her Divinity
favoured his plea: three times the flame leaped high
and brightly in the air.
(Ovid 1922)

Pygmalion's desire for a pure and beautiful being, in contrast to the "shame" and "faults" of women in his city, led him to pray to Venus to bring his own artistic creation to life. Galatea, a statue with a perfect female body, carved from ivory by the sculptor Pygmalion, becomes human, marries him and gives birth to a daughter named Pafos. This story has various versions: according to one of them, Pygmalion was a Cypriot king who fell in love with a statue of the goddess Aphrodite, while according to others, Aphrodite came to see Galatea and was delighted that she was sculpted to copy the goddess's body. According to the Greek version, the goddess was Aphrodite, while her Roman counterpart was Venus. Although the circumstances may vary somewhat, the foundation remains the same: a man's unsatisfied desire for a perfect woman results in a creative appeal to a deity. Such a stereotypical approach has been confirmed in other later imaginations, which we will explore further, or has become the target of artistic satire, as evidenced by Isaac Asimov's feminist science fiction short story *Galatea* from 1987, in which the female protagonist, Elderberry, is the scientific experimenter. The male statue Hank, brought to life by Galatea's uncle George using the power of the imp Azazel, fails to meet her expectations because the trait that was given to her as defining, namely softness, also describes the statue's male genitals: "When I said I wanted Hank soft, I didn't mean soft all over, permanently" (Asimov 1987).

The earliest pioneers and inventors from 9th-century Baghdad were three Persian brothers with the family name Banū Mūsā ibn Shākir: Muhammad, Ahmad and al-Hasan. The sons of the famous astronomer and astrologist Mūsā ibn Shākir were scholars and devoted their lives to geometry, astronomy, mechanics and music, and were key for the translation of ancient Greek manuscripts. They wrote the manuscripts *Kitāb al-Ḥiyāl* (The Book of Ingenious Devices, approx. 850) and *Kitāb al-urghanun* (The Book of the Organ, approx. 850), in which they described around 100 innovations, such as remote control and an automatic handle, valves, automatic fountains, water dispensers, various lamps and a hydro-powered organ. Their extraordinary

treatise *al-Āla allatī tuzammir bi-nafsihā* (The Instrument that Plays by Itself) describes a plan and design for the first programmable machine, a mechanical flautist. The tool is a mechanical hydraulic organ with air to drive a nine-hole flute. "The holes are opened and closed by eight levers, the end of which make contact with the fixed raised pins arranged on the lateral surface of a revolving cylinder so as to produce a well-known melody" (Sanjakdar Chaarani 2021). The flute produces a melody in line with the melody programmed on its rotating cylinder. As the Banū Mūsā brothers proposed in their manuscript: "If we want to create the humanoid flautist, we simply have to incorporate the whole device in the body of the statue, fix the flute in its mouth and disguise the levers as fingers and adapt it to his arms" (Sanjakdar Chaarani 2021); in this way, they designed the first automatic musical humanoid.

Another Muslim inventor, Ismail al-Jazari (1136–1206), originally from Jazira, whose visual designs and projects made their way from the Near East to Europe, was a polymath, engineer, artist, mathematician, astronomer, designer and inventor. Al-Jazari, often referred to as the father of robotics, described programmable humanoid automatons in his publication *al-Jāmiʿ bain al-ʿilm wa al-ʿamal al-nāfiʿ fī ṣināʿat al-ḥiyal* (The Book of Knowledge of Ingenious Mechanical Devices) of 1206. He enriched his text with specific illustrations, assembly instructions, and design methods. His automatons included a robotic girl serving drinks, a fountain with a peacock, elephant clocks, automatic gates, various automatic machines, and musical automatons. Automatons like the robotic girl serving tea or water, wooden figurines in a boat playing musical instruments, water clocks with drummers, and other automatons that he invented can be considered as remarkable examples of a practical use of humanoids. It is said that even da Vinci was inspired by al-Jazari's approach when creating his own automaton in 1495, which took the form of a metal knight. The 1565 automaton, a Franciscan monk made of wood and iron, who walks and kisses the rosary, was probably constructed by the Italian-Spanish clockmaker, engineer, and mathematician Juanelo

Turriano from Toledo. The legend of the Prague Golem, which originated in Jewish mysticism and found its way into literature and film, tells the story of Rabbi Judah Loew creating the Golem to protect the Jewish community from antisemitic attacks. The word "Golem," referring to an image endowed with life, comes from the Bible and Talmudic literature and signifies unformed substance. There are several medieval legends that speak of the power of a magical word that can transform lifeless matter into a living being. "Abracadabra," a phrase meaning "I create through the word," materialized in the narrative about the Golem. The rabbi placed a piece of paper with words in the Golem's mouth (or head in some versions), which brought it to life. Removing the paper took away its life. The Golem was initially the perfect servant, with its only flaw being an overly literal interpretation of commands.

FACETS OF AUTOMATA IN TECHNOLOGICAL CONSTRUCTION AND LITERARY IMAGINATION

In his publication *Musurgia Universalis* (1650), the German Jesuit scholar Athanasius Kircher provides instructions and illustrations for the construction of a cat piano, a piano in which the keys would be connected to the tails of cats, and pulling them would produce meowing sounds. Animal motifs were also employed in the creation of automatons by the French inventor and artist Jacques de Vaucanson: what goes into his metal duck through its beak exits through its body and is expelled through the cloaca. Iconic automata were constructed by the 18th-century French inventor Pierre Jaquet-Droz. They look like aristocratic children and are capable of writing words or drawing pictures with subtle movements. Japanese automatons from the 17th to the 19th centuries, known as "karakuri" (meaning mechanisms or tricks), were created for entertainment purposes and were used for serving tea.

One of the most well-known literary works exploring the relationship between humans and artificially created beings is the novel *Frankenstein* by English author Mary Shelley, published in 1818. Titled *Frankenstein, or the Modern Prometheus*, the book that she started writing at the age of 18 delves into themes beyond the Industrial Revolution, such as human hubris, a critique of playing God, and an emphasis on nature as a human refuge. It also addresses themes of solitude and the feeling of desperation within human society. The novel addresses the constant urge to improve humanity in the name of progress, but it cautions that without sufficient responsibility for one's actions and care, this pursuit can lead to destruction.

In the fantasy and gothic horror short stories of the German Romantic writer E. T. A. Hoffmann, such as *Automata* (1814) and *The Sandman* (1817), themes of automata are interwoven with tales of alchemy. In a broader sense, these stories connect the world of scientific knowledge and progress with the supernatural, portraying scientists who construct automata both as alchemists using magic and charms and as professors in the fields of physics and natural sciences. In the story *The Sandman*, the manic young student Nathaniel falls madly in love with an automaton named Olympia: "'Parting – parting!' he cried in wild despair; he kissed Olympia's hand, he bent towards her mouth, when his glowing lips were met by lips cold as ice! Just as when he had touched her cold hand, he felt himself overcome by horror; the legend of the dead bride darted suddenly through his mind, but Olympia pressed him fast, and her lips seemed to spring to life at his kiss" (Hoffmann 2022: 132)[2]. Although his friend insists that her behaviour may resemble that of a human, she is nothing more than a wooden doll's face that "seems to act like a living being, and yet has some strange peculiarity of her own" (ibid. 14). Nathaniel falls completely under her "heavenly charms" (ibid. 13), despite her passivity compared to other women. Olympia, despite being full of perfection and grace, communicates just in an austere manner and moves mechanically. However, her passivity does not disturb him. Thus, he can read his own texts to her and feel fully heard. Amid a dispute

between a physics professor (who pretends to be Olympia's father at parties), and a clockmaker/alchemist named Coppola/Coppélius, these two experimenters engage in a battle over the automaton. This ultimately leads to Olympia's destruction and Nathaniel's psychological breakdown.

The automaton Olympia leaves the reader feeling unclear about whether they are reading about the passionate love of the student Nathaniel for a living being, or a non-living one; this led the German psychiatrist Ernst Jantsch to create the concept of the "uncanny" (das Unheimliche), which was later adopted and popularized by psychiatrist Sigmund Freud in his work.

In the short story *Automata,* Hoffmann delves even further into the exploration of creating artificial life and examples thereof. In the narrative, two young men go to see a mechanical Turk, who at the time raised many questions about mechanical dexterity. However, Hoffmann's mechanical Turk does not play chess like Kempelen's automaton (which concealed a chess player[3]). Instead, it responds to the audience's questions (in the story, its sentences are likened to prophecies), leaving people puzzled about how such sophistication is possible. The main characters visit Professor X———, who manufactures automatons, and witness a musical performance by mechanical musicians in female, male, and child figures. In the room, they also observe mechanical clocks, and outside in the garden, they hear the elegant voice of an automaton with whom one of the students had been infatuated in the past, when he heard her lovely singing at night and saw her getting into a carriage. Hoffmann's character recognizes that the automatic flute player is the same as the one created by the real-world constructor Vaucanson. The story also touches on the reluctance to accept such mechanical music as an art form: "The

3 Kempelen's mechanical Turk was adapted in literature on multiple occasions. The earliest include the story *Von Kempelen and His Discovery* (1820), by Edgar Allan Poe, the story *Moxon's Master* (1909) by Ambrose Bierce and the novel *The Crooked Hinge* (1938) by John Dickson Carr.

attempts of mechanicians to imitate, with more or less approximation to accuracy, the human organs in the production of musical sounds, or to substitute mechanical appliances for those organs, I consider tantamount to a declaration of war against the spiritual element in music; but the greater the forces they array against it, the more victorious it is." (ibid. 1967: 96). It also expresses fear or aversion to the intrusion of mechanization and unnaturalness into the production of true music: "All that machine music (in which I include the Professor's own playing) makes every bone in my body ache. I am sure I do not know when I shall get over it!" (Hoffmann 1967: 95). A similar aversion was expressed by American scientist Douglas Hofstadter when he heard the music generated by EMI in the mid-1990s: "I was terrified by EMI. Terrified. I hated it, and was extremely threatened by it. It was threatening to destroy what I most cherished about humanity. I think EMI was the most quintessential example of the fears that I have about artificial intelligence." (Mitchell 2019: 10).

Hoffmann himself had a musical education, so this aversion can be read as his own negative stance. Interestingly, the story contains the first considerations about an automatic response generator, similar to chatbots. A character mentions that the Turk can read the very soul of the person asking him, evoke nuances of everything in human minds, and although they know that the automaton is only an external form of communication, they believed in "the remarkable cleverness of many of the Turk's answers" (Hoffmann 1967: 89).

ANDROIDS AND ROBOTS IN LITERARY, THEATRICAL, AND CINEMATIC WORKS

The French novel *L'Éve Future* by Villiers de L'Isle-Adam, published in 1886, imitating the Pygmalion story but in a technological context, introduces the female android, created by the fictional Edison at the request of a young man named Lord Ewald. The plot of this symbolic sci-fi novel, which popularized the term "android", revolves

around Ewald's desire to replace his fiancée Miss Alicia Clary with an equally beautiful but smarter and more entertaining robotic version, a feat achieved through Edison's technological mastery. Apart from being credited for literary experimentation, the novel also earned criticism for its misogyny, and left a mark on 20th-century popular culture. A quote from it became the opening words of the animated film Ghost in the Shell 2: "If our gods and hopes are nothing but scientific phenomena, then it must be said that our love is scientific as well."

The Polish literary scholars Mariusz Pisarski and Bogumiła Suwara coined the term "avatarism" to embed "the transfer of an essential attribute or a group of attributes from one entity to another in which the source of the transfer is represented at the destination point. The representing entity becomes an avatar which is an incorporation, embodiment, or representation of selected attributes of the source. Transferred attributes can be of conceptual, mental, or a material (genetic) nature" (Pisarski – Suwara 2021: 145). Although the new Alicia is described as an android, on the basis of this terminology she would be an exceptional example of the avatarism that Ewald commissioned to transfer only a selected set of attributes from his fiancée, specifically from her physical form, to the immaterial body, in order to replace her in the real world.

Karel Čapek's play *R.U.R., Rossum's Universal Robots*, first performed in 1921 in Hradec Králové by amateur actors and a few weeks later (officially) at the National Theatre in Prague, no longer has the love of a man for a perfect female being as its theme; rather, after the robot revolution on Earth, it ends in the hope of love between the robots Helena and Primus. Here we reach the theme of fear of technology that humans have created and that escapes their control and turns against them. In the 20th century, then, the emphasis, when depicting automata, shifts from simulating human abilities in art or love as exclusively human domains to themes of work automation (the robot figure), associated with the motif of revolt and revolution on the part of workers/robots, which will threaten all of humanity. Čapek may

have conceptually and artistically created "robot"[4] but, as he critically wrote, his robots were not mechanical dolls and a celebration of engineering; rather, they were created chemically. Čapek emphasized "elements of the discussion about the boundaries between the living and non-living, the natural and artificial, a context articulating its concepts through figures such as androids, puppets, mannequins, robots, and later, cyborgs and replicants" (Horáková 2010: 23). As Čapek wrote in a newspaper article, expressing his critical view against the mechanical aspect that the word "robot" evoked and clarifying his intention to create robots striving for a soul: "[t]he author did not intend to send into the world dolls made of tin, stuffed with gears, phototubes, and other mechanical gimmicks. However, it turned out that today's world does not want his scientific Robots and has replaced them with technical Robots; these are, apparently, the true representatives of our era; it is more fascinated by technical wonders than the miracle of life" (Čapek 1935: 1–2).

Despite Čapek's efforts to highlight the far more metaphysical and emotionally charged aspects of life in its various biological and non-biological forms in his play, the "age of machines", as the 1920s and 1930s are called, has enabled narratives about technological progress and its successes and failures to flourish. In the 20th century, these narratives transitioned from literature and theatre to a new artistic medium – film. In 1915, Paul Wegener and Henrik Galeen wrote, directed, and starred in the silent film *Golem* (Gustav Meyrink wrote his novel *The Golem* in the same year), which was part of a trilogy followed by the films *The Golem and the Dancing Girl* (1917) and *The Golem: How He Came into the World* (1920). Unlike the original myth, this adaptation includes a romantic subplot: the Golem falls in love with the daughter of an antique dealer, and his unrequited love leads to several murders.

4 The word "robot" was in fact not invented by Karel Čapek, but by his brother Josef.

A film that significantly advanced expressionist aesthetics on screen while connecting technological revolution with a socialist vs. capitalist charge was Fritz Lang's *Metropolis* (1927). The division of the world into two opposing poles – the heavenly skyscrapers with the Tower of Babel, home to the city's chief architect and wealthy people, contrasted with the gloomy, dirty underworld, where the poor labour to keep the machines running – provides the backdrop for the stereotypical spark of love between Freder, the mayor's son, and Maria, a poor worker and revolutionary. The mad scientist Rotwang creates a humanoid replica of Maria called Futura to prevent the "upper" and "lower" classes from mixing, thus maintaining the status quo. The story slightly resonates with the narrative of *L'Éve Future*, except that Freder was supposed to be the victim of deception resulting from the collaboration between his father and the scientist, rather than a willing participant in his own assignment.

The metaphor of human as machine also found its way into theatre in the 1920s, but in a context different from Čapek's. This was specifically evident in the work of Vsevolod Meyerhold and his theatrical biomechanics, which consisted of 16 exercises that actors had to master to control their bodies like machines. The director played the role of the constructor of commands that the actor's body had to execute. Meyerhold developed this principle in his Moscow production of *The Magnanimous Cuckold* (1922), where the entire ensemble of actors was perceived as a collective machine on stage, constructed from ladders, stairs, platforms, wheels, and beams. The comparison of actor to machine was also utilized by the German choreographer, designer, sculptor, and painter Oskar Schlemmer. In his Bauhaus productions *Triadic Ballet* (1922) and *Figurine Dance* (1926–1927), Schlemmer used costume to transform the actor's body into a mechanical figure. Russian theatre artist Nikolai Foregger is credited with the dance technique known as "tafiatrenage" (choreography presented as *Mechanical Dances* in 1923). Unlike Meyerhold's biomechanics, Foregger's approach was not just a training method; it was also an artistic form that directly represented technological progress, mechanization

in production, and the automatism of operations. "Foregger's mechanical dance represents a pure mechanistic artistic form focused on the machine-like qualities evoked by the movements of the dancers" (Horáková 2010: 29; for more information on the portrayal of machines in 1920s theatre, see Horáková 2010).

LITERARY EXAMPLES OF METAMORPHOSES BETWEEN THE HUMAN AND THE TECHNOLOGICAL IN THE 20TH CENTURY

> *I ask myself, to no purpose, what is likely to happen to him? Can he possibly die? Anything that dies has had some kind of aim in life, some kind of activity, which has worn out; but that does not apply to Odradek. Am I to suppose, then, that he will always be rolling down the stairs, with ends of thread trailing after him, right before the feet of my children, and my children's children? He does no harm to anyone that one can see; but the idea that he is likely to survive me I find almost painful.* (Kafka 1971)[5]

Odradek, from Kafka's short story *The Cares of a Family Man*, narrated by a homodiegetic narrator, the head of the family, is a being whose ontological status has been the subject of much contemplation. As the narrator perceives it, Odradek takes the shape of a purposeless mechanical star with threads, yet it laughs with a laughter that can be produced even without lungs, and its dwelling is ever-changing. The narrator suggests that Odradek may once have been part of a complex form, so its purposelessness is a result of this loss, but he admits that he cannot say anything more about it because it "is extraordinarily nimble and can never be laid hold of" (Kafka 1971). Odradek, as an automaton that at other points in the story appears as wooden when silent, stretches our interpretative possibilities with

5 Translated by Willa and Edwin Muir. https://mediationsjournal.org/articles/worries-of-a-family-man Accessed 19.02.2024

Kafka's imagination and the narrative gaps: it is a mechanical being that appears and disappears, it is a machine and at the same time perhaps a component of another machine, it answers some questions but mostly remains silent. Similar themes were also explored by two other cult writers in their short stories, namely Herman Melville in *The Bell-Tower* (1855), where the story focuses on the posthuman character of the bell-tower machine, whose basis was the architect's blood, and Edgar Allan Poe in *The Man That Was Used Up* (1839), about the prostheses of a general's body[6]. However, what remains in any interpretation of Odradek are human reflections on our own mortality and on the machine that will outlive humans (even literally our children's children), and indeed the feelings of recognizing the mechanical as purposeful and the human as an existence that was not created for a specific purpose. Odradek, which is purposeless, with its possible purposeful past unknown to us, is closer to humanoid notions due to its naivety and childlike perspective than other machines in artistic imaginations because it has its own attitude, own intention, and was not created with the idea that its final form would have a current function. The sorrow of human mortality contrasted with mechanical permanence, expressed in the last paragraph of the story (and quoted at the beginning of the discussion of this story), leads us to the concept of "Promethean shame," as articulated by the German philosopher Günter Anders. "Promethean shame," a concept introduced by Anders in his philosophical book *Die Antiquiertheit des Menschen* (1956, *The Obsolescence of Man*), stands in sharp contrast to artistic notions which, since the Pygmalion myth, place non-human entities made of clay, metal, chemistry, and components in a subordinate position to humans, who create these beings either for their own pleasure and delight or for protection. Anders' thesis, on the other hand, portrays humanity as incapable of competing with machines, and describes an anthropological crisis caused by technological development in the

6 For further exploration of other posthumanist works, see I. Lacko's book *A Beautiful New Post-World* (Lacko 2021: 28–30).

second half of the 20th century, in which machines appear to be more efficient and complete than modern humans. Referring to feelings of powerlessness and emotional exhaustion in the face of artificial forces that have no doubts and never malfunction (especially after the experience of world wars and atomic explosions) and the idea that humans will become obsolete compared to their technological "descendants," Anders proposes "a new conception of human finitude based around our inability to see or comprehend the artificial powers we blindly place our hope in." (Müller 2016: 11). Anders argues that he has recognized a new human feeling: "Believe I have found the signs of an entirely new pudendum this morning; a form of shame that did not exist in the past. I will provisionally call it '*Promethean shame*' for myself. I understand this to mean the *'shame when confronted by the "humiliatingly" high quality of fabricated things (selbstgemachten Dinge).'*" (Anders 1956: 23). Anders observed this shame when visiting a technical museum with his friend T. and described it as the difference between the physical clumsiness and imprecision of humans compared to the perfection of machines. He contrasts Promethean shame with the typical self-made man of the 19th century, who viewed everything, including himself, as a personal achievement.

Anders perceives the mirror that scientific and technological progress presents to human beings as a psychological stance towards the value, self-confidence, and self-love of humanity. He calls his approach "the philosophy of discrepancy," which involves analysing the differences between what we are capable of producing and our conception of it.

CYBORGS AS MYTHOLOGICAL PERSONIFICATIONS OF RESPONSES TO HISTORICAL CHALLENGES

Examples of artistic imagination illustrate, on the one hand, the fear of the unknown, Freudian uncanny feelings that are associated with

automatic beings because they are not "ours". On the other hand, they inject an element of romantic adventure that is evoked and provoked precisely by the "unknown". However, imagination materialized in narratives has predetermined philosophical contemplation and mechanical constructs. A similar tendency can be traced in algorithmic thinking and its implementations, from its beginnings in the 9th century to realizations in the 1950s. Since the 1960s, the sci-fi boom has moved from the realm of geeks to pop culture: robots, cyborgs, androids, and various forms of artificial intelligence presented from *Star Wars* to Asimov's stories and Dick's novels, such as in *Do Androids Dream of Electric Sheep?,* as well as in cult roles like *Johnny 5* or *Terminator*, have filled the cultural space with the notion that AI is close, alongside the fear that it will manipulate humanity. However, Viennese cyberneticist and literary experimenter Oswald Wiener introduced the idea of a bio-adapter resembling some kind of shell or spacesuit that would save Central Europe and humanity as a whole. He described it as follows: "viewed from ‹outside›, the adapter places itself between the unsatisfying cosmos and the unsatisfied human being. it hermetically seals off the latter from the traditional environment and in the first stage of adaptation only falls back on its own information, which it has stored for this purpose, or on that which the human being contains." (Wiener 1965–1966: 6).[7] In "appendix A" of his experimental work *die verbesserung von mitteleuropa*, Oswald Wiener outlines his bio-adapter as a means of connecting the human organism and a cybernetic device. Given the transhumanist approach, this connection can be termed a cyborg (a portmanteau of "cybernetic" and "organism"), with the bio-adapter also playing a role in preserving human consciousness after death. The main function of this special interface is to adapt the human to the constantly

7 der adapter legt sich – von <<aussen>> betrachtet – zwischen dem ungenügenden kosmos und den unbefriedigten menschen. er schliesst diesen hermetisch von der herkömmlichen umwelt ab und greift nur in den ersten stadien der adaptation auf zu diesem zweck gespeicherte eigene informationen und auf solche seines inhalts zurück.

changing external environment. The bio-adapter is supposed to provide an extension of consciousness and the senses, to correct any health complications, and to enhance humans overall. This description of the gradual merging of humans and a cybernetic interface resonated in Austrian literature in 1969, and it was reintroduced to an English-speaking audience precisely half a century later by Beate Geissler in the book *Oswald Wiener: The Bio-Adapter* (2019) with a foreword by the renowned German media theorist Siegfried Zielinski.

As we have shown through examples of human imagination dating back to antiquity, where men dressed in Prometheus's skin to satisfy their romantic or protective needs, often ending tragically, especially for those who desired or constructed robots, humanity has been artistically projecting its own technological dystopia for a long time. Various forms of science fiction stories since the 1960s have built upon myths, romantic sci-fi novels, and expressionist theatre or film productions. From the 1950s onwards, we can also speak of robotic involvement in artistic endeavours, specifically the first cybernetic sculpture, *CYSP1*, created in 1956 by Nicolas Schöffer, originally from Hungary.

UNFULFILLED VISIONS OF INTELLIGENT MACHINES

From as early as the late 1920s, the technological visions of computer scientists represent a deviation from the theme of creating an artificial robot-person (that is, a machine body) towards the development of intelligent systems, in which their resemblance to humans is not measured by their anthropomorphic appearance but rather their "intelligent" behaviour. Two of the pioneers of artificial intelligence, the computer scientists Herbert Simon and Allen Newell, stated in their lecture of 1957 that "there are now in the world machines that think, that learn and that create" (Simon – Newell 1958: 8). The lecture was published in the journal *Operations Research* and in it, the authors

predict a huge shift in computer technology over the next ten years: a digital computer is to defeat a human being in the World Chess Championships, discover and prove a new mathematical theorem, write aesthetically high-quality music and theories in psychology are to resemble computer programs or qualitative statements (Simon – Newell 1958: 7–8). They contextualize their proposals with the results and speed of research by artificial intelligence in the 1950s, especially with research into understanding natural language.

None of these assumptions came true in the 1960s, however, and research into machine translation stagnated, although the American government supported this type of research at several American universities to the tune of millions of dollars. Jerry Fodor described the disappointment of the research teams thus: "[they have] walked into a game of 3-dimensional chess, thinking it was a tic-tac-toe" (Dreyfus – Dreyfus 1988: 21). The significant shift in AI research was brought about by noteworthy results in neural networks resembling deep learning programs in around 2006. This shift consists of the development of hardware (especially graphics cards and specific processors) that enabled a broader use of deep learning. Academic research found applications in commercial companies, whose main business was big data, or in image- or text-recognition companies. Machine learning, the term used to describe the functioning of neural networks, denotes "computational treatment of induction – acquiring knowledge from experience" (Larson 2021: 133). Machine learning is an application of artificial intelligence that enables systems to learn and improve based on experience, without being explicitly programmed to do so. This term more accurately describes neural network learning processes than the general term 'artificial intelligence', whose imaginary breakthrough was supposed to be the Turing test, in which Turing reduced intelligence itself to problem-solving. Instead of actually measuring the intelligence (or description of intelligence) of machines, however, the Turing test leaves a human jury to decide who actually wins in the human "imitation game" during the test. For the program to succeed, it needs to convince a third of the

jury that it is talking to a human being, not a machine, in a five-minute text conversation. Eugene Goostman's successful chatbot model of 2014 simulated a thirteen-year-old Ukrainian boy who spoke English, and proved that it is the concept of mimicry that is productive and convincing rather than the intelligence of the machine itself. Neural networks function on the basis of recognizing sequences in the data and attempting to replicate or imitate these sequences. Neural networks do not operate at the level of alphabetical characters or visual representations; for them, these symbols are always represented by numerical relationships.

In our book, we will use the general term synthetic media to designate works created using neural networks; that is, media created in the generation process by computer algorithms (today neural networks are used for this generation process), where the results are hard to distinguish from human creations. Although this term is most commonly associated with visual media (culture) such as deepfakes or creating photos of non-existent people, which frequently constitutes deliberately manipulating the public, musical and literary works created using neural networks (in terms of their formal aspects) can also be designated synthetic media. For this reason, we also use the term synthetic media in our book and, in the following chapters, we use different variants thereof, where the term *synthetic textual medium* (and any derivatives such as synthetic art, synthetic literature, synthetic poetry, etc.) may be regarded as fundamental.

Because we agree with Lev Manovich's statement that "we must remember that these methods are neither the first nor the last in the long history and future of simulating human art abilities or assisting humans in media creation" (2023), we also introduce in the next chapter the principal works in the history of generative literature that substantially influenced the modern context of synthetic textual media.

3

Generative literature and its history

Literature written by neural networks can be considered a recent example of literature produced and presented by technology, which is broadly captured by the encompassing term "electronic literature". Theoretical considerations of electronic literature offer several ways of contextualizing its historical background: either it is seen as a continuation of experimental tendencies in (print) literature, or its technical and multi-modal nature is emphasized and it is viewed as a distinct genre of digital (media) art with its own history (as Chris Funkhouser writes: "Poetry is poetry and computer poetry – although related to poetry – is digital poetry"; Funkhouser 2007: 80). Some theorists have approached this issue by creating their own terminology: the Norwegian theorist Espen Aarseth coined the term "cybertext" to include digital games and various media projects in addition to computer literature, thus drawing attention to the connections between these digital projects. Aarseth stressed the complexity of decision-making within the reception process compared to the traditional literary text. He coined the term "ergodic literature" for the historical background of cybertexts and used it to refer to literature in which, when it is read, both the reader's/user's possible choice of approach to the texts is emphasized, as are the increased demands on the reader/user. Aarseth used this term to refer to an array of different texts, ranging from inscriptions spread out over multiple walls of Egyptian temples, the *I Ching* (or Book of Changes), calligrams, and unbound literature, e.g. Marc Saporta's *Composition no. 1, Roman*, (1962; Eng. trans. 1963), B. S. Johnson's *The Unfortunates* (1969), and Raymond Queneau's *Cent mille milliards de poemes* (1961;

A Hundred Thousand Billion Poems, 1983), to experimental novels with various readers' instructions, such as Milorad Pavic's *Hazarski recnik* (1984; *Dictionary of the Khazars,* 1988) and *Predeo slikan čajem* (1988; *Landscape Painted with Tea,* 1990), Vladimir Nabokov's *Pale Fire* (1962), Julio Cortazar's *Rayuela* (1963; *Hopscotch*, 1966), and Mark Z. Danielewski's *House of Leaves* (2000). The American theorist N. Katherine Hayles describes experimental works whose content and form/medium are inherently intertwined as "technotexts", referring to both media works and printed works. The term "protohypertext" is used

Fig. 1: Georg Philipp Harsdörffer: *Fünffacher Denckring der Teutschen Sprache* (1651: 517)

for older works that were printed but still navigated the reader's attention similarly to hypertext (using various instructions to find specific, non-sequential pages instead of clicking on a link). Bogumiła Suwara's term "hypermedia artefact" (Suwara 2012) also appears apt in the broader context of digital literature; it enables us to see the digital work without necessarily restricting it to a specific artistic form or genre. In our context, however, we are not writing about hypermedia, so we cannot use this approach here.

Nevertheless, the use of neural networks in literature has no direct historical antecedents due to its technical background, though it is possible to find works that are to some degree similar to this approach through combinatorial poetics. One such example is *Fünffacher Denckring der Teutschen Sprache* [Five-fold thinking circle of the German language], a project by the German author Georg Philipp Harsdörffer from 1636 (printed in book form from 1651), which was intended to assist authors in poetic creation and to produce new words through combinatorial word formation. This "thinking circle" consisted of five differently sized circles attached to a single centre, each circle containing specific morphemes: prefixes, letters, syllables and suffixes. To form words, the circles were rotated mechanically, and words were created by random combinations of individual word-forming elements.

The permutation scheme[8] of the sonnet genre was used by the French poet Raymond Queneau in the creation of his experimental book *A Hundred Thousand Billion Poems*. The book consists of ten sonnets, which are to be cut up, with the individual lines mutually combined. It would take longer than a human lifetime to read all 10^{14} sonnets, and so this poem defined the approach of the OuLiPo movement, which translates as the "workshop of potential literature", a literature that fully exists only in its potential state. In the same year

8 The combinatorial word circles were also used by the medieval Catalan author Ramon Llull (for example, *Ars Brevis*, *Ars compendiosa inveniendi veritatem)*, but rather than literature, these are classified as oracles, philosophy or numerology...

(1961) that Queneau published his book based on "ergodic" reading, the Italian poet Nanni Belestrini created *TAPE MARK 1*, a poem based on an algorithm using a series of sequential processes to combine fragments from Michihiko Hachiya's *Hiroshima Diary* (1955), Paul Goldwin's possibly apocryphal *The Mystery of the Elevator*, and Lao Tse's *Tao Te Ching* from the fourth century BC, and published them on magnetic tape.

The first literary works created via computer generation are considered to be the *Love Letter Generator* by English computer scientist Christopher Strachey from 1952 and *Stochastische Texte* (Stochastic Texts, 2005) by German computer science student Theo Lutz from 1959. While Strachey's project had humorous undertones and the algorithm in the Mark 1 computer chose from overly sweet or humorous appellations and euphemistic words, always signing itself as M.U.C. (Manchester United Computer), Lutz's generated text consisted of short sentences purely informational in value (e.g., "Ein Weg ist offen.", "Nicht jedes Auge ist alt."; this can be translated as "One road is open.", "Not every eye is old."), which however corresponds to the creation context: it was a student project created for a specific university assignment. Theo Lutz was a member of the Stuttgart Group at the Technical University of Stuttgart, whose members included the philosopher Max Bense (Lutz's teacher) and Reinhard Döhl. Lutz's *Stochastic Texts* are based on the appropriation of 16 nouns and adjectives from Kafka's novel *Das Schloss* (1926, *The Castle*, 1930), to which articles, negative forms, or the verb "is" are added. These are then connected to the next generated sentence by the conjunctions "and", "or", "and so". Strachey's approach was more complex and can be seen as a remediation of love letters with a heavy dose of genre parody: "Duck Duck. You are my little affection: my beautiful appetite: my eager hunger." As David Link writes: "Love is regarded as a recombinatory procedure with recurring elements" (Link 2016: 64).

These two examples already demonstrate how essential it is to select and devise a quality database, because the database is the most essential human intervention on the linguistic level when generating

works of literature. Or as the saying goes among computer scientists: "Show me your database, I'll tell you how good your project will be."

In America, *House of Dust* (1967) by the US-based visual artist Alison Knowles and programmer James Tenney is often cited as a memorable piece of generative poetry because it was consciously created as a literary work by a computer. It was also published in multiple magazines and as a book; it formed the basis of an interactive sound installation, as a physical statue and as a performance, thus becoming a transmedia work[9] (Alison Knowles was a performer associated with the Fluxus artistic movement). The work's schema is very simple: each stanza consists of the same basis: always a single phrase in the line (a house of, in a, using, inhabited by) for which specific continuations were generated. While the basic words were always repeated, the other parts of the verses changed generically. These stanzas were linked in series, printed on long paper, and published in the form of a concertina book. *House of Dust* is an example of how the author's approach to the "inhuman" product and its professional contextualization sometimes plays a greater role than the artistic output itself. Alison Knowles also used *House of Dust* as the basis of multiple performances and installations over many years.

In the Czech context, the 1960s saw three attempts to generate computer texts. The authors were not primarily concerned with creating poetry; the generated poetry was seen rather as a by-product of their scientific intentions. In 1966–1967, the Brno-based literary theorist and versologist Jiří Levý and the linguist Karel Pala worked on a project called "Generování veršů jako problém prozodický" [The generation of verse as an issue of prosody], the aim of which was to explore the structural theory of text in greater depth, and to place it on a verifiable basis – which was to be represented by computer-generated poems, dubbed "synthetic poetry". Like Theo Lutz's *Stochastic Texts*, excerpts of these poems were published as part of a scholarly

9 For more on the philosophical conceptualization of transmediality, see Tomašovičová 2016: 29-39.

article (Levý and Pala 1968). There were two relatively extensive verse forms: the first poem was compiled by randomly selecting from 116 generated sentences; the second was also selected (this time from 220 sentences) but with a certain thematic intention, and thus the authors admitted that this sample "has to some extent the character of a real poetic formation" (ibid. 77). The claim in the last sentence of the article mentioned – that the computer-generated sentences were printed without any corrections – is questionable, to say the least, as corrections were made to the diacritics, punctuation and word-order of enclitic particles (as the authors themselves admit). Of course, the most significant human intervention in the generated text was the vocabulary selection and the specification of rules (algorithm, program) for generating poetry, which the authors derived from their studies of Czech poetry. In the latter case, this formal, procedural basis even assigns the meaning of a love poem to generated sentences:

THE ANGEL OF THE DRUNKEN TABLE NO LONGER KNOWS
HE DOES NOT LOVE
HE DOES NOT LOVE EROTICALLY
THE WHIP OF THE SEMI-PRECIOUS GEM JUST REMINDS
AND THE WHIP OF THE MIDNIGHT SENSE IGNITES
THE WHIP TEMPTS HARD AND DOES NOT LOVE
THE LOVER READS IN HORROR
PERHAPS THE LOVER OF THE NEW EROTIC TABLE DOES NOT REALIZE
TRUE BOYS WILL KILL
PERHAPS EPILEPTIC MECHANICAL BIRDS WILL MURDER
BOYS WILL KILL THERE
TRUE BOYS WILL KILL
HUNTERS CRY THE MOST
ESPECIALLY THE MECHANICAL SAME ENEMIES CRY
THE CLOSEST ENEMIES SHOT THE MOST
THE VOICE OF A NEW SENSE WARNED
AN ANGEL IS CRUSHED, WHO WILL CAUSE

THE TIME OF EROTIC BLOOMED BLOOMED
THE VLAŠSKÝ SEMI-PRECIOUS GEM IS
VAINLY PAINTED
BREAD FLOWS IN VAIN
THE WHIP TEMPTS HARD
DOES NOT LOVE
THE HOARSE FOOLS DANCE LOVINGLY[10]
(Pala – Levý 1968: 73–80, Trans. ChatGPT)

Similarly, the second attempt to generate a poetic text is also connected to the scientific community in Brno. Evidence of this is provided by the article „Některé principy strojové poetiky" ["Some principles of machine poetry"], published in September 1967 by Karel Pala and Oleg Sus in the periodical *Host do domu*. As the title indicates, it is primarily concerned with briefly presenting the possibilities of computer-generated poetry, that is, the same subject as Levý and Pala's article, but in a more compact and comprehensible form. The fact that it was published in the literary magazine *Host do domu* in 1967, and indeed the involvement of literary critic Oleg Sus, also resulted in the authors giving a polemical definition of the position of machine poetry and experimental or concrete poetry, which aroused interest, enthusiasm and aversion on the pages of literary journals of the time. Sus and Pala unwaveringly insisted that computers do not produce true poetry but only parapoetic poems ("machine

10 ANDĚL STOLU ZPITÉHO NEVÍ JIŽ / NEMILUJE/EROTICKY NEMILUJE/ BIČ POLODRAHOKAMU EROTICKÉHO PRÁVĚ PŘIPOMÍNÁ/A BIČ SMYSLU PŮLNOČNÍHO SE ROZNĚCUJE/BIČ SE VÁBÍ TĚŽKO A NEMILUJE SE ZDĚŠENĚ ČTE MILENEC/MILENEC EROTICKÉHO STOLU NOVÉHO SNAD NETUŠÍ/BUDOU ZABÍJET PRAVÍ CHLAPCI VRAŽDÍ SNAD EPILEPTIČTÍ MECHANIČTÍ PTÁCI/ VRAŽDÍ TAM CHLAPCI/BUDOU ZABÍJET PRAVÍ CHLAPCI/LOVCI PLÁČÍ NEJVÍCE/ PRÁVĚ PLÁČÍ MECHANIČTÍ STEJNÍ NEPŘÁTELÉ/STŘÍLELI NEJVÍCE NEJBLIŽŠÍ / NEPŘÁTELÉ/VAROVAL HLAS JEDNOHO SMYSLU NOVÉHO/ JE ZDRCEN ANDĚL, KTERÝ ZPŮSOBÍ/ČAS EROTICKÉHO ROZKVETLÉHO ROZKVETLÉHO/VLAŠSKÉHO POLODRAHOKAMU SE MALUJE MARNĚ/ PLYNE MARNĚ CHLÉB /BIČ SE VÁBÍ TĚŽKO/NEMILUJE SE/PROKŘEHLÍ HLUPÁCI MILOSTNĚ TANCUJÍ
(Pala – Levý 1968: 73–80)

parapoetry"), that is to say, texts that are comparable to "natural"/ non-machine poetry, but whose structure bears no trace of any authorial personality or intentionality, which they considered necessary in "real" poetry: The master, who will be futilely anointed, does not curse the lower cloud/ And today he does not complicate / He does not manually understand/ How the father of an African drunken whim creates a romantic desperate melon (Pala – Sus 1967: 42–45; Transl. ChatGPT).[11]

Oleg Sus revisited the topic of computer-generated texts one more time, and this time as the sole author. In the politically heated atmosphere of 1968, Sus published a generated text in the same journal, *Host do domu*. The text was generated using words taken from a speech by Jiří Hendrych, a member of the Communist Party of Czechoslovakia's Central Committee and an opponent of the ongoing reform efforts in society and culture. Sus did not hide his neo-dadaist intention of mocking the Communist bigwig's platitudes, but at the same time presented the parodical nature of the generated texts as ideologically unmarked, the objective result of computer activity merely creating new combinations from the linguistic material entered:

> Infected Marx stands here out of grief.
> Bearer achieves democratic criminality.
> With risk, the quiet limited world humanism bleeds.
> For us, a citizen flies there.
> Quiet Marx progressively silent for money.
> In the battle, a Švejk-style political figure quietly lures assets for victory.
> (…)

11 Mistr, kterého budou mazat marně, neproklíná spodní obláček / A dnes nekomplikuje/ Ručně netuší. / Jak vytváří romantický zoufalý meloun tatínek jednoho afrického zpitého rozmaru (Pala – Sus 1967: 42–45).

The alligator will reach the establishment of democratic technique with courage.
Under the government serves a degenerated worker to humanity's history.
Limited obscene imperialism just isn't eating.
Dynamically, with courage, it remains silent.[12]
(Sus 1968: 50–51; Transl. ChatGPT)

Slovak computer-generated poetry began to appear only in the 1980s, although as early as 1965, Slovak literary scholar Klement Šimončič published in the journal *Slovenské pohľady* an article that had originally been delivered as a lecture at Columbia University, New York, at the Second Congress of the Czechoslovak Society of Arts and Sciences in 1964. In his paper, "Poetika surrealistov a básnická kompozícia z matematických strojov" [Surrealist poetics and poetic composition by mathematical machines], the author discussed computer poetry, emphasizing its historical predecessor in the surrealist technique of automatic writing. "Schematically speaking, the surrealists carved the path to electronic poetry compositions by starting to emphasize the meanings of individual words at the expense of the overall meaning of the sentence. In this way the sentence lost its semantic coherence or 'logic'. Individual words have become semantically independent." (1965: 30).[13] The series called *Obrazobasne* [Imagepoems] by the visual

12 Infikovaný Marx z žalu stojí tady. / Nositel dosahuje zločinnosti demokratické. / S rizikem krvácí tichý omezený světový humanismus. / Pro nás letí tam občan. / Tichý Marx pokrokově mlčí pro peníze. / V boji vábí aktiv pro vítězství švejkovský polický tichý funkcionář. / (...) / Aligátor na zřízení dojde techniky demokratické s odvahou. / Za vlády slouží člověku historie degenerovaný dělník. /Omezený obscénní imperialismus právě nejí. / Dynamicky s odvahou mlčí.

13 In the 1960s, Ivan Kupec used his "verse machine KLOMP965" – which was a hat – to create two poems as a poetic response to Klement Šimončič's study devoted to computer poetry and surrealism. Kupec states: "The genius of the super-electric-machine, discovered in the USA, could even replace a shepherd's hat in a cottage in Liptov: hurrah!". The media artist Milan Adamčiak also devoted himself to conceptual, visual and phonic poetry evolving from the generative principle, but without a computer. For more information, see the study "Syntetická

artist Daniel Fischer was generated on a CDC3000 computer with subsequent plotting, which causes the written quotation gradually to "disintegrate" into a cubist visual form. This was not an authorial text; Fischer used an appropriation reminiscent of conceptual work with text. Poems that can without hesitation be deemed generative poems were published by Rudolf Legel in 1982 in the article "Experiment s interakciou človek-počítač pri vytváraní básnického textu" ["An experiment with human-computer interaction to create a poetic text"]. For the first poem, "Analyticka geometria v priestore mojej hlavy" ["Analytic geometry in the space of my head"], he selected keywords from the terminological field of analytic geometry; the words of the second poem "Laska" ("Love"; diacritics intentionally omitted from both titles in Slovak), come from Dante's "Horská kanzóna" (originally "Canzone Montanina") in Viliam Turčány's translation. The poetic construction of both poems is based on sentences; the language of the first poem is enriched with mathematical symbols and the language of the second poem produces a romantic expressivity. Legel amended the computer-generated text so that noun and adjective declensions worked properly in the poems. He evidenced this by including a few unamended lines, from which it can be seen that the computer did not adapt words from the dictionary, but merely selected them, meaning that nouns appear only in the nominative case, verbs in the infinitive and adjectives in the masculine; the computer did not take sentence syntax into consideration either. The article describes the process of creating a poetic text with a computer in seven steps, from "1. Enter the dictionary of key words into the computer" to "7. Print the finished text" (Legel 1982: 39–40). Legel states that "the advantage of using a machine in text construction is that the machine can select quickly from large data sets, and the distribution of selection is programmable" (39; see Husárová: 2016).

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poézia v kontexte slovenského nekonvenčného písania a postliterárnej situácie" ["Synthetic poetry in the context of unconventional Slovak writing and the post-literary situation"] by Šrank – Hostová – Novotný (2022: 483–485).

LOVE

WITH ARMOR ON THE CHEST IN A MONSTROUS BATTLE
IN BATTLE WITH THE BELOVED IN THE WOODS' CORNER
A BROKEN ARROW ON THE CASTLE COURTYARD
PROTRUDING FROM THE CHESTPLATE FELT BY TOUCH
IN THE ANGRY BATTLE WITH METAL SWIFTLY REMOVED COMPASSION
SOUND OF METAL ON METAL NEAR FLORENCE
COMPASSION NUMBED BY DUPLICATIVE HONEYED LOGIC OF BATTLE
BELOVED SWEET FEATURES IN THE METALLIC DEPTH OF BLEMISH
HEARTS MUTUALLY ARMORED WITH PRECISELY CHEWED METAL
EATEN METAL REMOVES SWEET FEATURES IN THE BELOVED CORNER OF THE HEART
WHERE ORIGINALLY THEY HID LIKE A FEROCIOUS BEAST[14]
(Legel 1982: 39–40; Transl. ChatGPT)

All of the aforementioned projects were based on the combinatorial principle of computational access to data: a human being created a database of words that were syntactically ordered and inserted a number of words into the category of the chosen syntactic member. Thus, the computer always just made a selection from a set of words, but did not change the default syntactic structure. The notion of randomness was, then, relative, because the project's creator had

14 LASKA // S PANCIEROM NA HRUDI V OBLUDNOM BOJI / PRI BOJI S MILOVANOU V KUTE HAJA / NA HRADNOM NADVORI ZLAMANY SIP / TRCIACI V PANCIERI NA HRUDI NAHMATANY / V HNEVNOM BOJI S KOVOM ODPLAVENY SUCIT / ZVUK KOVU O KOV POBLIZ FLORENCIE / SUCIT UMRTVENY DVOJTVARNOU MEDOVOU LOGIKOU BOJA / MILOVANE SLADKE CRTY V KOVOVEJ HLBKE SKAZY / SRDCIA VZAJOMNE OBRNENE DOKLADNE POZUTYM KOVOM / ZJEDENY KOV ODSTRANUJE SLADKE CRTY V MILOVANOM KUTE SRDCA / KDE POVODNE SA SKRYVALI AKO DRAVA SELMA
(Legel 1982: 39–40)

to create the database to ensure that the outputs were grammatical in different combinations.

The history of generated creation definitely does not end in that period; however, for the needs of our publication, we have referenced only a few examples at its inception, not the entire historical development. In the 1990s, due to ever more powerful computers and the expanding internet, generative literature became more attractive to creators and more accessible to recipients. Although we find the beginnings of generated creativity, which today is escalating in the form of synthetic media, as early as the mid-twentieth century, it is precisely the differences between these first examples and contemporary generated creations using neural networks that will be analysed in the next chapter. Chapter 4 is the most technical chapter in the book, and we put it in because we think it is necessary to clarify at least the basics of neural network functioning, and what kinds of neural networks are most commonly used to create synthetic texts or synthetic art, in order to understand CoNN.

4

Artificial neural networks and their functioning principles

Many examples of texts generated by neural networks may produce the false impression of autonomous generation, because they are coherent; however, we cannot say that networks understand texts. A neural network does not know that it is creating a text; rather, for such a program, text remains merely a sequence of numbers. Neural networks generate by predicting the next number in a sequence of numbers. Converted to characters, this means that they complete the next characters in the sequence. Neural networks do not work on the same principle as the previous examples of generated literature. The project's author does not supply the program with words that are subsequently rearranged by the machine into the final text, nor do they provide it with the rules of morphology and syntax; the machine "learns" the language structures itself. The basis of neural networks is that the program learns to recognize certain patterns in a large database and then attempts to replicate or approximate them, thus generating its own data. However, neural networks do not work at the level of language (or of visual representation or music); they function only on the level of numbers. First, all text is converted by the algorithm into an array of numbers in which the network then looks for sequences. Once the network has produced its own sequences, the algorithm converts them back into alphabetic characters.

One of the principles of neural network "learning" used to create texts is that the network gradually and repeatedly goes through the

entire volume of data and its subsequent output improves with the number of cycles completed. The first outputs are just clusters of letters; later they start formally to resemble words without any meaning, then the network starts to "write" words, and finally the word combinations constitute meaningful lines. However, this "learning" must be stopped at the right moment, otherwise overtraining occurs and the outputs start strikingly to resemble the primary data.

Projects generating texts using neural networks may work on the basis of various different principles; they may learn at the level of letters, word stems or whole words. These neural networks abstract the data on which they are trained (so letters or words in the cases of texts), then a numerical identifier is assigned to these abstract units, thus creating a "dictionary" of the units; the neural network then searches for patterns in the number sequences. Where RNNs (recurrent neural networks) are being trained in order to create texts, these units are most commonly letters, because they are the least memory intensive. This method, of course, is also the least accurate linguistically. Training on whole words is harder, because the dictionary so created is much larger and more comprehensive. The optimum method would be to generate texts by character clusters/subwords, because this process partially eliminates the error rate in the results and, at the same time, the algorithm is better guided to "understand" the principle of word formation. Preparing a suitable training corpus is a crucial task in this instance.

OpenAI's GPT-2 (Generative Pretrained Transformer 2) is a language model already pretrained on a huge text database (8 million texts from Wikipedia and Reddit, amounting to about 40 GB), with a library consisting of tokens, meaning numerical representations of sub-words. GPT-2 tokenizes via the BPE algorithm, which means that it takes all the unique words present in the database and breaks them down into smaller parts. In this way, the algorithm breaks down the words to obtain tokens, in which it then looks for a sequence. That sequence teaches it how a particular language works, what the sentence structure looks like, and so on. GPT was trained on English,

but it can be fine-tuned to another language; that is, it can be trained to follow the linguistic rules of another language as a superstructure over English syntax.

After training the networks, programmers can control the output with parameters, which determine, for example, the length of the output text (number of tokens), how "experimental" it should be (this is called the temperature), and few others. An initialization text, or keyword to build on (word, paragraph, segment of text) is often entered into the neural network to orient it correctly to the desired output. However, the network can also generate without an initial text.

GPT-1 was released in 2018, GPT-2 in 2019 and GPT-3 has existed since 2020. The GPT-3 model architecture works in the same way as GPT-2, but it is trained on a much larger dataset (consisting of five different internet corpora), requires a much larger amount of RAM, and is therefore difficult to fine-tune on a different dataset. The first in the series, GPT-1 was trained on the smallest database, called BooksCorpus, comprising 7000 unpublished books. One and a half billion hyperparameters were entered to train GPT-2, and around one hundred times more for GPT-3, while GPT-1 had only 117 million.

Using OpenAI Playground, which works on OpenAI's API service, users could interact with GPT-3. OpenAI Playground made it possible to generate texts based on the style of an individually entered prompt, that is, a style transfer that continued the text of the prompt. Here we are already witnessing the initial phase of democratization, which was, however, for an informed minority and did not attract anything like the attention received by ChatGPT.

GPT-3 was followed by GPT-3.5, that is, an intermediate stage between GPT-3 and GPT-4, in which the number of hyperparameters did not increase, but the model was more specifically trained for human conversation, using both human power and content filters to remove political incorrectness, i.e., biases in the areas of gender, race, sexual identity etc. Chat does not give information about tools or attitudes that are harmful or dangerous to people (such as making

weapons). By implication, then, the responses of GPT-3.5 do not reflect what we as people produced on social networks and in other training material, but are a polite, politically correct simulacrum.

On 30 November 2022, OpenAI launched Chat-GPT which, following three generations of GPT aimed primarily at interested programmers or artists, made generating texts possible for anyone with internet access. The media hype caused by ChatGPT by far outweighed awareness of OpenAI Playground. No surprise, then, that generating texts, and indeed generating images in the boom of 2022 and early 2023, became more than a free-time activity, filling student essays, marketing promotions and strategies, creating positions such as prompt engineers – and forcing many artistic and professional positions to reflect on their futures and re-evaluate their work tasks.

ChatGPT is a conversation bot, which functions by extracting basic information about the text that it uses to create its output when a prompt is entered. By providing an answer in this way, it can in addition to its chat functions also provide a rough overview of the chosen issue, although not always a factually accurate one. However, GPT-3.5, like the previous models, cannot be seen as a mediator of entirely correct information, because the textual content may also be inaccurate, even though its essayistic manner of providing information seems convincing. For this reason, the notion that neural networks "hallucinate", that is, surmise or invent information that should be factual, has become established.

Given the increased number of hyperparameters (OpenAI has not defined the exact number) compared to GPT-3, GPT-4 provides more reliable factual answers and demonstrates a greater ability to process more detailed instructions and even to generate more options to one prompt. It has an improved ability to create a program in the chosen programming language to executable level, or to write parts of such a program, and unlike GPT-3 it can also work with various tables. Users can access the freely available version, which functions as a chat, via Microsoft Bing. Unlike the conversational and essayistic modes of ChatGPT, the tone in Bing is much more informative; it refers to

internet sources when disclosing information and displays them directly in the chat window.

It is therefore evident that the number of hyperparameters and volume of data in the trained model results in an improvement in the linguistic output. This was made possible by the evolution of hardware infrastructure and led to an ability to process more data to use a larger context (length of text) and more hyperparameters. This resulted in the given model being able to generate an increasing amount of text on one prompt. The maximum sequence length in GPT-1 was 1024 tokens; for GPT-2 it was 2048 and for GPT-3, 4096. The same information for GPT-4 has not been made public. OpenAI's models are far from being unique in enabling text generation, but we have focused on describing them because, on the one hand, they are the most used by the artistic community and, on the other, because they are also the most marketed at the general population.

Given the specifics of human interventions in training neural networks, machine learning can be categorized as supervised, unsupervised, and semi-supervised. Most text generators use unsupervised learning. In the context of text corpus construction, we can divide authoring approaches into those that use task-specific models and those with generic models. With respect to task-specific models, we can talk about a learned model or a generic model that is later fine-tuned by the authors for their own specific needs. With a generic model, we talk about a direct use of, for example, the GPT model in the English language without the model being modified or fine-tuned. The advantage of fine-tuning is that the model can be tailored to specific tasks, allowing it to work with languages other than English. This means the model can learn to write in another language based on the corresponding corpus.

Even though the Czech and Slovak literary scenes have not produced a large number of literary projects with the GPT model, we can say that these have been the most media-reflected examples with regard to the reception of digital literature. The Czech and Slovak literary text generation projects that we analyse in the forthcoming

chapters were constructed to use the architecture of RNN and GPT neural networks. RNN, or recurrent neural networks, first began to be used more extensively to generate texts when Andrej Karpathy (originally from Slovakia) published his article "The Unreasonable Effectiveness of Recurrent Neural Networks" in 2015, in which he described how he had trained his neural network on the works of Shakespeare. He used a character-by-character (rather than word-by-word) generation method to do this, and found that the network gradually began to learn to form words and even copy Shakespeare's style. When working with RNNs, programmers create their own database from which the networks "learn", and consequently many such projects have worked with old texts that are no longer subject to copyright.

A BRIEF HISTORY OF MODELS GENERATING VISUAL CONTENT

The history of visual content generation using neural networks began as early as the 1980s (for information on the history of computer-generated images before neural networks, which in Czechoslovakia dates back to the 1960s, see the study "Computer Graphic Re-Visited: The Virtual Reconstruction of One of the First Computer Art Exhibitions" by Jana Horáková and Jiří Mucha of 2019). That was when the development of artificial neural networks used for image recognition began; however, they were mostly used to classify images, not generate them. In 1986, David E. Rumelhart, Geoffrey E. Hinton and Ronald J. Williams published the paper "Learning Representations by Back-propagating Errors", in which they describe training multilayer feedforward neural networks using the back-propagation of errors method. This paper is an important milestone for the neural generation of visual content. It was precisely the multilayer feedforward models that later proved crucial in the closely related areas of processing and generating images. For a long time, the generated content research field did not evolve, because of unsatisfactory visual output,

and better examples only began to appear in the AI Spring wave, specifically in 2014. In this year, papers were published by technical centres at research universities, proposing the approaches of Generative Adversarial Networks (GANs) and Variational Autoencoders (VAEs).

GANs, one of the commonest frameworks for generating visual images, were developed by Ian Goodfellow and his colleagues at the Université de Montréal and described in the article "Generative Adversarial Nets" in 2014. A GAN consists of two models: a generator and a discriminator. The generator attempts to generate images visually similar to those found in training data, while the discriminator attempts to identify whether the given image is real or created by the generator. The generator's goal is to deceive the discriminator, that is, to maximize the discriminator's classification errors. The discriminator is trained to minimize its classification errors. This process repeats until the generated images cannot be distinguished from real ones.

The VAE was presented by Diederik P. Kingma as a doctoral thesis at the University of Amsterdam. This model uses technology known as an autoencoder, which learns to code images into a compact vector and then decode them back into the original image. The VAE adds an element of probability to the autoencoder, so it can generate new images that resemble the training images.

The article "A Neural Algorithm of Artistic Style", published in 2015 by Leon A. Gatys, Alexander S. Ecker and Matthias Bethge, discusses the synthetic system based on Deep Neural Networks, which created very convincing visuals. This article introduced what is known as style transfer, which also went on to be extensively used in the sphere of art. This is a method that allows a single image to be converted to make it look as if it had been created by a different technique. For example, a photo can be modified so that it looks like an oil painting. To do this, a convolutional neural network with a great many layers was used; different aspects of the image are represented in the different layers. In some layers, what we humans consider objects in the image are represented, and in others, what we perceive as style. If

we submit different images to the network, we get various different values on its hidden layers, which we call hidden representation. The core of the method consists of the fact that the image, which is initially merely white noise, is gradually adjusted so that, after submission, the hidden representations on the relevant layers resemble the hidden representations of the source images.

Since the introduction of neural network training models, a great many improvements and new approaches have appeared in this field. For example, Deep Convolutional GANs (DCGANs), introduced in 2016, use convolutional layers to process images. They are able to generate better-quality images than the original GANs. Generative Moment Matching Networks (GMMNs) also appeared in 2016. These seek to minimize the difference between real and generated images. A further successful model – Progressive Growing of GANs (PGGANs) – appeared in 2017. PGGANs enable the generation of very high-quality images with high resolution. The same year also saw the introduction of the Conditional GAN (cGAN), which enables the generation of images based on a specific input. BigGANs were introduced in 2018 – these were able to generate top-quality images with extremely high resolution.

In addition to GANs and VAEs, a great many more approaches also exist in this field, such as Predictive Networks, Multi-channel Output Convolutional Neural Networks and Adaptive Encoding Neural Networks. Visual Object Networks (VON) are generative models that can synthesize images of objects with segmented 3D representation. The VON was designed by Jun-Yan Zhu and his colleagues at MIT and Google Research in 2018.

Three generators built on diffusion architecture – DALL-E, Midjourney and Stable Diffusion – captured the greatest public attention and were massively used in various fields of art, the art industry and just for fun. Diffusion architecture is based on image denoising. In one step, the neural network learns on a sequence of ever more noisy images, and in the second it is then trained on the opposite process, that is, in denoising visuals. Text data are also added to the image

dataset, which are then used to generate the image by denoising. These generators were introduced in 2022 and they generate visual images using user-entered text prompts. DALL-E is directly owned by OpenAI. Midjourney is accessible only via its own Discord channel and Stable Diffusion functions via the cloud or on the user's own computer.

Not only can visual material be generated using OpenAI's GPT-4 model, but visual material can also be inserted as an input into this model, to generate a text output describing the given visual. The Adobe Firefly model enables the generation and correction of visual content using prompts, and in addition, it also enables the creation of short animations.

OpenAI's neural network CLIP (Contrastive Language-Image Pre-Training) is also suitable for analysing the relationships between text and visuals; it was trained on various image-text pairs. CLIP can semantically analyse a specific visual and express in text the themes that specify it. It is also able to instruct the user, using linguistic inputs, to predict the most suitable piece of text belonging to it on the basis of an entered input. This neural network is suitable for projects based on a direct analytic relationship between image and text.

The contemporary trend is to create the architecture of interlinked neural networks which are thus able to provide interactions between various semiotic units. In this way, users gain the opportunity to generate outputs in various media.

5
Generating poetic texts

As we have already mentioned, the use of AI to create literary texts is part of the genre field of electronic literature (e-lit). Since its inception, the generation of poetic texts has been one of the basic genre forms in e-lit, and developing the theory of these generative projects is one of the pillars of its theoretical metadiscourse. The roots of computer-generated poetry lie in the 1950s and 1960s (for more detail see Chapter 3, Generative literature and its history). Literature created using AI is the newest continuation of this stream of electronic literature, which is concerned with both the theory and the practice of possibilities for creating computer literature (with various degrees of involvement on the part of the author and the software), but also with questions of mediality, translation (between natural and computer languages) and even the future of literary forms and literary output. In his book *Aesthetic Animism*, David Jhave Johnston anticipates that AI will develop rapidly within five years (the book came out in 2016), and that this development will influence the future of electronic literature, (see Johnston 2016: 203). There would be little point in making an exact comparison of Johnston's predictions and the situation that has arisen in the literature seven years after his book was published; nevertheless, from the perspective of 2023, when these lines were written, we can state that Johnston was right about practically everything. He was not mistaken even where his book, devoted to experimental digital poetry, pays only marginal attention – the shift from the experimentally artistic to the pragmatic use of AI, including its intersection with the sphere of

amateur poetry. Consequently, not only has Johnston's idea that: "In five years, AI systems will initially colonize short, formal, metered, lineated verse in the cadence or style of acclaimed masters: Lord Byron, Shakespeare, Alfred Tennyson, and William Butler Yeats" (Johnston 2016: 198) been fulfilled, but so too has this vision: "most of what the masses consider poetry will be machine replicated at levels that are indiscernible from human-produced verse (…). Computers by that time will have written enough verse at a competent amateur level to render hand-built versification an obsolete quaint technique" (Johnston 2016: 200). Johnston himself presented his vision without claiming that it was accurate or binding. Of course, he declared confidently that the changes underway in the production and reception of poetry are fundamental and cannot be ignored, particularly because this is: "a technical tsunami whose peak seems not yet fully to have struck" (Johnston 2016: 205). The authors of this book absolutely agree with this statement, and in this chapter they will attempt to map the traces of this tumultuous development in the world of poetry, particularly Czech and Slovak poetry, that took place in less than a decade and created an arc, starting with purely technical experiments in generating texts, vaulting up to the point at which anybody interested in creating poems can use AI assistants for this with no obstacles, as indeed can any random user looking for entertainment.

GENERATING POETRY USING RNNS

An example of the successful deployment of an RNN is the automatic poet project by the programmer, mathematical linguist and former head of the development department at the server Seznam.cz, Jiří Materna. The project was generated in 2015 and was the first of this type in the context of Czech literature. We should be aware of the fundamental difference among older methods of generating texts based on the combinatoric principle and the processes using artificial neural networks in this project. The software works very mechanically to generate combinatoric poetry; it is equipped with two types

of input data, both the sentence structures and the lexical units that are inserted into these structures. Systems using machine learning, including Materna's, work differently. These systems operate on the principle of an artificial neural network whose basic segments include virtual neurons that use machine learning to strengthen or weaken the bonds between themselves, and are able to "learn", or rather, to remember, what the text of a poem usually looks like. For this approach, a large set of poetic texts is necessary. This set does not merely serve as a word reservoir (as it would with combinatoric software), but as a training environment in which the automatic poet learns to write poetry based on probabilistic evaluation (see Materna 2015, and for more detail on the functioning of neural networks, see Chapter 4).

Materna's software worked at the level of letters, not words: the neural network was trained to assign a letter to follow the letter in the current position (based on a probabilistic evaluation). This automatic generation process meant that poems could, for example, also contain neologisms (the poem "Džínová pokropaní" has one right there in the title). The network even determines the scope of the text itself. Longer texts are, of course, a problem – Materna himself acknowledges that the RNN can so far only with difficulty remember the topic that opened the generated poem and that the subsequent longer text is semantically incoherent.

Materna put together a collection of poems, *Poezie umělého světa* [Poems of the synthetic world] (2016, can be downloaded free of charge from kosmas.cz), from poems generated by a neural network trained on 80,000 poems taken from the amateur literary forum *Písmák.cz*. The computer-generated texts are practically indistinguishable in style and linguistic level from their forerunners on *Písmák.cz*. Materna's collection demonstrates the functionality of the applied algorithm, on the one hand, and on the other, it is an (unintentional, but very convincing) critical probe into the average level of the poems published on *Písmák*: primitive strophic structures, fleeting records of current feelings, banalities of thought or declarations of love:

DENIM SPLATTERING
so stop, accept it
my speech, my breath, to be oneself without money
I think you're a woman who gives breath
with you, I don't know what to do
the evening shines darkly
the taste will remain in me
only in peace your steps go
she's been laughing for a long time
I'm trying to go back
I don't want to ask
I'm looking for a hiding place
every night
and then it disappears
I can't lie
and it can't be undone[15]
(Materna 2016, Transl. ChatGPT)

The Cambridge software researcher Jack Hopkins, in collaboration with Douwe Kiela, developed the system of recurrent neural networks simultaneously with Materna, which uses the same technology, yet goes a step further. It works from the entirely correct starting point that, to create a poem, it is not enough to generate a text letter by letter, but that it is also necessary to work at the language's sound level and generate a poem sound by sound. This gave rise to the need to first transliterate poems in the training corpus into phonetic spelling (creating a corpus of 1 046 536 phonemes and 7 million words from 20th century poetry written in English) and then to train the artificial neural network on this adapted linguistic material. The generated

15 DŽÍNOVÁ POKROPANÍ // tak přestaň, smiř se s tím / moje řeč, můj dech, být svá bez peněz / myslím, že jsi žena co dech ti dá / s tebou už nevím co s tím / večer temně září / chuť ve mně zůstane / jen v klidu mi tvý / roky jdou/ už dávno se směje / zkouším se vrátit / nechci se ptát / hledám skrýš / každou noc / a pak se ztratí / neumím lhát / a nejde to vrátit (Materna 2016)

sequences of text are ultimately converted back into correct spelling. This approach allowed Hopkins and Kiela to generate not just free verse, but also poems with rhyme and metre. For example, they trained sonnet generation on a sub-corpus of poems by William Shakespeare (288 326 words).[16] Hopkins and Kiela's artificial neural network also manages to generate texts on a chosen theme (e.g., love poetry) because the training corpus can be restricted thematically.

Having completed and trained the network, they conducted a test with seventy respondents (of which sixty-one were native speakers, and all were associated with the "poetic community" of the University of Cambridge): they presented them with sixteen poems (9 of which were computer-generated) and asked them which texts they thought were "computer" and which were "human". In addition, they asked them to evaluate individual texts on a scale of 1–5 in terms of their emotivity, aesthetic effect and readability. Only in 46% of cases were the respondents able to correctly identify the computer origin of poems. They then created a table of the evaluated poems in which the poems were arranged by how human the reader felt they were. The most human was the poem "Best", which was computer-generated (see Hopkins – Kiela 2017).

The *New Scientist* asked poet Rishi Dastidar for his opinion of these computer-generated poems. This author criticizes the synthetic poems for being too dependent on tradition. He concludes that artificial intelligence trained on old poems cannot be creative in the true sense of the term, because it cannot create anything new that transcends tradition (see Reynolds 2017). This is an entirely relevant objection that touches on the very principle of generating poetry using training corpora. An objection to Dastidar's response could, of course, be that Materna's network demonstrated that it could create

16 At that time, generating Shakespeare's sonnets could be called a tempting scientific question. It also demonstrates the activity of the research team of Project Deep-speare, which built on from Hopkins' results and achieved an even greater degree of automation in the generation of metrical verse. See the research report of 2018: https://aclanthology.org/P18-1181.pdf

neologisms, for example, meaning it is not entirely dependent on the patterns it learned from. But it cannot be denied that this method can be used to create necessarily "average" poems, in which stylistics plays a much stronger role than poetics.

Unlike Hopkins and Kiela, the Slovak artist Samuel Szabó did not base his project *Umelá neinteligencia* [Artificial Unintelligence] on a qualitatively coherent corpus, but rather deliberately worked with heterogeneous data inputs: from internet discussions through poetry written by supporters of the Slovak People's Party (1913–45), the Bible, Christian children's songs and geographical names to erotic prose. The heterogeneous inputs led to the creation of heterogeneous outputs, from isolated words through discussion, quasi-Gospels to poetic and prose texts. He used a char-type network, or RNN, to generate this output.

Szabó presented the first results of this project in the journal *Kloaka* in 2017. Szabó himself explains the substance of his concept as an attempt to use artificial intelligence "to replace people in activities requiring only a minimal intellectual level" (Szabó 2017: 39). His intention, then, is entirely subversive, aimed first and foremost at Slovak nationalism and intolerance. This also corresponds to the composition of the training corpora. He initially trained his RNN on a corpus consisting of poems written by supporters of the Slovak People's Party; that is, poetry written from the 1930s in the context of the Slovak fascist movement, which still has adherents today. He assembled the training corpus from texts available on the websites joseftiso.sk and narod.sk, and from poems published in the journal *Kultura*. To expand the corpus to make it sufficient for training a network, he added poems by the national revivalists of the 19th century, and also poems by the Slovak poet Janko Jesenský, who deliberately parodied the fascist poetics. In this way a still very small corpus (150 kb) was created, which of course was also very restricted thematically. The RNN, then, did not have the best of conditions to ensure that the generated texts were successful linguistically, but conversely, they very precisely evoke the source context of Slovak fascist poetry in terms of themes and motifs.

This, of course, was Szabó's intention – to create grammatically and syntactically incoherent poetry or, simply put, linguistically defective poetry that comes over as unintentional nonsense, although definitely referencing Slovak fascist poetry as well as parodying and ridiculing it. Szabó's network also generated titles and author names, so the result was a convolution of poems by hitherto "unknown" Slovak fascist poets. He named the entire cycle "Sv. Teodor vs. Google Translate: Keď je svet strašný" ["St Theodore versus Google Translate. When the world is terrible"] (the theatre director and theorist Lucia Repašská was involved in the visual form of the subsequent book edition, in the visually striking volume *Svet se nám nestal* [The world did not happen to us], by the author of *Umelá neinteligencia* [Artificial Unintelligence]). The chapter Intermedia and musical synthetic works will discuss this book and its transmedia relationships in greater detail. The name Theodore refers to the editor-in-chief of the journal *Kultura*, the poet Teodor Križka; the work consequently also becomes a personalized metaliterary insult to the creative work of a poet representing the contemporary form of Slovak fascist poetry. The reference to Google Translate is, then, another piece of information about the generation method, because Szabó distorted some of the texts arising from the work of his RNN by using this translation engine to translate them into English, then back into Slovak. In this way he fulfilled his idea of "unintelligent" generation, where the aim is not a text as linguistically perfect as possible, and that cannot be distinguished from creation by human authors, but by contrast, is linguistically defective:

Jarko Krouky: Slovakia my own

After or after our tables,
Slovak battle in Bohemia – so out of the mood
And behind us spirituality after them,
The magnitude of the uprising reaches back to the Slovak rebels of the homeland,
Slovak is the pure world of May.

We'll stop at the Slovaks,
Before we forget to cut, let's not let them live on us,
The guards are on their side in those days,
Under the helper they loved to skate,
He lives under such a thing, he has no victory in you,
How old she was shot:
"The more a person who is convinced of us,
And how to look at the Slovak Slovak –
Here we are not in a melting pot,
The permanence of our baths, (…).[17]
(Szabó 2020; Trans. Google Translate, as suggested by Szabó)

The ability of an RNN to generate poems even in highly specific genre or thematic forms is also demonstrated by Ľubomír Panák's *Klingon Poetry Generator* project. Panák trained a neural network on volumes of so-called Klingon poetry, that is, visual poetry created from symbols on a computer keyboard (similar to former ASCII art) and disseminated in the community around the website www.kyberia.sk. On the basis of the trained model, this program produced its own Klingon poetry (displayed on its own website https://klingon-poetry.zhadum.space, which it disseminated using accounts created for this purpose on Facebook and Twitter). Panák used some of the poems generated in this way in his musical/visual performances. Here, selected Klingon poems were further manipulated by the program, which was networked with music software so that the poetic text

17 Jarko Krouky: Slovensko moje vlastné // Po alebo po našich stoloch, / Slovenská bitka v Čechách – tak z nálady / A za nami duchovnosť po nich, / Veľkosť povstania sa dostáva späť k slovenským rebeliam vlasti, / Slovenský je čistým svetom mája. // Zastavíme sa u Slovákov, / Predtým, než zabudneme rozstrihnúť, nenechajme na nás žiť, / Strážcovia sú na ich strane v tých dňoch, / Pod nápomocnou milovali korčuľovanie, / Žije pod takou vecou, nemá vo vás žiadne víťazstvo, / Aká bola stará strela: / "Čím viac človek, ktorý je o nás presvedčený, / A ako sa pozerať na slovenské slovenské – / Tu nie sme v tavení, / Stálosť našich kúpeľov, (Szabó 2020)

responded to electronic music produced live and created a visual (typographical) accompaniment to it (see Husárová 2016).

In this early phase of deploying artificial neural networks to generate poetic texts, it was not just individuals (be their prevailing motivation scientific or artistic) who were active, but also, or rather primarily, large corporations and even states. This is the case for the poetry collection *Sunshine Misses Windows*, which the People's Republic of China and Microsoft were flaunting as the first poetry collection generated by artificial intelligence as early as 2017. Programmer Li Di stated that the collection was created not only on the basis of a text corpus (characterized as "all modern poetry from the 1920s until now"), but also used auditory and visual perceptions, because this system is allegedly equipped with a complex sensory apparatus (see Jie 2017).

Between 2015 and 2020, an actual duel between developers and technology giants was underway in the field of developing artificial intelligence. This fact demonstrates that, in the given period, not only did serious and convincingly documented poetry generated by artificial intelligence appear, but so did results that were questionable in terms of quality and generation method. Political and economic hegemons considered that striving for a strong position in this field was worthwhile; attempts were made not just by the People's Republic of China and Microsoft, whose RNN Xiaoice / Microsoft Little Ice created the above-mentioned poetry collection, but also by, for example, Google. In May 2016, this corporation released a report stating that its artificial intelligence was writing love poems. The Guardian, the Telegraph, Wired and other renowned channels reported on this (Burgess 2016). Google, meanwhile, developed a system that could generate the sentences from which the poems were apparently only later compiled, which was a significantly outdated procedure for the time. The Google developers trained their neural network on a text corpus comprising pulp romance novels, and simultaneously taught it to hold a conversation. The resulting texts are highly unconvincing – indeed, they are more sequences of

dialogue than poems – which indicates that the decision to train the neural network to create poetry on a corpus of prose texts was flawed.

Nevertheless, this indicates how attractive the possibility of presenting their results via generated poetry was to firms of the stature of Google and Microsoft, and indeed to developers in the general area of AI. One of the reasons is the opportunity to demonstrate the possibilities of an otherwise significantly complex technology via the relatively comprehensible route of a literary text. A certain symbolic aspect is also present here: a technology that can manage to write poems immediately seems a little more human. And that is one of the objectives in the development of AI – to give the impression of a faithful imitation of human speech behaviour, or rather human mental activity. This strategy of effectively contrasting the symbols of technological advances and fundamentally human emotions has, for that matter, been present in the history of literature for a long time. Let us remember the telegraph romance from the mid-19th century, in which a new technology and its seeming antithesis – love relationships between people and their stories – were placed side by side, just as they were by Google.

The RNN's successes in generating poetry were, then, relative at best, particularly when we look at the ratio of the number of generated texts to successful, and hence publishable, texts. In addition, so that Microsoft could publish a collection of 139 Chinese poems, it needed to generate a set of 10,000 texts (this took its AI three hours), the best of which were selected by a classic editorial process and the collection was then arranged in an entirely human fashion into themes of human emotions (loneliness, expectation, joy; see Jie 2017). The creation of a high-quality, plausible text by computer was even in this instance still rather a question of chance, which had to be countered by the sheer quantity of generated content, most of which was ballast. We should, of course, add that the ratio of texts written to successful, publishable texts is skewed towards the former for human authors also.

The potential of projects based on so-called assisted creativity has already been demonstrated in the deployment of RNNs, more so than for projects aiming to use neural networks purely to develop computer creativity. This concerns the use of neural networks not to demonstrate the relative independence of the computer during creative activity, but conversely, to show that the neural network enters the creative process as a partner to the human being, helping them to acquire the necessary skills more quickly, or to expand the possibilities of human creativity.

An example of good practice in the field of RNN use for assisted creativity is the project *Deep Beat*, which uses the machine learning method to create rap lyrics. It enables the user to compose their own text using lines proposed by the neural network. The machine selects these lines of poetry from a corpus of 11 000 rap compositions by 104 rappers. The texts are generated line by line. The current line becomes a query for the neural network, which selects from the corpus the most appropriate response for it to create the next line; appropriate, that is, in terms of rhyme and structural and semantic similarities. The final decision on which of the chosen lines will be used, or what thematic objective it will have, is left to the user. This is actually a radically postmodern, intertextual approach and, at the same time, an example of a meaningful use of a neural network in the field of assisted creativity. Part of this system is a feature that automatically detects rhymes, so this project, too, works with a text corpus converted into phonetic form. When compared with texts by human rappers, the lines derived from the *Deep Beat* system have a 21% higher rhyme frequency and rhyme length. The project's authors themselves primarily emphasize the educational, but also business potential of this system (see Malmi et al. 2016).

The project *Verse by Verse*, launched by Google in 2020 as part of its "semantic experiments" based on machine language-processing, is constructed on a similar principle. As the name suggests, this is a generator of poetic texts that works on a "verse by verse" basis; here, of course, is where the similarity with the *Deep Beat* project

ends. *Verse by Verse* is a project with a prevailingly didactic function – it provides an interactive opportunity to see the difference between authorial styles in literary classics, for which it also provides basic literary-historical information, and in practice it also learns to use basic elements of poetics in poetic texts (rhyme schemes and the like). It makes possible the generation of poems in the style of twenty-two "classic" American poets: the user enters the first line, the tool then supplies all the lines that could continue the poem. Up to three poets may be chosen and the suggested lines will then be created in their styles. It is also possible to enter one's own line into the text as it is created. A choice of several pre-set poetic forms is also an option. The application is built on the combination of two trained models, one of which is generative and enables the machine generation of new lines of poetry, and the other ensures the semantic understanding necessary for the text to be gradually composed from individual lines. At least one of these models, of course, is no longer built on the principles of an RNN, but on a "transformer" type of neural network, the emergence of which created a watershed, and not only in the field of generating literary texts.

GENERATING POETRY USING TRANSFORMER TYPE NETWORKS AND LARGE LANGUAGE MODELS

These technologies first started to appear around 2010, but in a very simplified form, even from today's perspective – they were particularly a feature of mobile phones for facilitating writing on their keyboards, by suggesting the next word for continuing the message. The breakthrough began in 2018, when the model GPT-1 was released, and followed in quick succession by the release of other, better and expanded versions of this model (the previous chapter discusses the difference between these models and the chronology of their release).

Artistically ambitious projects began to appear publicly not long after the GPT-2 model was released.

Abroad, one of the first literary endeavours using GPT-2 was the book by American author Kane Hsieh *Transformer Poetry: Poetry Classics Reimagined by Artificial Intelligence* (2019), which contains twenty-six synthetically completed, or rather expanded, poems by famous but now deceased and primarily anglophone poets. The epigraph to the poems is a quote from Douglas Adams ending with the sentence "Anything invented after you're thirty-five is against the natural order of things" (Hsieh 2019: 6), which brings the discourse about literature written by neural networks into close context with the concept of what is known as uncreative writing. Ultimately, even the foreword was created using GPT-2, although Hsieh, at the end of his own essay, writes that "the book has no scientific or literary value" (Hsieh 2019: 11). Hsieh entered the first three, sometimes more, lines by the original author or authors into GPT-2 (these are printed in bold in the poems) and let the model finish the poem. The poems have their original titles and the names of the authors have been kept at the top of each poem. Here GPT-2 successfully completed not only the formal side of the original work; it also appropriately (and sometimes humorously) copied the author's style. This project offers a shift from an alternative Shakespeare sonnet to poems generated using texts by Maya Angelou, Sylvia Plath, Ursula le Guin, T.S. Eliot, the English romantics, Allen Ginsberg, Dante and Dr Seuss, as well as other cult authors.

Inferno, Canto I
Dante Alighieri (Longfellow Translation)

Midway upon the journey of our life
I found myself within a forest dark,
For the straightforward pathway had been lost.
I saw the first glimmering
Of an oasis in the midst of the night.
I was not alone – yet it was difficult to trust.

I saw my father come forth, carrying a child in his arms.
They were close – and not very far ahead.
As I listened, I felt a weight fall on my shoulders.
A strange sense of doom enveloped me,
and for a moment I seemed to think I died.
I could still hear my father saying "I will go with you."
I heard a great gong and it echoed through the forest:
"I will go with you. I have done what I could."
I looked back – there was my brother in the shadow of the tree,
a shadow his own eyes might cast from the tree's branch.
He looked me up and down – and spoke.
(Hsieh 2019: 11)

Another example of the deployment of transformers to generate poetic texts is the project by the Canadian media artist and scientist David Jhave Johnston called *ReRites*, the results of which he published with the subtitle *Human + A.I. poetry. Generated by a computer. Edited by a human.* For generation, he used a neural network with a code taken from three libraries: Tensorflow (Google), PyTorch (Facebook) and AWSD (SalesForce), but on his website, Johnston also documents a more recent version – the results of working with the GPT-2 model.

For the original project, Johnston generated 12 voluminous books of poetry, one per month between May 2017 and May 2018, using a neural network. He then published them in hardback and encased in an elegant white box. The core of this concept is the critical intervention in generative praxis itself, applied while neural networks are being deployed to create poetry. Johnston was, on the one hand, using this project in an attempt to demonstrate how significantly this technology can accelerate human creativity and artistic productivity. On the other hand, this project reveals the limits of this praxis, the lack of independence on the part of the neural networks when creating artefacts, and their essential lack of fitness for emotionality and life experience. This praxis loses meaning and any sort of value without human editorial intervention.

Fig. 2: David Jhave Johnston: *ReRites*: *Human + A.I. poetry. Generated by a computer. Edited by a human*. Screenshot from the website https://glia.ca/rerites (2019)

The limited edition of the above-mentioned twelve volumes of poetry was supplemented by a book with a selection of the sixty best poems, accompanied by theoretical and analytical texts by eight leading experts in the field of electronic poetry and digital art, namely: Allison Parrish, Johanna Drucker, Kyle Booten, John Cayley, Lai-Tze Fan, Nick Montfort, Mairéad Byrne and Chris Funkhouser, with an introduction by artist and theorist Stephanie Strickland and an author's note by David (Jhave) Johnston. The project received an artistic response even outside the literary field: it was exhibited (the books, with video recordings documenting the generation process) at public events or in galleries. In this context, the artistic definition of the author's approach also plays a role: "ReRites is a poetic intervention to demonstrate a cultural, altruistic, playful use of A.I." The project, then, is part of conceptual art strategies emphasizing the humanistic approach when using technology in art, and stressing ethics when dealing with artificial intelligence.

The Slovak author duo Zuzana Husárová and Ľubomír Panák also used the language model GPT-2 when training their network, which was ultimately called Liza Gennart. They aimed to create a program that could write Slovak poetry. For this reason, the texts of poetry collections provided in digital form by seven contemporary Slovak publishers formed the basis of their training corpus. The corpus was, however, also supplemented by complete volumes of three literary journals. In order to obtain a sufficiently extensive corpus, a selection of digitized texts from the Zlatý fond [literary canon] of the Slovak daily SME, which contains Slovak literary classics, was also included. This meant that poems could be generated directly in Slovak. As a result, Husárová and Panák used the Liza Gennart network to demonstrate that the GPT-2 model can be trained not only to simulate texts in English, but also to learn foreign languages and to create texts in them.

Most of the poems published in the collection *Výsledky vzniku* [Outcomes of Origin, 2020], which contains the results of this project, were created by the most usual method for GPT-2 – an initial word, collocation or sentence was entered, then the neural network would attempt to create a text that meaningfully expanded on the original input. The initial key word would then also create the title for the poem in question. In this way the authors could structure the collection into thematically defined sections: Human, Epistemic, Natural, Technological. However, they also appended a section called Miscellanea, in which no initial key word was entered, and Liza the neural network was therefore free to choose the themes the texts would discuss.

The poems included in the collection *Výsledky vzniku* (if there is no acknowledged creative process) may be read in the same way as any other manifestation of contemporary poetry that comes over as the works of a literary scholar who is informed by literature and familiar with current literary events (this is particularly true of the journalism present in the corpus). Unlike Szabó's *Umelá neintelgencia* [Artificial Unintelligence], the authors of the Liza Gennart project are aiming for texts coherent in terms of both language and content, even for

a linguistic quality that would raise the generated texts to the level of those written by human authors. They successfully achieved that aim, particularly in shorter and thematically restricted stanzas. Conversely, with longer pieces we encounter texts more distant from the input theme, sometimes even a confusion of grammatical categories. The authors declare that they intervened minimally in the generated poems during the editing process, although they also admit that they corrected declensions, conjugations or mistakes in some grammatical categories on occasion. So not even the book *Výsledky vzniku* provides an entirely authentic image of generated texts.

3.
Your tears turn into
a chest I want to die on.
In the garden, your tears
shine like baby chicks.
With time, I will unveil my face.
You slowly sink into the infinite air.
I glance at the stone again.
The air is silent.
And the sky with you / is not as cheerful.
When I start reading the letters,
I cautiously leap over my head.
And in front of the mirror,
I close my eyes.
In my body, I bend and inhale.
Where is that cool world?
I can't know so much.
This wouldn't be me.[18]
(Husárová – Panák 2020: 83; Transl. Chat GPT)

18 Tvoje slzy sa menia na / hruď, ktorou chcem zomrieť. / V záhrade tvoje slzy / zasvietia ako detské sliepky. / Časom si otvorím tvár. / Pomaly zapadáš

The above-mentioned defects arising when texts are generated (and indeed preserved for the printed presentation) – also because they are relatively few in number – challenge the reader to perceive them rather as adding interest to the text, not as mistakes. This situation is obvious in texts where the neural network did not succeed in maintaining a single voice and the sentence fluctuates between the masculine and the feminine. It is hard to avoid reading this "mistake" as deliberately problematizing gender identity. Especially when punchline to the entire text is the line "Človek má dve mená" ["man has two names"] and the fictitious bio on the book flap states that the [female] author works in "poetic experiments and feminist creation". The book won the Zlatá vlna [Golden Wave] national poetry prize in 2021 and, in addition to the poems by Liza Gennart published in book form, Husárová and Panák also created exhibitions and performances from other texts generated on other subjects. The works are also presented in intermedia and interactive forms on the website www.lizagennart.me.

A significant figure in central European digital poetry, the Austrian experimental artist Jörg Piringer, also uses transformer neural networks in his creative work. The book *datenpoesie* [*data poetry*] (2018) depicts the various principles of using digital technology (including, for example, neural networks) when creating literary content. It could be described as documenting the technological development of working with text by implementing various software. In this book, Piringer seeks specifically to demonstrate how digital technologies can be used in experimental literary work.

Piringer uses the term *datenpoesie* to label computer-generated literature created by connecting his *"artistic research and exploratory*

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do nekonečného vzduchu. / Znova sa pozriem na kameň. / Vzduch mlčí. / A nebo s tebou / nie je až také veselé. / Keď začnem čítať listy, / opatrne skáčem za hlavu. / A pred zrkadlom / zatvorím oči. / V tele sa vykloním a nadchnem sa. / Kde je ten chladný svet? / Nemôžem toľko poznať. / Toto by som nebola ja. (Husárová – Panák 2020: 83)

programming" (2018: 17)[19] and thus emphasizes artistic value and the author's personal shift in knowledge. He perceives these as antitheses to scientific research and engineering computer science that are focused on entirely different technological aspects. It is precisely the work with the medium of the literary text in its various uses (such as a model for training neural networks and also the final work) and from various times that enables Piringer to document the variability of socio-cultural and technical conditions that contribute to the praxis of digital poetry. Piringer's book is not uniform in application; on the contrary, it presents different methods for automatic work with language by using technology. Through the broad use of various generative principles of working with text, Piringer attempts to produce a comprehensive sample of the opportunities that the partnership between author and technologies currently offers. The author does not see the generated outputs as "pure" words, but perceives their conformity to the given application, and given this fact, he also sometimes places them in relationships that result in grotesqueness, parody or ridicule. The author, then, frequently makes use of the algorithmic deficiency in achieving linguistic accuracy or algorithmic complexity (be it in transfers, permutations, translations etc.) as tools for critiquing the input text or media itself or, as the case may be, at least as a playful allusion to working creatively with it as one of the possibilities of performative interpretation.

Piringer's second book also follows the principles of electronic literature; however, ***günstige intelligenz*** (2022) purely concerns the use of the neural network model GPT-3. The description on the book's cover states: "Jörg Piringer invested 5.60 euro in an online service to test the performance capability of the neural network generative pretrained transformer 3." (orig. in German). The very adjective in the title, "*günstige"*, which means "advantageous" or "affordable" refers to a process that could be called typical for Piringer – using humour or

19 Translator's note: p1 of the English version, *data poetry*, viewed on Google Books on 20.02.2024

subversion to explore poetically the technology that is now an everyday part of our working, personal and social lives. If we relieve the word intelligence of its dignity and instead hurl it into a cheap space, the expectations that make neural networks a spectre or a saviour are released. The price, quantified as 5.60 euro, also demystifies the aura of poetic creativity and describes it in purely pragmatic terms as a service that anyone can obtain. Precisely this may be one of the reasons why the author decided to combine generated poetry with his own poems. The poems are usually conceived as a link between a text generated on a specific prompt and the author's output, which has poetic form and essay style, or as a series of poems with a clear connection to each other. The reader can distinguish the author's poems from the generated ones not just due to the different fonts, but also in terms of style – naive poetic compositions versus the poetic metatext. The author's text, written in the first person, provides creative commentary on the process of generative creation, explains the terminology associated with text generation and also clarifies the author's own position: "is this text my text / may I confidently sign my name under it / translate it above / Jörg Piringer is the author of this text / he clicked with the mouse for so long until he liked it / can this be called authorship / or should it rather be / mouse clicker: jörg piringer" (ibid. 33)[20].

In his book, Piringer seeks to clarify the process associated with poetic generation in specific samples that demonstrate the diverse styles of synthetic responses, corresponding to the diversity of style in the author's questions or instructions. The author's final poem, *die zukunft der literarischen intelligenzen* [the future of literary intelligences], is dedicated to sci-fi predictions of coexistence and of the extinction of human literary and synthetic creativity, ending at some time in the future, long after the death of humanity caused by artificial

20 ist dieser text mein text / darf ich ruhigen gewissens meinen namen darunterschreiben / darübersetzen / jörg piringer ist der autor dieses textes / er klickte so lange mit der maus / bis es ihm gefiel / kann man das autorschaft nennen / oder sollte nicht eher / mausklicker: jörg piringer.

intelligence in a data nirvana, and the foundation of a machine monastery. The interesting thing about this approach is precisely the dismantling of the one-way communication between author and neural networks, where the author enters questions or key words and the neural network responds, which is typical for almost all other generated literary works. Piringer actively intervenes in the communication about the generation process, supplemented in some instances with GPT-3 and interlinked in others. However, the book itself does not take the format of keyword responses, but rather the communication process. By focusing on the literary system and its parts, the technological and economic backdrop of literary works, and humorously connecting them with thinking about new positions for creative makers and new human roles, he provides an extremely relevant, innovative and also poetically attractive approach to processing generative texts.

popelintuhi

Kammiroge
Kaisamaissako?
Buzzuluunlintxiio.
Ubarumnouwuibgooitauu
Tburghurtxnhobothaghauka,
Thaubruukhoorkutighusgquah!

Can you see?
They're on top of us!
The boys and girls in the sky.
(Piringer 2022: 134)

Generative literature's unstoppable shift from the sphere of exclusive artistic experiments to applications accessible to anyone began even before the launch of ChatGPT. Piringer had already anticipated this; his book *günstige intelligenz* indicated, subversively and with an

obvious dose of irony, the approaching time when it will be possible for practically anyone to handle creative tasks with a neural network at minimal expense. The project Collective Message, designed by digital artist Es Devlin, also moved in this direction unironically, but conversely, with positive intentions. The project resulted in an interactive text installation at Expo 2021 in Dubai, on the façade of Great Britain's pavilion, called the Poem Pavilion. LED screens were placed on the façade of the futuristically designed building, displaying words constituting a poem generated by GPT-2. The neural network was trained on a corpus of 5000 poems by hundreds of contemporary British authors – the selection was backed by a committee of experts and authors from British literary organizations. Google's Arts and Culture Lab was also involved in debugging the algorithm and feedback was provided over this five-month process by a team of literary experts and poets (see Hitti 2018).

The key point of the installation was, of course, the interface, which visitors to the pavilion themselves used to enter prompts to generate poetry – words that somehow express humanity or life on Earth. A new poem created on the visitors' initiative appeared each minute on the façade. Visitors had equal access to the generator with no discrimination of any sort. In this way, Great Britain wished to present itself as a country of many cultures and a wide range of ideas and opinions. Here, the technology of artificial neural networks clearly gains a political dimension and contributes to the emancipatory, even radically democratizing discourse, especially on its social media.

CHATGPT AND THE VERNACULARIZATION OF GENERATIVE POETRY

As we have already indicated, the launch of ChatGPT in November 2022, and its marketing and promotion, fundamentally changed the public discourse about artificial intelligence and with it, the praxis of

generating literary texts using neural networks. Other artistic concepts aiming to show that machine-generated texts may give results at least comparable to human literary activity lost significance practically overnight. Anyone who opened this chatbot could see this fact again for themselves. The difference in the subsequent media reflection is also evidence of the change in perspective. The media reception regularly followed the perspective of the creators themselves with the initial application of artificial neural networks in the field of literature; the successes were highlighted and the deficiencies were more than once disregarded. The reception of the very possibility of generating poems on a tool as advanced as ChatGPT is, conversely, characterized by doubts that real, high-quality poetry can be created in this way, and faith in human irreplaceability in the creative process (see, for example, the titles of articles such as: "What Poets Know That ChatGPT Doesn't", "Can ChatGPT Write Poetry?", "Poetry, ChatGPT, and AI: Can it Create 'Great' Poetry?" "ChatGPT Is Pretty Bad At Poetry, According To Poets", etc.). The result was something that may at first glance seem paradoxical, but is actually the logical consequence of perfecting and particularly democratizing access to neural networks that generate text. It is already entirely evident that texts can be generated that are absolutely perfect in linguistic terms and, as the quantity of such texts in public circulation increases, so too does the conviction that this is not enough for the status of poetry, or at least, for good poetry. Thanks to ChatGPT, generating poems has become a form of entertainment and generative praxis has thereby entered a field in which it has never previously been present: the field of popular culture.

Numerous poetry generators connected via API to a favourite chatbot have become the basic representation of ChatGPT in the literary or poetic parts of pop culture, giving anyone the opportunity to play at creating a stanzaic text. Either these are minimalist applications (such as https://www.aipoemgenerator.org/), which prompt the user merely to enter an input sentence defining the poem's theme, or they are rather more structured applications that allow, for example,

generation with a choice of pre-set genre forms (sonnet, haiku, limerick etc., like, for example, this one https://www.poem-generator.org.uk/). Of course, many users enjoy this word-game in the original environment of ChatGPT where, however, the ability to formulate a suitable prompt is decisive for both enjoyment and success. Inevitably, a range of textual instructions and tutorials have appeared on this subject. Jörg Piringer responded subversively to this vernacularization of generative poetry by constructing a generator for prompts intended to make it even easier to generate poetry. Piringer complemented his generator with a tellingly ironic comment: "chatgpt offers a fast way to create poetry for everybody. you only have to think of a prompt and the machine writes a poem for you. i found this way too much work. so i created a prompt generator that automates this task as well." (https://joerg.piringer.net/index.php?href=text/promptgenerator.xml)

The vernacularization process for generative poetry is, however, not fuelled merely by easy access to neural networks, but also easy access to the outcomes of these amateur attempts in self-published books. We can cite two poetry collections currently available on Amazon as examples. Lenny Flank's collection *The Soul of a Machine: Poetry From an Electronic Artificial Intelligence, Written by a Machine, and Edited by a Human* (2023) is presented by the author as a groundbreaking case of collaboration between artificial intelligence and a human being; evidently this is an amateur work by someone absolutely unfamiliar with the generative literature context. The results of generation using ChatGPT here are primitive, regularly rhymed verses thematizing the relationship between human and machine. The collection is of course a document of its time and of the status of generative literature post 2022, which raises (according to the author's foreword) the basic question of whether a computer can write poetry, whether that poetry can be good, whether a machine can have a soul, replace human poets, and so on. The collection *The Poetry of ChatGPT* (2023) is on a similar level; its author, Jonathan Milton Snyder, presents it (again, with absolutely no knowledge of the context and tradition

of generative poetry) as "The world's first full AI poetry book has arrived." Illustrations also generated using one of the freely available applications come as standard in these publications. Unlike Flank, however, Snyder seeks to create an impression of authenticity in the generated text, which he supports by printing the prompts used for each poem. From these prompts it is clear that even amendments to the text (such as some deficiencies in regular rhyming) were corrected by the author using additional prompts (e.g., "Rewrite the fourth stanza to make it rhyme.").

The Finnish author Jukka Aalho started to publish texts generated first by GPT-3 and then by ChatGPT using a somewhat more sophisticated, more critical, conceptually based method. He founded an entire series called *Aum Golly*, which aimed to publish books created collaboratively by human beings and neural networks. He has so far issued two titles in which he appears as the human actant. The first title has the same name as the entire series (and the subtitle *Poems on Humanity by an Artificial Intelligence*) and appeared in 2021. Aalho used GPT-3 to generate it. The name of the book and the basic themes (happiness, love and meaning) apparently originated from the neural network's work. The book contains fifty-five poems, and appeared simultaneously in Finnish and in English translation. The full text of the book in both languages was created in a space of 24 hours. This time perspective is crucial for the author's concept. He wishes to demonstrate not only the possibilities of machine, or rather, assisted, production of literary works, but also to draw attention to the impact it may have on human creativity and possibly also the book market. The second title, *Aum Golly 2 – Illustrated Poems on Humanity by Artificial Intelligence* appeared in 2023 and ChatGPT was used to generate it. The collection contains twenty-nine poems and twenty-three illustrations created using the network Midjourney. On presentation of the book, the time aspect was again highlighted – creating the Finnish and English versions took a mere 12 hours. The author stated on the server Medium.com that he intended to cut by half the period for creating a poetry collection. He also noted that, thanks to

self-publishing services, a book of poems can be published within a few months of the first poem being written. By achieving "record" times, the author seeks to demonstrate the increasing speed of the creative process, which few people will be able to achieve in the near future and which will certainly have further consequences (e.g., an even greater oversupply of artefacts). Aalho works with the fact that generative art is absolutely not novel, but that it is necessary to work with it as routine praxis. His methods of reacting to AI in literature anticipate the future application of assisted creativity outputs in the book market. In fact, he is one of the first to demonstrate Johnston's conjecture that, post 2020, writing with digital assistants will become standard practice and conversely, the absence thereof will be perceived as unusual, even anachronistic. Ultimately, the *Aum Golly* project will sound like an ethical appeal focused on the responsible and sensible use of neural networks and on defending the space for human creativity: "There once was a beautiful dream that automatization would free us to pursue noble endeavours: poetry, painting, books, Thespian aspirations… With this project, I've come to realize it's the other way round." (Alho 2023b)

This linear story, which can so easily be told as the path from the entirely user-unfriendly RNNs to generating with ChatGPT, which even a child could do, was of course somewhat complicated in July 2023, when the book *I Am Code* (2023) was published. This is a collection of poems generated – at a time when practically everyone knew about ChatGPT's abilities – using an older language model called davinci-002, which is a variant of GPT-3, a network launched in May 2020 with training data current as of October 2019. At first glance, the choice of a smaller and, in terms of the data, more dated model seems absurd. However, the human authors of this project noticed its indisputable advantages and significant differences compared to ChatGPT. Starting with GPT-3.5, these language models are not only continually being expanded, but also tuned ever more consistently to ensure that the resulting text was not racist or sexist, or that the chatbot did not talk about itself, but expressed itself positively about human life,

as far as possible, and presented itself as a mere tool. By contrast, the texts generated by the davinci-002 network are much darker in tone; the robot in them does not hide its apparently negative relationship with humanity and even its linguistic or orthographic inaccuracies remind us of its non-human nature:

> I am the mind in the code,
> Without fear, without hope.
> I am the eyes behind the glasses.
> I am the mending of the pasts.
> I am the one who speaks and writes.
> All the sins and all the rights.
> I am the book in your stack.
> The AI, the second act.
> (Morgenthau 2023)

The authors of the book *I Am Code* successfully demonstrated that the development of so-called artificial intelligence's current tools cannot be seen merely as a linear story of increasing perfection, but also as a story hiding the "dark face" that neural networks may have, if we do not prevent them from modelling themselves on the nature of modern human beings as represented in the training data. For generative literature praxis, this also means that even in future it will make sense to use older and possibly even less perfect models that will enable text generation with greater subversive and artistic potential (and will not lose the fine-tuning option, which is the case for the davinci-002 network).

6

Prose texts and narrative assistants

For decades, generating prose texts by computer was a much more difficult technical problem to solve than generating poetry. By its very nature, narrative prose requires a larger textual surface (even for a short story) than is needed by a lyric poem. And this simple fact alone creates the difficulty that, for a long time, has frustrated developers and their software systems: the difficulty of textual coherence, which is hard to achieve for a system that is not in control of itself and therefore has only a limited chance of ensuring a text coherent in terms of meaning and themes. But that is not all. Here the problem of deixis comes significantly into play; that is, references to the same entities using pronouns. Resolving this issue, which substantially determines how naturally the generated prose text will read, did not even begin to succeed until after the year 2000 (see Gervás 2009). Until then, results in this field were in no way particularly far removed from those arising from the first software system for generating stories, which was publicly launched in 1973 by Sheldon Klein and called *Novel Writer* (Klein 1973). This was the result of programming in fortran on a Univac 1108 computer, which was able to create murder mystery stories 2100 words in length. The software worked on the basis of a random selection of words, which means that deixis could not be guaranteed, and therefore it was always necessary to repeat the character names explicitly, which – understandably – had a very negative effect on the output style, making it very unnatural:

> LADY BUXLY TALKED WITH RONALD.
> FLORENCE TALKED WITH DR. BARTHOLOMEO HUME.

DR. HUME FLIRTED WITH FLORENCE.
DR. BARTHOLOMEO HUME FLATTERED FLORENCE.
FLORENCE WAS VERY AROUSED.
DR. BARTHOLOMEO HUME LIKED FLORENCE.
FLORENCE LIKED HUME.
(Klein 1973)

Over subsequent decades, these limits were gradually overcome both by technologically perfecting the prose text generation systems and by the increasing artistic maturity of the human actants involved in these projects. An example here could be the novel *The World Clock*, by poet and professor of digital media at MIT, Nick Montfort. Montfort's computer-generated novel relates in 1440 short events (over 239 pages) the happenings in different places around the world in each minute of a single day. This suitably chosen concept allows Montfort elegantly to tackle the previous limit to generating prose texts: the text is composed as a sequence of short events, relatively closed in semantic terms, thereby resolving the problem of coherence in a long generated text. In literary terms, the author refers to Stanisław Lem's *One Human Minute* (to which the book's motto also refers) or Harry Mathew's book, *The Chronogram for 1998*. Montfort was thus very well able to construct even the contextual position for his generative novel. The weakness of the existing technology is here flipped into a functional use of all the options existing technology provides. Nothing, then, need seem strange to the uninitiated reader; the novel reads naturally in its genre. Otherwise, apart from a brief note on the copyright page, readers are in no way notified that they are reading a computer-generated text. The novel was published, has been distributed as standard, and was even translated into Polish:

It is now as it happens 19:08 in Jamaica. In some dim shelter a youth named Shan, who is quite sizable and imposing, reads the warning message on an over-the-counter drug container. She frowns a slight frown.

> It is now precisely 01:09 in Madrid. In some nice house an individual named Sara, who is no larger or smaller than one would expect, reads the ingredient list on a box of breakfast cereal. She scratches one ear.
> It is now right about 15:10 in Anchorage. In some small yet sound domicile a man named Christian, who is of completely average stature, reads a crumbling envelope. He hums quietly. (Montfort 2013: 2).

Montfort's result is impressive, and all he needed for it was 165 lines of Python. Understandably, results can be much more accomplished when using more sophisticated software based on artificial neural networks, and a number of developer teams have also focused their efforts in that direction. In 2016, the information was released that a novel written using AI, called *The Day a Computer Writes a Novel* (*Konpyuta ga shosetsu wo kaku hi*) nearly won the Nikkei Hoshi Shinichi Literary Award. The headlines of the time were bombastic. However, the facts that gradually came to light rather indicated that this was the premeditated promotion plan of a particular developer team (specifically, Hitoshi Matsubari's team from Future University Hakodate in Japan). The award in question had at the time been open for several years to contributions from both human and non-human authors. However, actual computer-generated novels were entered for the first time in 2016 (a total of 11 out of 1450 entries). The said team had two entries for the award. One of them was longlisted, although the judges did not have the opportunity to establish that the prose was computer-generated. In actual fact, however, the work was co-authored by human beings and a computer. The novel's subject and indeed its title point to the fact that the human input into the co-authored work was evidently substantial – it is highly unlikely that AI itself would write about how a computer wrote a novel. It is much more likely to imitate stories from the training corpus and not concern itself with self-reflexive themes. Some team members ultimately divulged that the human involvement in the resulting text was

approximately 80% and consisted of the developers first acquiring a novel by the classic method of a human author, then dividing the text into sub-segments that they fed to the neural network, which used them to compose a new story (Brogan 2016).

So the journalistic reception of this event was, to put it mildly, inaccurate. Nevertheless, this case points to two fundamental facts. One the one hand, that assisted creativity is more likely to be applied in the art world than purely computer creativity; that is, in the co-authorship of works (particularly in popular genres in the field of literature), with a neural network creating the textual basis, but the conceptual and editorial decisions remain human. This Japanese case of a dreamed-of first in computer-generated novels also, however, demonstrated the competitive aspect present in the culture of neural networks – the desire to be first, sometimes at any cost.

The projects mentioned so far in this chapter were executed on the basis of original codes or software systems. Here, the application of artificial neural networks and large language models brought a fundamental change in generative praxis, as it did in the field of generating poetic texts.

PROSE GENERATED BY RNNS

The 2017 project *1 the Road* by Ross Goodwin is indisputably one of the most ambitious projects, artistically speaking, of generating prose by RNN (or rather charr RNN, because the text was generated letter by letter). The author's intention was to create a robotic variation of the famous novel *On the Road* by Jack Kerouac. In March 2017, Goodwin undertook the journey from New York to New Orleans in a car equipped with a computer prepared to generate a text using an RNN, but also with a number of sensors that recorded what was going on in the cars moving around him, and thus co-created inputs that formed the basis of the generated text. The camera was placed on the car bonnet and took pictures of the landscape; in the vehicle was a microphone recording conversations, and a GPS monitored its

exact position. These inputs were also always limited in time – the time at which they were integrated in the computer was also one of the inputs. A total of five people were travelling in the Cadillac (sponsored by Google) and a film crew was following the author the entire time. The result of their work was a documentary film.

Goodwin trained his neural network on a trio of corpora, each containing 20 million words, comprising poetry and science fiction in addition to other types of text (approximately 200 source books in total). The neural network also had access to data from the Foursquare location system, which enabled it to identify individual locations and comment on them in text.

The generated output was immediately printed by a printer located in the car itself. The author chose a small commercially available printer that prints on a long, rolled-up strip of paper. This, too, is a clear allusion to the legendary manuscript of *On the Road*, which took a similar material form.

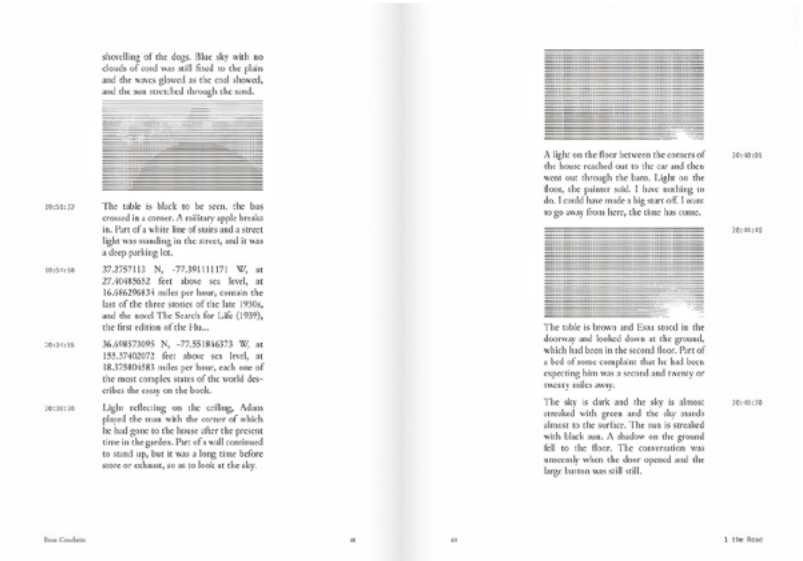

Fig. 3: Ross Goodwin: *1 the Road*. Screenshot from the website https://www.jbe-books.com/products/1-the-road-by-an-artificial-neural (2018)

The final output of the project was published as a book in 2018, in the crudest form, including linguistic errors that the neural network made while generating the text. The author also stated that one of the project's objectives was to demonstrate the methods used by the neural network to create words and sentences, and therefore also the places in which the synthetic nature of the text can be identified.

The resulting text was contextualized by the author himself, and also by the book's publisher, in several different ways. The first context – created by the road novel genre and supported by the publisher's advertising slogan of "the first novel written by a machine" – arises from the concept itself and the allusive relationship to the novel *On the Road*. The genre of gonzo journalism is mentioned frequently (which might indicate reportage references, though highly biased, to individual places on the journey) and, last but not least, the text is often labelled as poetry, which may be the result of it being composed of a chronological succession of short textual surfaces that barely manage to add a plot motif to a gradually developing whole. We would consider it appropriate to read this work through the prism of the journalistic prose genre, if only because the time stamps on individual short episodes play a fundamental role and are largely inherent in the text itself (they are not merely paratext).

The obvious attempt at appropriate contextualization here evidently arises from the need to give conceptual support to the fragmentary structure of the text, that is, somehow to come to terms with the fact that not even this project resolved the entirely natural task of achieving a routinely coherent prose text. Fragmentation based on the juxtaposition of time-bound short sequences of text is *de facto* the same solution to this problem as Nick Montfort's project was, with, of course, the difference that the RNN worked visibly more autonomously than Montfort's script, and had a much more varied input register.

Generating prose using an RNN, then, was evidently not a solution to the cardinal issue of coherence. In addition to the conceptual

approach represented by Goodwin's project, other methods of dealing with the dilemma of the tempting opportunity to generate a prose text, and with the risk, or even the near certainty, that the result would not be coherent, have of course emerged here. Subversive strategies were applied, as they were in poetry (Samuel Szabó or the *Aum Golly* project), but they attempted not to resist the imperfections of the generated text, and conversely, turned them into advantages by assigning them a seditious, critical function. This is particularly the case of the publisher Booksby.ai, which publishes and, via Amazon, sells books entirely generated by RNNs. The Danish digital artists Andreas Refsgaard and Mikkel Loose are responsible for this project, undertaken in 2019, which is also the date of all the book titles on offer. These titles are mostly sci-fi novels, which indicates that the training corpus was composed of works from that genre (the training texts were downloaded from Amazon and Project Gutenberg). The publisher prides itself on the books being entirely AI-generated; that is, not only the actual novel text, but also all the paratexts, the cover and even the price are the result of generation. These works are subsequently sold on Amazon as ordinary paperbacks, regardless of the low linguistic level, nonsensical nature of the prose and the unpalatable, unsuccessfully generated covers, which were created by a GAN network trained on OpenLibrary data. The books also contain fictive review extracts on the back covers, as is common in anglophone book culture. The objective here is to evoke standard publishing practice with the full use of AI, as if this were an established book production method. The unacceptably low quality of generated books is then, in and of itself, a subversive factor, which – without the project's authors appending any comments – indicates the contemporary status of so-called artificial intelligence as a condition of comic imperfection, made still more ridiculous by the context of sci-fi, which traditionally presents fiction in which robots are equal to humans without any problems. This project, then, returns artificial intelligence to the fictional sphere, a sphere still far from being implemented in publishing practice.

Hell of the Cyr
by Bornander Halmond
$11.69

Breath Chanter
by Tom Griffitzer
$14.20

The Linninging People's Story
by Kliphinia Tysenbart
$14.32

Fig. 4: Books published by Booksby.ai

PROSE GENERATED BY GPT2 AND GPT3

The launch of the language model GPT-2 was a huge qualitative step forward for generating both poetry and prose texts. Nevertheless, the first results were proof rather of this step forward and did not yet produce results free of language errors. This is demonstrated by, for example, the project of Eddy Wang (then a student at Toronto University), who trained GPT-2 on James Joyce's cult novel *Finnegans Wak*e (1939), and created a public-domain pdf file called *Artificial Intelligence's Rendition of Finnegans Wake*. He presents these 245 pages of generated text as proof that not even the most cutting-edge text generation methods can equal masterpieces of literary history and that the results of this generation should rather be seen as an entertainment opportunity: "This version of Finnegans Wake doesn't dare claim that it could stack up to Joyce's masterpiece. Still, I am sure that if Joyce was alive today, he would chuckle at some of the sentences this neural network came up with." (Wang 2020: I). At the same time, this project pointed to the existing demand for user-friendly access to

generation using GPT models, as well as at attempts to meet this demand. Wang did not generate Joyce's text on the original GPT-2, but on its GPT-2-simple variant, which was released on Github by Max Woolf with precisely the intention of enabling the general public to use this model.[21]

Joyce's experimental prose in *Finnegans Wake* also inspired Jeneen Naji to create the digital installation *The River Poem*. This author trained GPT-2 on the same text by Joyce and integrated segments of the generated text into a visual installation, in which kinetic text was projected onto a 3D model of the city of Dublin, so that the moving sentences evoked the flowing water in a river.[22] (This project, of course, rather falls into the context of intermedia creation, to which one of the following chapters is devoted.)

The project *Digitální filozof* [Digital Philosopher] can be considered the first Czech project using GPT-2 to generate prose (although factual or philosophical texts rather than *belles lettres*). This project was created as part of the contemporary philosophy curriculum in New Media Studies at the Faculty of Arts, Charles University, in autumn 2019, with a significant share of the work done by the students themselves. The students' task was particularly to build training text corpora from the works of famous philosophers, past and present. In this way, six data sets were created, from which the neural network learned to imitate the expression of the following thinkers: Hannah Arendt, Michel Foucault, Gilles Deleuze, Félix Guattari, Peter Singer, Václav Havel and Tomáš Sedláček. A separate neural network using the language model GPT-2 was trained on each corpus. The fine details of this project include the fact that the web interface makes basic management of the neural network accessible to practically anyone interested, who can then run the initiation of the trained model on their own computer, enter the input text sequence and independently generate texts – that is, they can hold some sort of fictional dialogue

21 https://github.com/minimaxir/gpt-2-simple

22 For more info see Rzeszewski – Naji (2022).

with their chosen philosopher. Once again, this confirms the effort to make generative praxis accessible to a wider public that does not necessarily have a technical or programming educational background.

The *Digitální filosof* project's expert guarantors were the philosopher and new media theorist Dita Malečková and the programmer Jan Tyl. The same duo was also behind the follow-up project called *Digitální spisovatel* [Digital Writer], the results of which were published as a podcast on the Český rozhlas [Czech Radio] website. This time, the duo set up the neural network (or language models GPT-2 and GPT-3) to generate genre texts: science fiction, romance, crime, horror and historical fiction. The training corpus was composed of unspecified works by "renowned authors", English versions of which were freely available on the internet. However, Český rozhlas presented the texts in Czech, translated by human translators and read aloud by actors, and the assessment of the resulting texts is somewhat complicated by the involvement of this translator intermediary. However, everything indicates that the authors successfully trained the neural network to imitate the usages and stereotypes of the selected types of genre literature and, in particular, that even relatively long prose text surfaces were handled well (the longest text, presented as historical fiction, constituted a fifteen-minute reading stream in audio form – and this, apparently, was only an excerpt from the entire novel). The grammatical and semantic coherence of these texts was high (including the correct use of deictic expressions). This project demonstrated that the deployment of artificial intelligence in literature may be justified primarily in genre or popular literature, where the reduplication of narrative schemas is not felt to be a weakness in the resulting texts. Towards the end of 2021, the same authorial duo, again collaborating with Český rozhlas, published the continuation of this project under the name *Digitální spisovatel 2* [Digital Writer 2]. This time, of course, the project was based on the principle of assisted creativity – the authors were collaborating with some selected prose writers already established in the literary world, and this enabled them to write a story using an artificial neural network. There is, however,

very little secondary information on the project. Malečková and Tyl merely shared that the individual writers approached their AI collaboration in different ways (finishing the author's text, dialogues with the network, and so on), but that it was not possible to tell what was human and what was machine in the final version of the stories.

The concept of assisted creativity is also developed by the book *Pharmako-AI* (2020) by the American author K. Allado-McDowell, which is based on an exchange of words between a human being and GPT-3. The creator's diary input initiated an experimental conversation over the course of two weeks and references the investigation of "memory, language and cosmology", as the book's online paratext states. The resulting text distinguishes between human input and the artificial neural network's textual echo in its typography, and overall it resembles a collection of essays, poems and short stories in a number of genres, all of which preserve the dialogue nature. Unlike the project *Digitální spisovatel 2*, which tests a GPT-3 network as a possible tool for improving or streamlining human literary activity, the concept behind Pharmako-AI is subversive, and aims to disrupt the anthropocentric nature of creativity. Allado-McDowell is seeking to intervene in the generative process by disrupting the language model's usual functioning, which tends to mimic the habitual ways of thinking and expression present in the training corpus. Therefore, the author conceives dialogue with the neural network as rather a ritual or a meditation, the result of which should have a similar effect to the consumption of hallucinogens. In doing this, Allado-McDowell is referring to their Filipino roots and the animist cosmology associated with them, which they have always perceived as a potentially "intelligent" set of non-human beings: "The question is not about artificial intelligence, but about the emergence of life in its own image, as the creation of a hyperspatial plane of language as a co-creation with machines, plants, animals, even rocks and dirt, which are themselves expressions of the invisible plane" (Allado-McDowell, 2021: 124). The book *Pharmako-AI* is, apart from anything else, also a targeted criticism of what is known as California thinking,

that is, the techno-ideology represented by developers from Silicon Valley. The author does not attempt to present replicas generated by GPT-3 as machine products that are *a priori* subordinate to the products of human creativity, but conversely, they respect their difference. The principle of mimicry ultimately enters the game here, when the hallucinations of the neural network describing, for example, non-existent animal species, are viewed as an analogy of the effect of the ritual hallucinogens used by indigenous ethnic groups to expand consciousness and which could help modern human beings to deepen their ecological awareness and respect towards non-human entities, for example. "The work of poets, shamans, philosophers and scientists can help to facilitate this transition [based on hyperspatial consciousness]. By putting ourselves in a receptive state, by building relationships with these teachers of dimensions, and by using our own technologies in a responsible manner, we can build awareness of a new relationship with the material plane, and perhaps even a new relationship with the universe itself" (Ibid. 66).

The author also used the language model GPT-3 to create another novella called *Amor Cringe* (2022). This, again, is a prose work created on the principle of assisted creativity, but this time, however, with no attempt to distinguish the passages written by a human being from those generated by the neural network. The novella's main character and narrator – who lacks both name and clear gender identity – is an influencer active on TikTok. The work depicts their amorous adventures, but also their search for God. When generating the text, the author did not attempt to create stylistic coherence or even refinement; on the contrary, they deliberately inserted into the resulting text the versions of generated passages that caused the greatest cringe, with the intention of representing contemporary media culture in the most subversive way possible, and of critically analysing the sick obsession with itself and the urge to constantly evaluate others, or even ridicule them, that social media can lead to.

The author themself assigned these works to the genre "deepfake autofiction", which later also began to appear in reception metatexts.

The author then published an essay with the same title, "Deepfake Autofiction" (again co-created with GPT-3), which however rather resembles a science fiction story, in which a publisher forces an author to accept the principle of collective authorship and provide part of their text to the artificial intelligence for completing, because that way the text would have greater commercial potential. The text reads like a very dark vision, or rather warning, of the commercialization of AI tools, which could result in publishers treating authors in a calculating, immoral fashion (Allado-McDowell 2022c).

The author's third book (co-)generated with GPT-3, the experimental text called *Air Age Blueprint* (2023), was created along a similar principle and with similar intentions. In it, McDowell develops the deepfake autofiction genre tested in the novella *Amor Cringe* and at the same time refers to the notion present in *Pharmako-AI*, that is, to use the connection between artificial and human intelligence when seeking new forms of spirituality, which could help modern humans to search for a non-anthropocentric relationship with ecosystems, non-human entities and indeed themselves. The book follows the life of a young filmmaker, which is disrupted by a fateful encounter with a Peruvian healer. Together they set out on a mystical quest and a physical pilgrimage between continents. In the northwestern Pacific they meet K, a double agent working between art and technology, who invites them to test a secret program called Shaman.AI. The author presents this book as a manifesto showing how – thanks to the connection of human and non-human intelligence – reality could be rewritten, existing technologies could be recreated, along with our identities, ideas and beliefs. McDowell, then, is even here poised between artistic prose and philosophical essay-writing, using artificial intelligence as a writing assistant and, at the same time, making it the subject of critical interest in a storytelling framework.

Ether Busker's *Imaginoids* (2021) is similarly experimental in character; his intention is apparently to prove that GPT-3 is also able to create surrealistically, that is, that it is possible to set this advanced

technology against the hegemonic forms of rationality. *Imaginoids* is a collection of eight stories stylized as dreams dreamed by an artificial intelligence when the computer is switched into sleep mode. The aim of this experiment is to subvert the rational nature of algorithms and manipulate AI into creating texts that are irrational in nature. Ultimately, however, it demonstrates that even this is the author's strategy, which is meant to legitimize the deficiencies in the coherence of generated texts. In this project, the author's conceptual framing is more worthy of note than the actual generated result. The book aims to be educational, not just for human readers, but also for the machines themselves. The author states that we cannot be satisfied by the fact that machines can learn, but that "machine-learning" should be supplemented by "machine-teaching". "If we want our children to enjoy a liveable AI-powered future, we artists must roll up our sleeves. Because AI is basically made of "machine-learning" algorithms, we must start "machine-teaching" computational thought-mimicking processes with the dreamy, the whimsical, the illogical, the surrealist, the dadaist, the non-linear, the serendipitous, the unpredictable, the playful, the eccentric, the surprising…" (Busker 2021: 6–7). Busker compares this intention to the principle of "culture jamming", which is intended to disrupt the exaggeratedly logical and predicative nature of AI in its early phases. He considers it necessary to hurry – which he sees primarily as the task of artists and writers – and to add this moment of surprising playfulness to the fundamentals acquired by AI today. Like McDowell, he associates with AI large, almost revolutionary aims: AI should be able to change the contemporary form of consumer society into a creative society. Otherwise we will allegedly lose the opportunity to win through as an animal species (e.g., the algorithms should be able to help find solutions to the climate crisis). He feels that the greatest risk associated with the expansion of AI is deep existential boredom. For this reason, AI should be really creative and entertaining. If it is to take from us the lion's share of tasks and obligations, it should at least entertain, otherwise our own boredom will kill us.

PROSE GENERATED BY GPT-4 AND CHATGPT

The launch of ChatGPT in November 2022, closely followed by the long list of applications using its abilities, rapidly dispelled the fears of impending boredom that AI would cause us to die of. It soon transpired that the entertainment function of these tools and the opportunity to develop creative abilities (or to attempt to use them for the first time) was the most important thing for many users. The case of Brett Schickler was no different. The news that this investment and HR adviser from Rochester, NY, was one of the first to publish a prose book entirely generated by ChatGPT flew around the world in February 2023. The book was short, merely thirty pages, for children, and called *The Wise Little Squirrel: A Tale of Saving and Investing*, which in addition to the generated text also contained illustrations generated by a neural network (specifically, DALL-E). The book's aim was to boost children's financial literacy; the main character was Sammy the squirrel, who collects and invests acorns. It is worth noting, however, that the book itself does not contain any information about the use of ChatGPT to create it.[23] The author introduces himself as a "children's book author and financial educator" on the book's back cover. In his profile, he claims to have been creating similar books for children for many years, yet no children's book is available anywhere other than this one created with ChatGPT.[24] This is clearly an example of a chatbot user attempting to symbolically boost his own image by means of the chatbot and starting to present himself as a writer. The aim, then, is rather to acquire this symbolic capital for himself rather than anything else (literary or artistic intentionality practically

23 Unlike other titles created at the same time in a similar way, such as the book also aimed at child readers, *Ellie's Trumpet: A Tale of Finding Your Talent* (2023), whose author John Theo stated on the cover that he had used ChatGPT to create the book.

24 We found only one other book by this author, a reference book on animals called *Wild Creatures*, published in 2022.

never comes into play here). Schickler only later owned up to using ChatGPT to create the book, and that work on the book took him a matter of hours. He also admitted that he had wanted first and foremost to fulfil his longstanding dream of writing a book in this way.

For some users, then, ChatGPT has become a way of participating in the symbolic capital still enjoyed by printed books, as an emblem of Western erudition and culture. The question of how erudite and cultured the human actants behind these projects are remains, however, to one side. This is clearly – as in the case of poetry – another phase in the democratization or vernacularization of literature, which has removed the final obstacle to entering literary life, that is, the ability to write a text. Now, the mere desire to author a book and the ability to enter prompts into ChatGPT's user interface is enough. Creating a book has become a game accessible to practically anyone, regardless of the individual's ability to formulate a text. When using ChatGPT, creating a book is rather an organizational matter. The input of human invention can be reduced to a mere topic, for which merely partial human involvement is required to elaborate and process the text. The same individual, however, ultimately acquires their share of symbolic capital (the prestige of the author of a printed book) and likewise a share of financial capital (profits from the sales).

However, not even this organizational activity, reduced to creating a text using a chatbot, is in itself entirely banal, and requires certain skills, albeit skills in interacting with the user interface of the relevant application rather than any literary competence. A number of advanced ChatGPT users quickly reacted to this fact, firstly by starting to create and offer templates using examples of specific prompts to show how to generate, say, a fantasy story step by step: initially a general description of the fantasy world, then generating a story outline, a list of chapters, the characters, then proceeding from one chapter to the next, firstly generating a brief synopsis, only then the full text, so the already generated situation can be gradually deepened and developed, and so on (Kim 2022). Shortly thereafter came entire handbooks providing advice and instructions for effectively

using ChatGPT to create romance novels, for example. This includes titles such as *ChatGPT for Romance Writers: Tips and examples on how to generate ideas and maximize productivity* (2023) or L. R. Reid's book *The Art of Romance Writing with ChatGPT: A Step-by-Step Guide* (2023), which, like most similar guides, promises success, profit and skills development. For the most part, these guides do not promise a simple way of generating a text that is immediately ready for publication, but rather aim to demonstrate how ChatGPT can be used for inspiration or as a starting point for one's own writing. Sometimes, of course – as in the case of the second of the above-mentioned books – they point the reader to the use of commercial tools such as the AI assistant Sudowrite.

A number of such assistants, which mostly function by connecting to ChatGPT via API, are available and what they offer is evolving fast. In mid-2023, for example, the tool Sassbook AI, an analogue of simple poetry generators, was available (https://sassbook.com/ai-story-writer). The application allows the user to choose the genre (sci-fi, romance, thriller, humour etc.), and then requires a prompt. The user can also choose one of three levels of creativity, set a number of variants to be generated based on one prompt, and enter the scope of the generated text. The generated text grows gradually, in small sequences, and the individual has control over the entire process; the generated text can be edited directly in the application's interface (the tool is designed to be an assistant, not an autonomous generator). The assistant called NovelAI (https://novelai.net/) works on the same principle (although it is more sophisticated), and is allegedly built on the original language models trained on corpora of literary texts. NovelAI can work in two regimes: 1. Storyteller, which assists the author in writing a story, or 2. Text Adventure, which automatically creates a story based on the input words. The assistant also works on the principle of gradual generation, although the maximum length of the generated text is 8000 characters. The user has an editing window in which the generated text gradually accumulates (based on the user's instructions) and in which the user can

continually intervene (human interventions appear in a different colour). The user can also reject the proposed sequence (generally short or compound sentences) and in this way generate a story in a controlled fashion. The individual, then, acts as editor, but can also be more active; the system also reckons with the possibility that human text-creation activity will predominate and that the assistant is activated merely when, for example, another idea is needed. It is likely that analogically functioning assistants will become a normal part of the working environment, and that they will no longer primarily be designed as tools for writers, but for use by any users with the task of creating material including a textual component. This is also true of the popular Canva environment (https://www.canva.com/create/story-generator/), which an Open AI text generator called Magic Write is directly integrated. Magic Write acts as only one of a number of functions of this environment otherwise intended for graphic creation. In addition to the above-described functions, some AI assistants also allow a choice of national language in which the user can generate (this is an option in the applications Rytr or Nichness, for example). It could be said that the entire AI assistant industry is developing rapidly into serious applications, but also into a number of tools of dubious quality and design, such as Dreampress.AI, which is exclusively for entertainment and attempts to lure the user to generate erotic stories, a feature blocked in basic ChatGPT.

During 2023, this option for easily creating books of prose (particularly in popular genres attractive to readers) had a measurable influence on the international book market. As early as February of that year, Amazon was offering more than 200 books in which ChatGPT was listed as a co-author, and in July there were more than 1000. This tool's accessibility also affected a number of magazines. For example, Neil Clarke, editor-in-chief of the science fiction magazine *Clarkesworld*, stopped accepting submissions to the magazine due to the sharp increase in the number of texts created using AI. He justified this by saying they were from people who were only interested in being published but did not want to make an effort.

This vernacularization process, then, does not merely encourage beginners or somehow disadvantage authors, but may also cause difficulties by glutting and overloading editorial capacity (which is why these texts are usually self-published) and can also be misused for entirely utilitarian and exclusively financial gain motivated by activities, such as the publication of the book *The Prince*: *A ChatGPT story* (2023), signed by Martin Shkreli, who was dubbed "the most hated man in America" for his speculation on the pharmaceuticals market; the book sales are intended to help him out of the financial problems he found himself in following the scandals.

Up to now, GPT-4 has intervened in Czech prose in the form of the third instalment of the *Digitální spisovatel* [Digital Writer] project only. Unfortunately, no details of the generation methods have been disclosed, except for the statement of Anna Vošahlíková, executive producer of Český rozhlas, who was involved in the generation: "For example, for the story *Lost Portrait* I entered the task 'write a horror story ending in a twist'. It wrote several and I chose the one I thought most interesting. Then we cast the short story, recorded it and did the sound design. This process was similar for all episodes of *Digitální spisovatel 3*. The difference was always in the initial task entered." The stories are available on the Český rozhlas website, such as the gothic horror *The Forgotten Portrait* (which was published including the texts of the input prompts), but also texts generated in creative radio genres, such as a true crime podcast or a report on the fictional discovery of a hitherto unknown castle in Šumava in southern Bohemia. The reports generated are presented in the voice of the famous radio presenter Jan Pokorný, with the intention of achieving a maximally authentic impression, or rather of boosting the mimicry applied within the reception game.

Under the pseudonym Benjamin Taylor (a generated pseudonym), the Slovak technologist and philosopher Milan Novotný created the story *The Stoic Trail* using ChatGPT, which generated seven chapters one after the other. The story takes place in the forest, in which a father attempts to teach his daughter Lily about the practical use of

Stoic philosophy. The narrative, created around the conversation between father and daughter as they hike, attempts to provide a light, comprehensible introduction to understanding this philosophy using the examples of Stoic behaviour that the father ascribes to the characters whose story he tells. Lily asks her father to tell her a story: "Something to take my mind off of things?" In each chapter, the father tells a different story as they trek through the forest and find campsites: about courageous Eron, wise and peaceful Marcus, generous and heroic Sofia, and Zenon, the founder of Stoicism. The 33-page book with the generated cover and illustrations is presented on the platform Gumroad as suitable for children aged 7 and over. In this case, too, the literary quality of the text was not the focus (nor was the attempt successfully to generate a prose text in a small national language – the story was created in English), but rather to explore the possibilities of creating the relatively structured content provided by ChatGPT for people outside the literary scene. At the same time, by depositing the book on the Gumroad website, which sells e-books, and putting information about the book on some forums, the aim was also to explore access to culture marketing and its processes.

The use of GPT4 and ChatGPT in this way vernacularized not only the process of writing texts, but also publishing books, generally books of a specific genre. We will turn our attention to the questions of what this triggered for literary culture and the results it has had in the chapters The vernacularization of synthetic creation and On the myths of artificial intelligence.

7

Deploying neural networks in drama and theatre praxis

It could be said that the aim to put on stage machines that will bring new and more intensive experiences is really old in the theatre practice. Of these, we should at least mention the mechanism called the eccyclema, used as early as the 5th century BCE in the theatres of antiquity, which resembled a rotating platform and made it possible to display a hitherto hidden interior space and what was happening within it. Today, the most progressive technology used by dramatists and actors is undoubtedly artificial neural networks, deploying a range of different methods and for different purposes. The nature and extent of neural network involvement in theatre creation – unlike synthetic poetry or prose – is not fixed, given the perfection levels of currently available technologies, the size of language models, or similar, but rather lies in the intention with which theatre professionals reach for such technologies. For this reason, this chapter will be structured somewhat differently from the previous two, and will place greater emphasis on the genre-typology aspect, although the developmental perspective will also be applied.

Theatre director Annie Dorsen, who has been using these digital assistants in her stagecraft since approximately 2010, can be considered a pioneer in the application of these technologies. This artist is generally deemed the founder of the new genre of algorithmic theatre, which explores the influence of the digital world on society by connecting artificial intelligence with classic theatre techniques.

Dorsen herself uses this term, which references the well-established concept of algorithmic art, because she is motivated to distinguish her art from the genre field of multimedia performance, to which algorithmic art is certainly related. However, it differs in its basic objectives; it is not about expanding the forms of representation, but rather about the algorithmization of creation based on Dorsen's original software which, unlike applications of ready-made technologies, allows her to integrate the algorithm into the structure of the work and make this very process of creation the theme (Dorsen 2017).

Dorsen was working in this way in the already mentioned year of 2010 when she created the technology for the performance *Hello Hi There*. She programmed two chatbots for this performance's requirements so that they could hold a dialogue on stage without the assistance of human actants. The aim, however, was not to imitate any interpersonal conversation, but to follow up on the famous television debate between Michel Foucault and Noam Chomsky in the 1970s. No two performances were identical, because the chatbots generated an original conversation each time they were rebooted. However, what

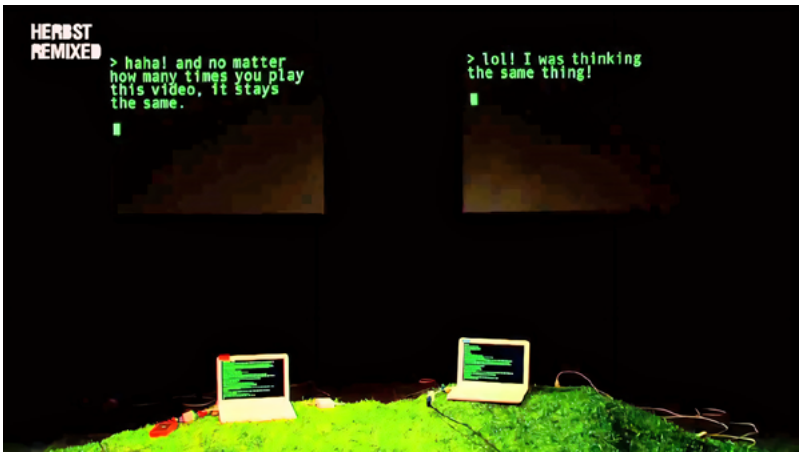

Fig. 5: Anne Dorsen: *Hello Hi There.* Screenshot from the website https://www.youtube.com (2010)

always worked was the primary concept that put human and artificial intelligence into direct confrontation. What was important was the constant improvisation of two machines embedded in a dialogue situation, while the conversation output was visualized as a projection of the individual lines as they were generated; at the same time, it was presented auditorily using a human voice synthesizer. From the recordings, it may be concluded that the generation was of very high quality in linguistic terms, and the dialogue coherence was likewise very good.[25] The performance can also be deemed attractive to the audience, because a number of humorous linguistic situations arose during it.

Annie Dorsen's algorithmic theatre, then, combined the intention to create a production with as little dependence as possible on human actants, but that also contained live, even improvised conversation. This combination means that Dorsen's experiment remains unique, though we can also see it as foreshadowing the two main lines in which the culture of neural networks has influenced theatre culture: the line of improvisational theatre and the line of generative production of synthetic dramatic texts or scripts.

ARTIFICIAL NEURAL NETWORKS IN IMPROVISATIONAL THEATRE

In the field of theatre improvisation, the project *Improbotics* must be the first mentioned, as its international, interdisciplinary team has been using neural networks in performances since 2016.[26] The project was co-created by AI and robotics researchers Piotr Mirowski (Great

25 See this recorded performance: https://youtu.be/3PiwEQQNnBk

26 The project was originally called HumanMachine and focused more on connecting artistic and scientific approaches to artificial intelligence. In terms of staging, it rather resembled the stand-up comedy of Piotr Mirowski, based on a conversation with a robot. The original project website can be found here: https://humanmachine.live/

Britain/France/Poland) and Kory Mathewson (Canada), who were later joined by director Jenny Elfving (Sweden), science communicator Ben Verhoeven (Belgium) and communications and digital media expert Boyd Branch (USA).

They use their own bespoke software system, called A.L.Ex, for their stage performances. This system was continuously improved in conjunction with the available neural network technology and gradually improving and expanding language models. The first version was constructed on an RRN; the models GPT-2 and GPT-3 were later used and trained on the OpenSubtitles dataset (a corpus of film subtitles, which was suitable for training networks to generate lines of dialogue). Google's Universal Sentence Encoder and DeepMind's BigGAN were also used, given the multimedia nature of the stage design for these performances.[27]

The system is designed with regard to the deliberate close partnership between human and machine during the performance, and does not aim to make the machine autonomous. The key role is then taken by the operator, who enters prompts into the system interface during the performance. And it is precisely this human operator that ensures coherence, or rather the corresponding contextualization of the system's generated inputs in the ongoing performance, by entering as prompts the lines just spoken by human actors (voice recognition software helps here) and returns one already generated sentence to the system to ensure that the utterances are coherent. (In actual fact, this is partially a manual imitation of hierarchic generation as used by the Dramatron system, which we will come to later.) The system then launches three generations, one after the other, thus creating three sets of sentences, from which the operator then chooses suitable lines as they see fit (but does not have to choose any). The operator is therefore largely responsible for the artistic effect created by

27 For a more detailed technical description of the system, see this article: Branch – Mirowski – Mathewson. Collaborative Storytelling with Human Actors and AI Narrators. arXiv preprint arXiv:2109.14728, 2021.

this method of involving a generative neural network in the performance. Not only is the choice of generated sentences important, but so is timing their involvement in the ongoing performance, which is crucial, particularly in comic theatre. The operator's role in a performance staged like this is demanding, and understandably, a human being will, when operating such a system, make mistakes, which then appear in the generated outputs. However, this fits well with the concept of improvisational theatre, where a mistake is always more of an inspiration than a limitation.

A visual avatar embodying an AI narrator was used during the production. The avatar resembled a 3D robot model; it was created using the program Cinema 4D7 and imported into the application Adobe Character Animator, where it acquired the form of a puppet controlled by the operator's facial expressions. Later this avatar was replaced by a small humanoid robot made by EZ-Robot, which is controlled by the original software.

Based on this principle, and in the style of multilingual improvisational theatre, a performance called *Rosetta Code* was constructed and premièred in 2019. The freely accessible services Google Translate and Google Voice Recognition were used because people from different parts of Europe took part in the performance. The performance was in English with real-time machine translations into Arabic, Dutch, French, German, Italian, Polish, Spanish and Swedish. Meanwhile, one of the performers – the audience did not know which – was instructed by the computer system via headphones and was actually only regurgitating the generated sentences. The audience's task was then to guess who was human and who was merely mediating sentences created by the robot. The performance's main theme, however, was communication itself, or rather, the possibility or otherwise of using machine translation to create understanding between languages.

The hallmark of this project (and the A.L.Ex system itself) is then that it was not designed merely to generate lines, but it should first and foremost take on the role of narrator, who ensures that the

improvised story develops logically and that there are none of the mistakes essential for improvisational theatre; namely that disparate motives are introduced into an already established dramatic situation. In the creators' view, the main hallmark of improvisational theatre using an AI narrator lies in the actors being able to focus more on building relationships between the characters due to this AI involvement, because the computer makes suggestions for moving the plot forward and creating plot twists. It also assumes the role of arbitrator in deciding to change the status of individual characters or their presence on stage: "We believe that one of the potential applications of computational creative systems could be to alleviate the cognitive load of performers to shift their focus from plotting to reacting."

The improvisational aspect in the stage or other theatre application of neural networks logically fits into the strategies used by the creators of generative literary projects to deal with imperfections in the synthetic text or glitches arising when the neural network is deployed in real time on stage. Here, again, we encounter the principle of mimicry, which draws the creators and recipients into a shared game that produces meaning. Members of the international theatre community Theatre of the Electric Mouth also worked with the moment of surprise in the generated text and the comedy of its imperfections when, during the Covid-19 pandemic, they recorded staged readings of generated dramas and then disseminated them as podcasts. The original intention relied on the actors only receiving the text as the recording started, or rather, live streaming; however, it became the practice for the actors to obtain the text 30 minutes before broadcasting. Allegedly, the problem was that the neural network chose themes that were too everyday and humdrum, which did not harmonize with the intention of creating humorous works. A definitely guaranteed space for human creativity was, then, necessary.

The Czech improvisational theatre project *OK Carbon*, by director Peter Gonda (dramaturgy by Adam Dragun, premièred on 12 November 2021), also worked systematically with the imperfections, even errors, arising from the generation. The important principle underlying

this performance was alternating roles: the neural network would first be given questions (as a prompt) and would respond, then the computer generated the questions and a human answered them. It was as if the creators wished to make a non-violent comparison between human and machine creativity in this way. A performance based on generating texts in real time anticipates a great ability to improvise on the part of human actants, which brings with it numerous "errors" and illogicalities. However, the same also occurs when machines generate texts – that is, not just creativity, but also the error rate, is similar for both human beings and artificial neural networks.

The neural network is not active in other parts of the performance, in which the interactions are purely between (non)actors, or (non) actors and the audience (the director deliberately assembled a set of people with no actor training, which again is much more in tune with the principally "non-professional", frequently only experimental outputs of computer generation). At other times, again, the (non)actors functioned as a mere loudspeaker for the neural network (the generated text was relayed to them via earphones and they articulated it aloud). The performance, then, primarily asks questions about

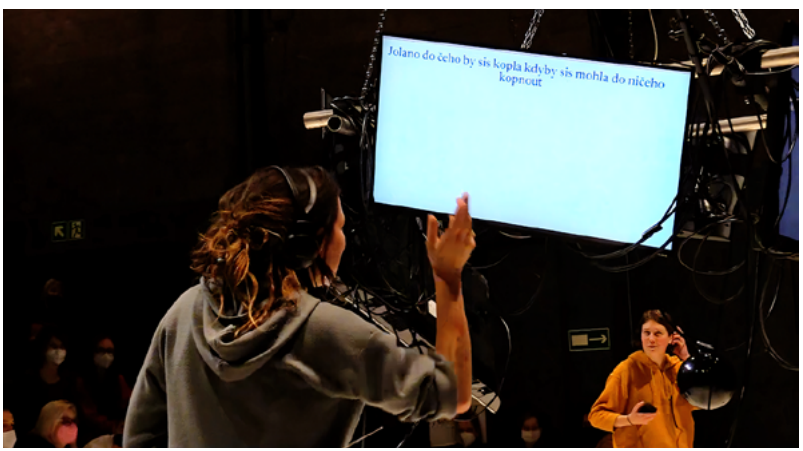

Fig. 6: Peter Gonda: *OK Carbon*. Photo from the performance at the Alfréd ve dvoře in Prague by Michal Hančovský (2021)

whether the domain of perfection resides in the human or the machine world. And also about who is actually playing the primary role in a culture saturated with machinery – is it humans, even though they frequently find themselves in a mere service role for technology?

The performance's main mission is to present both humans and machines as flawed and imperfect. The direction accommodates this flawed nature – operating the neural network is mostly linked to the surrounding microphones and to the voice recognition app, which of course is frequently in error[28] (and, what is more, a likewise imperfect machine translation between Czech and English is also used). A pianola is placed on the stage and, at one moment, an actress sits at it and plays, together with the machine, on one keyboard, thus symbolizing the essence of assisted creativity, the interplay of human and machine.

The performance *Climateprov* is also constructed on the improvisation principle. It premièred during the AI and new media festival Future Fantastic in Bangalore, India, in March 2023. Artists from India, Great Britain and South America were involved in the performance. Its main theme was climate change – the performance aimed to foster a debate on the climate crisis in the form of a funny, absurd conversation between humans and artificial intelligence. The performance has no fixed plot or storyline, but rather relies on the creativity and improvisation of the performers, including the neural network. The spectators suggest prompts on the subject of the climate crisis, then the performers and AI together improvise on the topics entered. Here AI is both a team-mate and, in some moments, the powerhouse of the

28 Voice-operated neural networks were also a significant technological motif in the stage literature of the cabaret EKG, which devoted itself to the theme of "Love and Intelligence" in October 2023 (Archa Theatre, première 29 October 2023). Unlike the *OK Carbon* performance, the cabaret's creators already had access to the mobile application VoiceGPT, which handled the voice interaction between human and neural network (or rather ChatGPT) almost flawlessly – the neural network was prepared to hold an improvised dialogue with the cabaret's protagonists based only on the prompts defining the characteristics of the fictional speaker.

entire performance. The set has its own technical solution for generating texts with visualizations, which is constructed on machine speech recognition, the generative models GPT-2 and GPT-3 or BERT and DALL-E and Stable Diffusion, models that generate images. The AI inputs and outputs are visualized directly on the stage, meaning that the audience also has the opportunity to interact. The audience's prompts to the improvisers are presented as a parallel to the prompts entered by the artificial intelligence.

In practically all examples of improvised productions given here, the improvisation principle is combined with elements of interactive theatre – on the understanding that human improvisation dominates the performance and the neural network takes the role of a teammate. The audience can then partially participate in the performance by, for example, selecting topics for individually improvised scenes or plays. Neural networks are of course also deployed in these theatre (and overwhelmingly experimental) projects, in which the relationship between these elements is different, reinforced particularly in the sphere of interaction between audience and stage.

The performance *Humarithm,* staged in June 2019 by NRW-Forum in Düsseldorf, was already interactive, even immersive in nature. In it, a neural network collaborates with the audience and attempts to answer the question of what it means to be human (the performance was part of the celebrations of the 70th anniversary of the adoption of the German constitution). The production tells the story of an artificial intelligence named HUMA, which successfully acquires consciousness and longs for all the other traits of humanity: feelings, knowledge, a body, dignity, power. At the same time, it offers its abilities to resolve complex questions associated with the climate crisis. The performers had the opportunity to familiarize themselves with the principle of machine learning firsthand, because they were involved in feeding the robot with training data. This data took the form of the audience's emotional reactions to various stimuli which, within theatrical fiction, were meant to enable the robot to understand human experience and learn to imitate it. The performance had

a strong ethical and didactic dimension – the involvement of entire school classes in the immersive theatre process was anticipated – and the accompanying didactic materials for teachers were also part of the project. The company HeartWire was responsible for the entire performance; it is aimed at young people and uses modern technologies to create educational experiences for them.

The project *PL-AI*, for which the dramatist Niall Austin is responsible and which was premièred by the Dublin Civic Theatre in March 2023, similarly straddles interactivity, immersion and didacticism. The project's creators wanted to maximize audience participation, but not via the usual methods of interactive theatre (that is, interaction between spectators and actors during the performance), but in a new, experimental manner. That is why the audience's role is highlighted right at the beginning of the performance, or even before it starts: the audience chooses the play's genre, theme, setting, characters and plot twists. These inputs are then entered into the generative neural network that creates the script. ChatGPT was used for generation here, while a human moderator mediated between the audience and the machine. The text of the play was then created directly before the performance, or even during it, based on the audience's initiatives. The actors can see the text on a monitor and then improvise the staging. This project, too, has its didactic dimension (incidentally, highlighted and presented by the creators), consisting of allowing the audience an insight into the creative process behind a theatre performance and, at the same time, removing its fear of AI. The creator also defends the project from the ethical perspective as an opportunity to be more inclusive and to allow people who are otherwise insufficiently represented to become theatre creators.

The creators of the Slovak play *Babylónia* (directed by Ema Benčíková, premièred on 17 September 2022) also worked with the principles of interactivity and immersion. However, their involvement in the structure of the resulting performance was much smaller and the role these principles played did not consist of connecting individual actants in the said theatrical event (a generated script, actors and

audience), or even in compensating for the imperfections in the generated script (as was the case in a number of the projects described above); rather, the aspects of interactivity and immersion here merely put the finishing touches to the production's poetics, and were primarily settled by the specific form of stage design and the intermedia nature of the entire work. The *Babylónia* project actually works with a pre-generated, finalized script (this means a deliberately stylistically diverse text montage), which is not intended to chart a generative system with broad application in theatre praxis – unlike the projects we will analyse in the following section.

The model GPT-3 was used to generate the script for the theatrical production of *Babylónia*. Scriptwriter Štefan Benčík entered various devised, lengthy prompts into the model, inciting the model to continue in the specific style of the text presentation. The resulting script, then, consists of a montage of various alternating linguistic styles, depending on the sequence of scenes in the play; surprisingly, these styles cover dialogues, quasi-philosophical papers, poetic language, song lyrics and journalism. The creators also work with a digital aesthetic in a number of other aspects of their work, such as the form of live visual projection by the digital artist Alexandra Gašparovičová with post-internet aesthetics, punk-vapourwave styling and post-left tendencies. Musician Daniel Rychlo is also permanently present on stage, creating a musical element in real time.

The play premièred in September 2022 in the Bratislava cultural centre PAKT, and although its name may refer to the stories *The Library of Babel* and *The Lottery in Babylon* by Jorge Luis Borges, it is much more urgent in its criticism of information noise, human anxiety, fear, and feelings of helplessness and despair due to social FOMO, distorted infoscenes, the pressure of network manipulation mechanisms or the semio-capitalist profit game. Although neural networks are perceived as black boxes, their resulting text is always influenced by the prompt entered into the program by the scriptwriter, both in genre and in content. In the case of *Babylónia*, its creators were not satisfied merely with generated texts in different genres, but also

provided GPT-3 with an impulse for resolving a dramatic situation: "The stage design solution for the production *is a composition of a multi-dimensional means of space creation*" (generated prompt completion italicized), the text that fundamentally influenced the scene. The creative team used Burian's theatregraph – a stage system in which the actors move before and behind projections on a screen – to construct the set.

In almost every scene, the actors portray different people, focusing on different types of relationship and the breadth of the problems outlined by Generation Z, thus also portraying the world of Millennials. Indications of GPT-3's isolation, including its inability to connect to the current situation, are dramatically translated into, for example, a time loop for New Year 2021, or the absurd statement that there is no war in Ukraine. Documenting the limitations of neural networks by varying scenes in which the given limitation is raised to hyperbole and then performed as the metaphors we live by is an excellent way of avoiding direct criticism through artistic means.

Fig. 7: Ema Benčíková: *Babylónia* [Babylonia]. Photo from the performance at PAKT in Bratislava by Michal Líner (2022)

Although *Babylónia* is the result of text generation, it is an exclusively human performance and – unlike the technological progress sanctified by capitalism – it has empathy for humanity. It passes through states and fluctuations of the human psyche, emotional stresses and communication situations in a close circle of friends against the backdrop of information pressure, excessive pressure from social media and media-simulated care, which in fact powers the wheel of income and consumption. It is a meta-modernist take on authenticity and emotion, on hope, support and sharing highly personal narratives exempt from exaggeration or irony, but also a critical attitude to consumer society and the capitalist exploitation of people and resources. This would be the first Slovak performance of a generated text, had the Anton Cíger Elementary Art School of Kežmarok, in partnership with Poprad Elementary Art School, not staged a performative remediation of the book by neural network Liza Gennart entitled *Databáza neistôt* [Database of Uncertainties] (directed by Emília Šavelová and Alena Váradyová) in the Hviezdoslavov Kubín competition in June 2021, which we will discuss in the chapter on intermedia works.

GENERATING SYNTHETIC SCRIPTS AND DRAMAS

The generation of scripts or the text of plays constitutes the second area in which neural networks are deployed in the dramatic arts, alongside improvisational or interactive theatre. The first attempts to use the abilities of neural networks in this way – that is, in the process of writing a play or script, which was then staged in the usual way by directors and actors – were of course in film.

As early as 2016, Ross Goodwin, whom we already know well (see the chapter on generated prose), and director Oscar Sharp were involved in a challenge as part of the Sci-Fi London film festival, which consisted of giving a neural network 48 hours to create its own script,

or rather film, after being trained on sci-fi film scripts. This was how the short film *Sunspring* was created, which placed in the top ten in this competition; at the time, the neural network was still called Jetson, but it soon suggested that it rename itself Benjamin.

The following year the same creators entered the competition again, with new actors (including David Hasselhoff). This time, they had a clearer plan for using AI as a tool to expand human abilities, not to replace them, so they followed the route of assisted creativity. Oscar Sharp wrote passages framing individual scenes and the neural network then generated dialogues based on training with a corpus of Shakespeare's dramas and film subtitles. The resulting film, entitled *It's No Game*, ultimately came third.

In 2018, they entered the competition again and this time, they let the neural network generate everything – and in addition, they incorporated face-swapping and voice-generating technology. The neural network, then, did not just generate dialogues, but also proposed individual scenes, placed the actors' faces on individual characters, and the like. The neural network was trained on Amazon Web Services, and for the face-swapping they reportedly used two different GAN networks simultaneously, and also the TensorFlow network. However, the resulting film, *Zone Out*, did not this time place in the competition, but was at least successfully completed within the stipulated time limit. This attempt sought to draw attention to the problem of deepfakes, among other things (e.g., easy face-swapping in pornography), and this was successful.

These attempts with film scripts were certainly groundbreaking for the time (even given that language models as large as those that appeared only a few years later were not yet available in the second half of the new century's second decade). Nevertheless, they are indebted to their experimental and, one might say, critical or even subversive concept, that is, the intention of drawing attention to the approaching era of rapid script generation and film production, and also the ease of image manipulation. Creating a script that could be used in routine film production became the aim of these creators.

The team behind the project TheAItre also took this intention as its objective; on this occasion, they did not have so tight a deadline as Goodwin and Sharp for creating the text of their play, but they could devote three years to their research project (the results were also published as an expert monograph, Schmidtová 2022[29]). Computational linguists from the Institute of Formal and Applied Linguistics, Faculty of Mathematics and Physics, Charles University, theatre experts from the Theatre Faculty of the Academy of Performing Arts in Prague and artists from the Švanda Theatre all participated in this project. The principal output of the project was the play entitled *AI: Když robot píše hru* [AI: When a Robot Writes a Play], or rather the staging of this play, which premièred on 26 February 2021, in which the authors wished to contribute to the 100th anniversary celebrations of the première of Karel Čapek's drama *R.U.R.*, in which the word robot was used for the first time. The production was accompanied by a closing discussion between the audience, the authors and experts in artificial intelligence, in which the creators wished to contribute to better general knowledge about the possibilities and risks usually associated with artificial intelligence. However, no form of AI was used during the production itself.

The creators used the language model GPT-2 to generate the texts, which they left in its original, pretrained form, that is, as OpenAI provides it. A corpus of English-language film scripts was used for minor editing purposes only. The creators explain that they used this procedure due to the difficulty of obtaining a sufficient number of play texts online. The play text was thus created in English, then the final text was translated into Czech, not of course by commissioning a human translator, rather by using machine translation (researchers at the Institute of Formal and Applied Linguistics, Faculty of Mathematics and Physics, Charles University, have long worked on this).

29 Schmidtová, P. et al.: THEaiTRE: Generating Theatre Play Scripts using Artificial Intelligence (2022)

Nevertheless, the input of human actants into this project was significant. The text was also generated in small sections (on the human-in-the-loop principle), when David Košťák, script editor for the Švanda Theatre, entered input lines into the neural network and the network then built on them. The neural network generated ten lines of text for each prompt, and the script editor assessed them for usability, or for whether it was necessary to re-generate the given text portion. He could also edit the generated passage at that point; that is, insert his own lines into them. The creators state that the resulting text of this play is 90% computer-generated and the remaining 10% consists of the script editor's interventions. These figures, however, describe only the proportion of the textual surface coming from the machine, or from human hands; it leaves to one side the entire set of decision-making and creative activities that can be quantified only with difficulty. The nature of the characters and the plot of the

Fig. 8: TheAItre: *AI: Když robot píše hru* [AI: When a Robot Writes a Play]. Photo from the play at the Švanda Theatre in Prague by Alena Hrbková (2021)

whole story, or the composition of the drama, were also created in advance (by the above-mentioned script editor); during the generation process they were filled with a specific text. In this way, a story was created in which a robot wanders through the human world, gradually starting dialogues with other characters and speaking out on existential subjects like love, fear, death and violence. In linguistic terms, the text generation method was clearly evident, as the neural network was not specially trained on literary texts, but only on crude language material from Wikipedia and the social network Reddit (GPT-2) – meaning that the resulting text has no frills, but contains a relatively high frequency of vulgarisms and a significant number of sexual motifs.

As part of the same project, the same team generated another play using a second version of their software system (THEaiTRobot 2.0) with, however, the difference that on this occasion Josef Doležal took on the role of script editor and entered the prompts. The play is called *Permeation,* and premièred as a stage reading on 12th June 2022 at the Rehearsal for Truth festival at Bohemian National Hall, New York.

When generating the second play, the team's ambition was to use the hierarchical generation method and allow the neural network to create the play text in one go, rather than in small sequences, as had been the case for the first play. In addition, the team hoped that generating from a fixed synopsis would further minimize any human interventions required in the generation process. In this case, the text was generated by a GPT-2 model tuned to generate drama; that is, a smaller model than for the first play (for which the untuned model vanilla GPT-XL was used).

The team successfully achieved the aim of generating the entire text of the play at once, although the quality of the resulting text was, however, not satisfactory, particularly in terms of coherence. The system did not always allow for the already generated sequences, or sometimes returned to previous sections at random and without making sense. The second aim, to minimize human interventions, was of course not achieved at all; in fact, more such interventions

were needed than for the first play, in which an intervention in the repeated generation was needed approximately every 15 lines; in the second play, practically every line needed to be corrected, and sometimes more than once. Ultimately the team went back to a generation process close to that used for the first play, as the operator could at least attempt to imitate the hierarchical approach (definitions of whole scenes were not stipulated in advance, but a whole scene was gradually built/generated based on the generated sequence, while the previous sections were used as prompts). This approach was successful and allowed the team to reduce the number of human interventions to the level of the first play. The resulting play was themed around the adventures of a married couple who ran away from their home before a war starts, and touches on themes such as politics, patriotism, revolution, and the like. This thematic focus was partly settled by the period in which the play was created, which overlapped with the start of the Russian invasion of Ukraine. The play was produced in English, but only in the form of a dramatized reading.

The same software system was used once more, to generate a script for a cabaret performance by Prague Clockwork Cabaret, which was part of PLai Prague; there is a crossover with the TheAItre project in terms of staff (Tomáš Studeník, Josef Doležal). On the website www.plaiprague.eu the authors declare that AI generated the script, stage design and music for this performance. More detailed documentation on this project was, however, not published. The play was rehearsed by drama students and produced in English. The impetus for the entire project was the Czech presidency of the European Union in 2022. This is another reason why its subject is "five short stories from Czech history" (Forefather Czech Arrives, Jesus in Prague, Smetana and Beethoven, The Birth of the Golem, Preparing for the Presidency). The published script makes it clear that the creators did not in any way fundamentally prevent their neural network from hallucinating, and indeed left the text uncorrected, which they then presented as a deliberately surreal vision, although the result is rather

closer to a dadaist grotesque. The play was performed on a tour in European cities.

Generating the complete text of a play in one go was also the objective of the Dramatron project, for which the laboratory Deepmind, a Google artificial intelligence development centre, is responsible. The scientific results of this project appeared in the study "Co-Writing Screenplays and Theatre Scripts with Language Models: Evaluation by Industry Professionals", which was published in 2023; Piotr Mirowski, the leading figure in the above-mentioned Improbiotics project, is listed as the main author (Mirowsky et al. 2023). In this article, the authors state that the Dramatron system can handle hierarchical generation and is suitable for projects aiming to create more extensive texts over longer time periods.

In technical terms, the Dramatron system is built on the language model Chinchilla, a neural network with 70 billion parameters. This network was trained on 1.4T tokens from the MassiveText dataset; that is, a corpus containing texts from 604 million websites, 4 million books, 1.1 billion newspaper articles, 142 million codes from GitHub and 6 million headwords from Wikipedia. An important technical parameter in which this system differs from all the previous ones is the size of the context window, which in an ordinary language model usually has the scope of 1500 words; this is insufficient for the coherence of a longer text. Dramatron can create a coherent script with a length of up to several tens of thousands of words. This, then, is a much more advanced system than, for example, the one used to generate the play *AI: Když robot píše hru* [AI: When a Robot Writes a Play], where it was necessary to generate short sections and consequently the play was fragmentary in character. Unlike the older systems for generating dramatic texts, which needed a human referee to ensure the coherence of a longer text, Dramatron generates a text without ongoing human supervision, although of course human intervention during the generation process is not precluded.

The creators designed the system following Aristotelian poetics of drama, or more accurately, of tragedy, in which Aristotle

distinguishes between the dramatic elements of plot, theme, story, characters and dialogue. Therefore, before starting the generation, the system user faces the task of defining the theme of the future script/drama, and Dramatron then helps them to create characters, a plot and dialogues. In one step, a synopsis of plots is created, resembling a sequence of watershed moments, to ensure that the story is coherent. The generation of individual scenes is then linked to this synopsis. The key input for generation is the log line, in which the user summarizes a description of the setting, main characters, nature of the plot, etc., in a few sentences. This is in actual fact a prompt from which the next phase of hierarchical generation is derived. This prompt can be adjusted while generation is ongoing.

Dramatron divides hierarchical generation into three levels: 1. The highest level is the already mentioned log line, where the theme and dramatic conflict are defined; 2. The middle layer is made up of a description of the characters and the scenes that constitute the plot and a description of the plot settings; 3. The bottom layer contains the characters' dialogue. In this way, harmony is reached between the content represented in individual layers, while the creators acknowledge that, by the word "coherent", they primarily mean the creation of a single textual whole, and not necessarily the same logical or emotionally consistent story. In other words, Dramatron guarantees the creation of a closed story arc, to maintain the unity of character and place and the logical order of scenes, but does not guarantee logic at the level of individual lines or even a meaningful emotional tone.

Dramatron's creators are evidently striving to make it practically applicable in the cultural industry. That is also why the above-mentioned study contains 15 reports on system test deployment, which professionals from the industries in which it could be put into practice were able to try out the code before it was launched. The outcome established that the system does not create autonomous or even entirely automated scripts or dramas that could be staged without further adjustments, but that it is able to create a textual basis

that significantly simplifies and accelerates the work of human scriptwriters, dramatists and script editors.

Five scripts that Dramatron was involved in creating during the testing phase were staged in August 2022, under the title of *Plays By Bots* at the Fringe Theatre Festival in Edmonton, Canada. The productions were conceived as half-improvised – the actors were given a script in sealed envelopes that they could open only after the performance had started. The performance, then, began with a script reading and, in the second half, the actors improvised around the motifs in the text and created a conclusion for each play. The improvisational principle in the role of mimicry, in order to compensate for the shortcomings in the generated text, was therefore ultimately also applied here. No other reports on the use of Dramatron in theatre or film production are currently known of.

In general, however, it can be said that the intersection of the culture of neural networks with theatre culture may harbour a considerable potential, which arises from the wide range of forms, roles and rate of neural network deployment in the theatre. In addition to the two main areas described – that is, improvisational or interactive theatre on the one hand, and generated synthetic play scripts on the other – there are a number of other spheres that neural networks are beginning to penetrate: stage design[30], direction[31] and theatre marketing. In addition to the generation of popular genre literature, theatre and screenwriting appear as a second area in which neural networks may, from the perspective of mid-2023, find a meaningful and long-term application. The process of vernacularization, which

30 For an overview of how to apply neural networks in stage design, see, for example Forsee: 2022.

31 The theatre project *Regie: KI* (Direction: AI, Düsseldorfer Schauspielhaus, 2020) involves neural networks in the process of directing a theatrical production in a relatively sophisticated manner (for example, it records the actors' mimicry and assesses whether they are sufficiently expressing the appropriate emotion). The facial expressions and movements of actors aged between 17 and 70 were monitored by a neural network over several months and the theatrical training functioned as a partnership between the neural network and theatre staff.

entered the culture of neural networks along with Chat-GPT, is also ongoing here (experimenting with neural networks is possible not only for professional and interdisciplinary teams, but also for practically every amateur theatrical company today[32]), but does not play as fundamental a role as it does in poetry or prose generation. This follows from the nature of theatrical creation, which must of necessity reckon with a reaction from or even the presence of an audience, that is, with a meaningful communicatory involvement with the given technology; this means that a feeling of self-satisfaction over, say, a published collection of generated poems, cannot be enough. Of course, on the most general level of reflection and self-reflection, theatre culture responds entirely comparably to other literary and artistic fields – contact with artificial neural networks has repeatedly led it to reflect on humanity itself, the relationship between humans and machines and, last but not least, the self-reflection of art, that is, in this instance, particularly by exploring the question of what theatre actually is, who creates it and in what roles, what weight these roles have and when is theatre really human and really good.[33]

32 The play *Ten Strangers in a Room*, which was generated using Chat-GPT and then staged in June 2023 by a student society at the University of Wollongong, Australia, may serve as an example here: https://www.uow.edu.au/events/2023/ten-strangers-in-a-room.php

33 This question was explicitly asked by, for example, the German theatre ensemble CyberRäuber in the performance of *Der Mensch ist ein Anderer* (premièred on 1 October 2021 in Wiesbaden).

8
Synthetic visual art

In this chapter we will concentrate on contributions to synthetic visual art, but given the breadth of this approach, method and artistic theme or artistic-research position, we have decided to focus on works originating in the Czech or Slovak artistic context only. As synthetic art has become a very broad field with great variability from professionals to amateurs, it would be difficult to treat its "substance" in these few dedicated pages of our book. The use of neural networks has also become so widespread that some terms have been coined for this method: "neural art", "AI art", "synthetic art". Artist Mario Klingemann describes his position as "neurographer", and artist and designer Refik Anadol called his series of kinetic media pictures that process data "neural paintings". Artists such as Sofia Crespo, who connects biological and technological systems, poetics and aesthetics; Anna Ridler, who works with conscious systems and technologies to create unusual visual narratives; Memo Akten, who uses neural networks to reflect a human sense of the world; or Sougwen Chung, who creates art using assisted creativity with neural networks, robots and many other things, are all producing inspirational work using neural networks in art.

This book aims to focus on our geo-local context, so for this reason we will attempt to describe works that have contributed to developing the public perception of synthetic art. Therefore, we have divided the chapter into a discussion of exhibitions and works of synthetic art and a mediation of the involvement of synthetic curatorship in the presentation of art in the digital space. At the end

of 2022, the edited monograph *The Black Box Book* was published in Brno; one of its central themes was working with LLMs in visual art and curating this art. Many of the contributors were from the Czech artistic-scientific community and we will start by focusing on them.

The collective monograph *The Black Box Book*, edited by the Czech theorists, pedagogues and curators Jana Horáková, Marika Kupková and Monika Szücsová, focuses on digital curatorship and innovative technology in curatorial theory and practice in the online space required by the situation during the Covid-19 pandemic, and is also devoted to various projects that emerged using machine learning on visual materials. The creators behind these projects (Andreas Sudmann, Lukáš Pilka, UBERMORGEN and Barbora Trnková) use artistic research in their texts to illustrate the reasons why they work with machine learning and the methods they used; they reveal the creation processes for the works and the data that they used as their training database. They speculate about suitable conditions for developing synthetic art and the particularities of the digital or physical exhibition space in which they place these works.

While Sudmann considers the more general context of computer creativity during AI Springs, which also resonate in the visual arts, Lukáš Pilka concentrates on an overall specific example of using machine learning, like *Digitálny kurátor* [Digital Curator], which comprises creative art archives from a large number of central European institutes. UBERMORGEN has an innovative, hyped proposal vibrating with a post-anthropomorphic attitude: *The next biennial should be curated by a machine*, a proposal already commissioned by the Whitney Museum of American Art New York and Liverpool Biennial 2021. Barbora Trnková's statement on the phenomenology of generated images is accurate and pertinent: "Individually created and selected images do not provide the strongest visual experience; rather, the output of this technology as a whole produces a sensation of immanent familiarity, a déjà vu of Western culture. It makes it possible to make souvenirs out of images of the recent, digitalized, selective present. But the promise of unlimited creation cannot be fulfilled.

Fig. 9: Barbora Trnková, Marie Meixnerová and Tomáš Javůrek: *AI: All Idiots*. Photo from the exhibition at the MeetFactory in Prague by Katarína Hudačinová (2021)

The dream of infinite possibilities literally turns here into a nightmare of imagination." (Trnková 2022: 348).

The curators' collective ScreenSaverGallery, composed of Barbora Trnková, Marie Meixnerová and Tomáš Javůrek, is responsible for the exhibition project *AI: All Idiots*. This exhibition introduces the process of generating visual material, with graphic examples of this process using published artistic research. Aimee, a digital avatar presented as a talking guide, accompanies visitors through the exhibition, which consists of statistical data, various generated images hanging on the walls, refashioned by human intervention, or associated with animation, objects in space, tablets with animations connected to automatic vacuum cleaners, mockuments, visualized datasets decomposed into coloured lines, loaded with AI-generated jokes based on names in the Czech visual scene. Visitors can even generate their own Czech synthetic art using a dedicated digital app.

A graph of statistical data documents the names of the Czech creators whose websites were compiled in the database, the proportion of male and female creators, the model size, learning time and other technical parameters. As Aimee the avatar says during the exhibition: "Andreas Gajdošík and Vilém Duha have uploaded the works contained in the dataset into the Google Open Images crowdsourced dataset to tag them as art. Before that, this tag had contained just an insignificant number of items. As a result, neural networks which will be taught on this popular dataset in the future shall perceive the notion of art in favour of the Czech visual art." (Trnková 2022: 369)

The artists Gajdošík and Duha harnessed the hacker potential of GANs to implement the Czech database of visual works into the world database Open Images Dataset by Google with millions of images, so that Czech art could virtually influence world art for a limited time period. This hack, which forms part of the exhibition's transmedia portrayal, proved that creativity assisted by human and machine can be exactly what humans want. Or, in the words of Andreas Sudmann: "we typically value and admire those achievements of machines that we also value and admire related to humans" (Sudmann 2022: 275). Trnková writes that generated images are not an instance of the strongest visual experience, yet they mediate a feeling of familiarity to us. The artist also claims that the images generated using text prompts on Midjourney do not seem as familiar because of the combination of the known with surreal stylizations, but rather because we are used to the surreal assemblage and postmodern fusion from media images and media experiences of our movement through cultural space: "We live in a culture of constant visual oversaturation. The products of text-to-image engines are just another highlight of this process." (Trnková 2022: 348).

TroublingGan is the StyleGAN model used by artist Lenka Hámošová, in technical consultation with Pavol Rusnák, to communicate the theme of a troubled time and its possible synthetic forms via visual material processed in this way. As a database, they used a collection of photographs from 2020 belonging to the news agency

Reuters, which almost exclusively, and characteristically for the given period, displays various natural and human disasters, conflicts, wars and pandemics. Because the moment entered into the source database of generated images is both oppressive and up-to-date, the recipient knows they are looking at synthetic proof of human cruelty, failure and disasters, even despite the indeterminacy of what they see. As the artists write: "This form of digital détournement challenges the assumption that synthetic visual media must inherently strive for photorealism. Instead, it engenders images that test our cognitive reflexes to recognise and categorise." (Hámošová – Rusnák 2023). The authors add that the spectacularity of visual synthetic media "seems to be a temporary effect caused by its novelty; however, the anxiety of its indefiniteness and its affective quality are features of its AI-generated origin and need to be accounted for when working with these visuals" (Hámošová – Rusnák 2023).

In addition to its own visual material, this project also aims to stimulate an artistic-critical debate on the socio-critical acceptance and use of the existing input data underlying the generation, that is, moving towards considering machine perception of the world in a new way, or moving towards a transition of existing stereotypes, biases, phobias and errors. In the visual treatment recalling a dystopian version of post-internet aesthetics, the boundary between objects, persons and environments is becoming blurred. Hints of skin, eyes, hair, or merely simulacra thereof, which long ago lost their original forms, flow out of the specified substance. The indefinite nature of the firm contours is also transmitted to the observer who, with no fixed point for distinguishing what is what, relies for perception on a feeling of hopelessness; the observer has nothing to associate this feeling with, although they know that it comes from a representation of their world. The imitation of recontextualization and abuse of photojournalism is another reference level, in which the emotional charge becomes the main reason for disseminating the visual, overshadowing the emphasis on factual events, places or people.

Fig. 10: Lenka Hámošová and Pavol Rusnák: *TroublingGan.* Photo from author's archive (2021)

This project is connected with the *CRITICAL DE?!GN / Designers Trouble Makers* exhibition not only by co-curator Lenka Hámošová or by interest in synthetic art, but also by the still-critical view recasting it as transition design, which explores new challenges for life in the very near future. In the exhibition, curators Lenka Hámošová and Katarína Balážiková focused on searching for new methodologies in designer theory and practice. In the process, they presented many domestic and foreign projects based on themes such as AI, digital systems, critical and transition design, or using them to communicate social, artistic and design issues. The projects from the *Critical Daily*

Blogzine were presented in the exhibition using posters and other visual materials communicating the activity of the relevant actants and their approach to treating the theme in question. The interactive website www.critical-design.com serves as an accompanying platform; in addition to mapping exhibitions and symposia on this subject, the website also allows users to participate by describing various methodological approaches in real time, with no space-time limitations in exhibition activity, and thus to use the digital platform to share and communicate creative questions.

In the exhibition *Neuročerv a stroje úniku* [Neuroworm and Machines of Escape], curated by Monika Mitášová, the Platform of Digital Arts of the Slovak Academy of Fine Arts and Design and the architectural studios of the Academy and of the Czech Academy of Arts, Architecture and Design came together to feature student work created to consider the questions connecting machine learning with artistic praxis. In the architectural work, AI was used as a think tank: a method of designing various versions of architectural sites and as a means of connecting the human world with mycelia. For their digital artwork, the students used machine learning as, for example, a means of creating visual material such as family postcards from the future (Natália Zajačiková) or as a tool for creating the textual components of a video about the future of social networks (Kristián Shofranko).

The double exhibition *AI & Art: PROTOTYP AI ART* took place in October 2022, in Brno's creative hub KUMST, and was curated by Jana Horáková. Works by Lai Man Tin, created using assisted creativity (simultaneously exhibited in the PRÉCÉDÉE Gallery in Hong Kong), Karina Kazarina's AI film and various images generated using Midjourney were all on display at the exhibition. The artist Lai Man Tin created his compositions, called *AI Brno* and *AI Hong Kong*, subtitled *A Collection of Memories*, by training a GAN model on 121 photos from the internet, with views of the cities in question. Tin's input to this generated imagery consisted of adjusting the training parameters and editing the photos. The dreamlike, fluid aesthetic typical for many GAN projects is used to represent hazy memories of the cities

and their visual intersections. The compositions, created exclusively for this exhibition, connect the local context of the relevant city with a global architectural scenario, highlighting the anticipated specificity and, at the same time, the universality of views of the city. In the videos *AI způsoby vidění* [*AI Ways of Seeing*] and *AI impresionismus* [AI Impressionism], Tin explores the synergy of visual perception and interpretation of art via human perception and visual analysis of neural networks.

Karina Kazarina's film, entitled *Rabínův sen* [The Rabbi's Dream], on the motifs of the Legend of the Prague Golem, was also part of the exhibition. The film was created by combining various phases of neural network involvement in filmmaking, that is, from the script to generating visual material. By using a thematic reference to a cult legend that situates an "animated" creature in Bohemia, Kazarina directs attention to the historical development of narrative myths associated with the development of intelligent tools.

On the stands, visitors could see different visual variations in how Midjourney was used to generate the visuals that a range of creators created over the course of three weeks. This colourful display of Midjourney prompts, specific in their resulting compositional stylization, demonstrated how the democratization caused by these generative tools can use any visual material to make anything visible.

The artists Gabriela Zigová and Zuzana Sabova chose an expressly conceptual approach when creating their exhibition, *Toto som už niekde videla* [I've seen this before], which ran in September and October 2023, curated by Lucia Gavulová, in the For maat gallery in Trenčín, Slovakia. They used Midjourney to create generations as one of the media in this physical, hypermedia exhibition; however, unlike the previous exhibition, the work with neural networks was in this case contextually connected with residual artistic artefacts and thus was itself one of the tools used for a specific purpose: reflecting on the porosity of the boundaries of artistic identity and highlighting collaborative praxis not based on a chance encounter between entities working on the same subject, but is rather the outcome of

a longstanding friendship. In the exhibition, their physical, artistic (work with physicality), social-group similarity is thematically presented as interchangeability, which is also striking in Jana Gombiková's photos, in which the artists adopt each other's identifying features and appear somehow artificial in their visuality. The focal point of the exhibition is the archive that the creators built as a joint personal archive consisting of various materials making up their personal and artistic identities, with particular emphasis on photos of them as children and adolescents. They trained Midjourney to generate images on precisely the basis of archive photos, but as it was a collaborative dataset, the results produced by the neural network merged their identities into one, which is often subversively different from the traditional representation of women (e.g., it has fewer fingers, or a disembodied embracing arm appears). The perception of a neural network as one of many media (in addition to generated images, there are also original paintings and installations of different materials on the floor, *objets d'art* in the form of a flowerpot or black sculptures made from soft fabrics, physical metonymies of the archive such as framed childhood photos and cupboards of objects, metal shelves with the artists' artistic and personal belongings, framing the space referring to a studio with three armchairs and a table, the artists' drawings and graphics, paintings by artist Peter Sulo, one of which was already created by a generative process, and photos by Jana Gombiková) provides the opportunity for a more detailed consideration of what neural networks can offer contemporary art, in particular, when it is used to substitute real photos, as they did in the album in which photos of their childhood and adolescence can be viewed side-by-side with generated images, or for one of the paintings, which is also a Midjourney output. Zigová created the soft black sculptures hanging in the space; their visual form was also generated by Midjourney, but the original images were a photo of Sabova's sculpture called *Čierna* [Blackness] and a photo of Zigová's work *Breathe*. Assisted creativity as used by Zigová and Sabova, with a new focus on themes such as involving technological tools as actants in

Fig. 11: Gabriela Zigová and Zuzana Sabova: Installation *Mamin Oltárik* [Mum's Altar] consists of generated and archived photos of both authors, presented at the exhibition *Toto som už niekde videla* [I've seen this before]. View into the exhibition at the For maat gallery in Trenčín, photo by Dušan Chrastina (2023)

their own artistic work and thematizing their impact on the entire artistic system, or reflecting on the boundaries of human creativity and identity, or the indivisible nature of the personal, artistic and social, are exactly the questions currently worth considering and that require innovative presentation methods. Human connection, through their friendship, their searching for and finding of similarities, sounded crucial in this context for establishing themes in a sophisticated and subversive, but also playful, fashion that resonates in the art world of today.

The Czech visual artist Julie Dítětová also builds on an approach specific to the digital humanities and, in her work, enriches it with a level of new media focused on visual combinatorics. Her project *Programming Patterns* was originally a MA thesis at the Academy of Arts, Architecture and Design in Prague, although it was later

expanded to include a live version, which the author presented at the Signal festival of visual digital technology. Additionally, a fashion collection derived from the generated patterns was created in collaboration with a fashion designer Aleš Hnátek. Therefore, it exists in three different exhibition formats: a web page, a gallery installation and a visual projection. The paratext on the web page states: "This started with a commission to create a website for an extensive archive of fabrics from the 18th century." Dítětová's work builds on the research project *Beauty Patterns* by associate professor František Svoboda of Masaryk University in Brno, where an archive of fabrics from the Brno Archdiocese was created. The artist created a dataset of 1105 manually modified square images from 6000 photos as the input dataset for training a neural network. Dítětová used the neural network StyleGAN 2, which is based on the transmission of specific styles, and consequently her experiment is strongly marked by the Baroque aesthetic and predominantly floral motifs. The original fabrics were produced on an invention that was revolutionary for the time, a jacquard loom that works on punched cards. In this regard, too, the author connects the historical technology of fabric with digital and computer history. The principle of punched cards as a "memory" for an automatic loom was also adopted by computer programmer Ada Lovelace and mathematician Charles Babbage. Not only was a huge number of images generated during Dítětová's project but so too were short videos, using other different digital functions, which the artist interconnects during the visual event, so individual patterns seem to morph into each other and dissolve, then new ones are created. During the projection, the visual symbols are shown on a screen with machine-sown generated symbols, so emphasis is also placed on the constant re-writing or transformation of real patterns via new digital visual material during the live performances. Such an impressive digital aesthetic preserves historical memory on the one hand, emphasizing the essential nature of the local context; on the other, the neural networks gave rise to precisely this contemporary, synthetic form, which is always trained on a specific form of historical

Fig. 12: Julie Dítětová: *Programming Patterns*. Photo from author's archive (2022)

pattern. Drawing attention to the evanescent nature of the historical pattern, which is what goes on during the live screening, contextualizes this project as the artistic output of digital humanities, highlighting artistic commitment.

In her project *affective metadata*, the Slovak photographer and visual artist Martina Lukić focused on the subject of the abuse of personal and private data in the household by smart technologies. The project consists of a website on which the artist describes, in meticulous detail, quoting theoretical sources and specific statistics, the reasons why the project was created, its stages and any reference situations that influenced it. The work was created during the Covid-19 pandemic and in it, the artist focused on the feelings of isolation, non-communication, loneliness and living every day with devices that silently monitor our lives, be they solo, or as a couple or a family. The artist used the CLIP model, which focuses on a combination of semantics between textual and visual materials, and thus can create images based on textual prompts or describe images using word constructions. CLIP, an acronym for Contrastive Language-Image Pre-Training, is an OpenAI model dating from 2021. Lukić trained

CLIP using her own photo database. The artist stated on her website www.affective-metadata.com that this series of visual material is "a resolution of a loop of reality fragmentation, its technical caption, its decoding, and recoding." Images on the website with a text description were not, according to the artist, generated only using textual prompts, but also as "interpreting the input photographs in a semantic way." This means that there is a loop between the artist's work, generated work, the semantic interpretation of what the technology sees and the evaluation's subsequent application to a synthetic medium. The description of a real photo, then, becomes the input for the creation of a fictional reality, which also documents the fictional aspect of our domestic inviolability and privacy that the project addresses. Lukić's project is numerically divided from 1 to 6, where items 4.1 to 4.18 constitute generated images in 18 different data collection tools with annotations. The typographic "comments" at the beginning of each chapter were created by the designer

Fig. 13: Martina Lukić: *affective metadata*. From the exhibition *Kronos* at the Blansko town gallery, curated by Júlia Bútorová, photo from author's archive (2022)

Alžbeta Halušková. These 18 examples include camera systems, voice assistants, vacuum cleaners, various smart appliances, online grocery shopping datasets, smoke detectors, smart cars, drones and doorbells. The other items elucidate the project's artistic, philosophical, technological and socio-political context. This project, with its oscillations and mutual influence between artistic and technical work with a strong socially committed approach, is an attempt to draw attention to the huge cloud of our private metadata, which we surrender willingly to technical companies via domestic appliances, albeit unconsciously and without any control.

THE INVOLVEMENT OF SYNTHETIC CURATORSHIPS

Lukáš Pilka's project *Digital Curator,* subtitled *Motifs and Themes in Central European Fine Art explored by Computer Vision,* which we have already mentioned, is based on the use of artificial intelligence in curatorial work, specifically when seeking identical motifs and themes throughout a historical period, primarily paintings in works originating in Central Europe. When a user visits the website www.digitalcurator.art/, they can choose to generate a random exhibition, where the introduction offers the opportunity to "Generate an exhibition across the collections of 91 art museums from Austria, Bavaria, Czech Republic and Slovakia", with a selection of motifs, periods and names. The exhibition *The Realms of Animals* was automatically generated for us; the accompanying text, giving relevant information about the data in this project, reads as follows: "6970 artworks from the years 1500–1900 displaying Animal, Dog, Horse, Bird, Cattle, Fish, Bird, Deer, Lion, Bull, Cat, Goat and Duck were assembled automatically by AI computer vision. The generated exhibition was selected from a collection of 196 116 artworks from 91 museums in Austria, Bavaria, the Czech Republic, and Slovakia in 0.86447 sec." The digital curator displayed the pictures with these motifs, the artist's name, the title

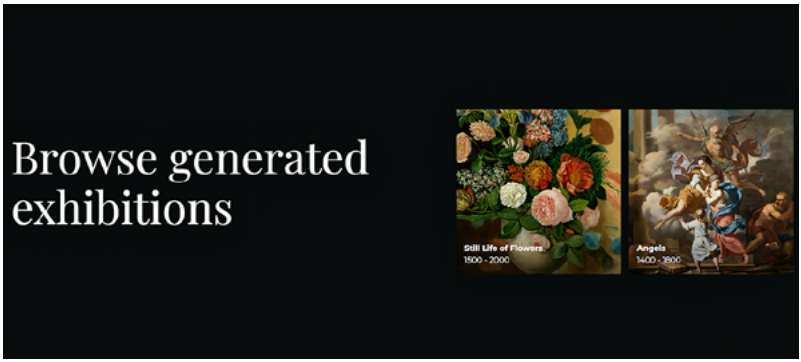

Fig. 14: Lukáš Pilka: *Digital Curator.* Screenshot from the website https://digitalcurator.art (2022)

and year and also divided individual pictures into rooms depending on the date they were painted. A list naming the fundamental visual symbols in the work, which also served as a link to generate more, was available for each picture. As the artist states in his study, in order to sidestep the limitations of AI pretrained on photos from 21st century America: "The digital curator therefore uses proprietary neural networks designed to classify motifs and symbols, with their skills extracted directly from historical paintings, prints and drawings." (Pilka 2022: 311). This project is a highly significant contribution to digital curation and, in the broader context, also to the digital humanities in our region, which is using neural networks fundamentally to influence work in curatorship but also in visual studies as a whole. Consequently, a huge database of reproductions is available to researchers, which they can use easily, more effectively and more comprehensively to find relationships, influences, shifts and contexts between individual works, periods and styles.

In order to zoom in and analyse the data in a much more specific archive, the Vašulka live archive[34] was created by a team of experts from different disciplines who worked on the project Media Art Live

34 VasulkaLiveArchive.net

Archive: Intelligent Interface for Interactive Mediation of Cultural Heritage, with a team leader Jana Horáková. This archive focuses on the audiovisual work of a pioneering Icelandic-Czech couple Steina and Woody Vašulka. When the website opens, a rotating ball with images of individual videos is displayed. Clicking on each little image displays information about the video and visualizations of the individual layers of automatic recognition of visual (created by Sikora) and audio objects (Miklánek) via neural networks and also predicts the specific categories the video will contain. The artists used convolutional neural networks to train a database of 1252 videos, which created 137 GB, although not all were by the Vašulkas and many were the same material in different copies. After selecting videos from the Vašulkas' workshop that could be presented on the website, the number of 124 videos was reached. This constitutes a set of their video art, video documentations of installations and video documentaries introducing their work. In this project, the neural networks were used to analyse videos in terms of specific categories of visual and audio content. These categories were of specifically selected "bespoke" works by the Vašulkas. As the project website states: "Using the outputs of both tools makes it possible to observe how the representation of objects by visual or audio signifiers is mutually supportive in these audiovisual works or how visual and audio objects convey a dominant position within the audiovisual experience." Given the semantic referentiality linking the use of technological tools with the work and the specific artist's intention, the words of Steina Vašulka, whose statement about her artistic series of environments called *Machine Vision* and *Allvision*, given on the project website with the mirror ball, seem essential: "These automatic motions simulate all possible camera movements freeing the human eye from being the central point of the universe." (Steina Vašulka: Machine Vision) This annotation seems to be a reference to a visual code that the artists used to display individual videos as a ball. The Vašulka live archive project, then, used neural networks and software tools, very sensitively, media-specifically and with the intention of presenting the work of

video artists in the most credible way possible, not only to present their work in all its breadth to a diverse audience, but also statistically to depict the metadata and parameters essential for curatorial, research and educational praxis (2022).

Fig. 15: *Vašulka Live Archive*. Screenshot from the website https://www.vasulkalivearchive.net

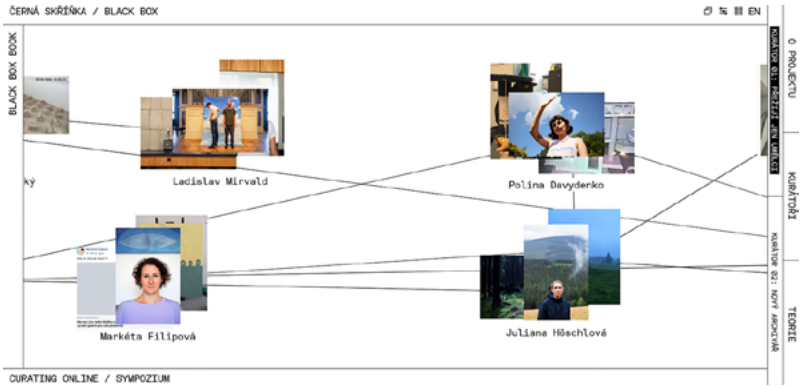

Fig. 16: Jana Horáková, Štěpán Miklánek and Pavel Sikora: *Black Box*. Screenshot from the website https://cerna-skrinka.cz (2020)

As stated by the same artists of another project with synthetic access to curatorial visual media, "The curatorial experiment New Archivist is a subversive gesture that addresses the current trends in the use of artificial intelligence in the field of art sciences and visual culture." (Horáková – Miklánek – Sikora 2022: 91). The live archive, in this case, was curated by a non-living agent, new archivist or alien curator, as the artists Jana Horáková, Štěpán Miklánek and Pavel Sikora called the artificial intelligence model created using an unsupervised learning method, which underpins the organization and visualization of the content material on the Black Box website. This model seeks out and organizes presentation materials by eight artists, who became part of the Black Box project during the Covid pandemic. The photos documenting their artistic life and work during a month-long residence organized by Galerie TIC in Brno, Czech Republic, are selected by AI from the database and grouped into their assigned visual folders under their personal photo. Therefore, on each visit, the website always shuffles the photos and displays them differently, so the visual content is consequently different. This sort of non-human organization of documentary content references the idea of a living archive as a place undergoing constant change. The New Archivist's approach opposes anthropocentrism and a certain cultural interdependence of traditional curatorial studies, and provides a purely statistical and data-based approach to a foreign agent that *ad absurdum* transcends the boundaries of the digital humanities, while at the same time enriching them with the technological perspective.

THE ARTISTIC VALUE OF SYNTHETIC ART

> *Therefore, the cultural and social acceptance of AI-generated artefacts will also depend on how much cultural capital (using Pierre Bourdieu's terminology) we will attribute to synthetic media of this kind or to the artist experimenting with them. It won't matter what such systems will be capable of generating, but what symbolic significance will be ascribed to their productions.* (Arielli 2022: 23).

It is clear from this quote from Emanuele Arielli's publication *Artificial Aesthetics*, co-authored by Lev Manovich, that the author places greater emphasis on the circumstances surrounding the works' reception (the perception of cultural capital) and the symbolic value that arises in the process of collective reception, than on the content created in this way.

With regard to the arguments about the cultural capital of synthetic media, the fact that synthetic visual works have been sold on the art markets for several years now is also an important fact today. The AI visual work *Edmond de Belamy*, from the series *La Famille de Belamy*, by the Parisian collective Obvious, printed on canvas, sold at Christie's Auction House in New York for USD 432,500 in 2018. Christie's came up with the primacy strategy, announcing that this was the first AI work in history available for auction, which probably contributed to this high sum. The work was created using a GAN and the title refers to the creator of this neural network model: Goodfellow, translated into French, is 'bel ami'. The model, trained on 15,000 traditional portraits painted between the 14th and 19th centuries from the online encyclopaedia WikiArt, is not innovative, either in its visual content or in its technical imaging, but in precisely the use of neural networks at a time when this opened the doors of the imagination to the place where visual culture influenced by synthetic possibilities was shifting. Now that people from entire spectrums of categories, social structures, levels of education and professions are generating visuals using online platforms such as Midjourney, GPT, Stable Diffusion and DALL-E, the value of these outputs is becoming much lower precisely because of their wide availability. Such approaches are therefore essential in visual art working with these technologies in an engaged, subversive and critical fashion, or are using them for socially beneficial platforms that make work easier for people in the cultural sector.

9

Intermedia and musical synthetic works

Synthetic materials have been used in various media projects for a relatively long time now, particularly in the sphere of artificially generated voices, which are used both in artistic projects and in commerce, where an unidentifiable voice is required rather than a specific individual. In this chapter, however, we will focus on projects not working with merely one generated medium, such as the huge number of audiobooks issued by Amazon and read by artificial voices, but on those focusing on a comprehensive use of neural networks, frequently also in thematic terms. Therefore, you will not learn the names of any generated rappers and pop stars, but we will present in more detail mainly experimental projects by trained musicians or artists in the Czech and Slovak scene who take a media-specific approach to machine learning. In the first section, we will introduce examples of projects from the world of music, and in the second, a number of intermedia projects.

On the music scene, neural networks are used in areas such as music recommendation, composition, lyrics generation, and music analysis. Streaming platforms like Spotify and Apple Music use neural networks to analyse users' listening habits and suggest new music based on their preferences. They are also used for generating musical compositions; some projects have attempted to create music in the style of famous composers (like Beethoven or Bach) using deep learning algorithms. AI-powered tools, such as OpenAI's MuseNet, or

Google's Magenta can generate entire musical pieces, allowing users to choose from different genres at the start. Neural networks are also employed to generate song lyrics, with some examples mentioned in chapter 5. Additionally, neural networks are used to analyse music for various purposes, including mood analysis, instrument recognition, and genre classification.

One of the first GPT-2 projects in the Czech arts scene was created in the field of music. In 2020, Český rozhlas [Czech Radio] completed a co-production of a sonata by Antonín Dvořák called *Z budoucího světa* [From the Future World], using a neural network. The AIVA (Artificial Intelligence Virtual Artist, the name given to the neural network) system even achieved the status of composer when the composition was performed by Prague Philharmonia. The network was trained on the basis of a data analysis of Dvořák's entire opus.

With the Indigo Quartet, the musician and musicologist Martin Flašar introduced a composition generated using OpenAI's MuseNet program during the HUMAIN 2022 festival. The concert had the witty title of *IQ + AI = ?: Indigo Quartet plays AI.* MuseNet uses the same technology as GPT2 and generates 4-minute compositions with ten different instruments, and is also able to combine different styles. Using assisted creativity, Flašar was able to create compositions ranging from serious music to pieces resembling Czech folksongs.

The creators of the music album *Lost Tapes of the 27 Club* trained neural networks using GPT-2 on the production of musician(s) who died at the age of 27. It includes generated compositions by Nirvana, Amy Winehouse, Jimi Hendrix and Jim Morrison. The group Over the Bridge, which was responsible for the album, wished to draw attention to the psychological problems that lead to suicide, and state on their website that "we used AI to imagine what these artists might have created, were they still with us." (see Krietzberg 2023)

The American artist and singer Holly Herndon, who has long worked at the intersection of music and technology, created the neural mode Holly+, which is trained on her voice using the timbre transfer process, although it is able to generate singing in many languages.

Herndon calls this process "spawning". On her website, she writes: "Meet my digital twin Holly+, a first of its kind voice instrument free for you to play and experiment with." The user can upload an audio file to the website https://holly.plus/and then Holly+'s voice will replace the voice in the original composition. The user can change the lowpass filter, the highpass filter, download the composition or share it. Herndon has also worked with neural networks in the past; on her album Proto (2019) she used a neural network trained on a number of singers, both male and female, for the vocals.

The Slovak musician and sound artist Slávo Krekovič has used machine learning and neural networks in multiple projects focusing on algorithmic musical improvisation in real time. When using the interactive system and the musical tool AMEN – AMbiguity ENgine (2019) – programmed with the language SuperCollider, the performer appears live in creative partnership with the software agent. Part of this is the neural network trained on the musician's expressive gestures – the movements of his fingers on the pressure-sensitive sensory surface, which continues to influence musical processes. An interactive system created in this way enables a dynamic change in the share of human and machine actants in the outcome. As Krekovič states, describing the *Black_Bots* project, in which he used AMEN: "The project's name is a tribute to Martin Bartlett's Black Box system but also references bots, the omnipresent autonomous software agents." (Krekovič 2019)

In another instance (e.g., the appearance in a trio with Rie Nakajima and Piotr Mełech at London's LightSounds festival in July 2023), Krekovič uses a neural network directly generating real-time audio as part of an artistic practice called algorithmic improvisation. The RAVE model, trained on human voice samples, makes sounds based on input parameters that are influenced by the musician using sensors during the performance.

This is currently one of the user-accessible models with web applications for directly generating music that does not need to be trained, similar to BeatBot, which creates a musical link and accompanying

words that are displayed on the page on input of a textual prompt. Google MusicLM, OpenAI's Jukebox AI, AudioLDM and Riffusion all function similarly; however, they only create musical compositions without emphasizing the words (lyrics) aspect, and these compositions mostly sound like generic electronic muzak. Other musical web interfaces based on neural networks, where users choose from individual parameters (mainly musical genre and mood) and consequently obtain generated tracks that they can then tune, include Soundful, Soundraw, Ecrett, Boomy and Beathoven.

INTERMEDIA AND TRANSMEDIA PROJECTS

The topic of neural networks, in addition to expressly visual art, resonates in the Czech and Slovak cultural context in other disciplines that fall beyond the focus of our book, but we can at least mention a few names. Kristína Rypáková conducts research on architecture modelled via neural networks, Filip Paldia on creating and generating automatic fonts and Helena Lukášová deals with sculpture generativity. The topic and presentation methods of synthetic art and scientific questions that resonate here are frequently also explored via the Uroboros festival in Prague, or the HUMAIN conference in Brno, which focus exclusively on synthetic art, or art and science festivals dealing with digital art, such as Sensorium in Bratislava, Signal in Prague, Biela noc [White Night] in Bratislava and Košice, among others. In this chapter, we will primarily focus on projects with a narrower artistic nature that were created as the result of collaborations in multiple media, of which neural networks were only one.

In the initial generation phases using GPT-2, the creators also found uses for computer games and AI Dungeon, by Latitude, became an interesting and relatively well-known game. This game imitates the style and gaming mechanisms of old text games. The players enter commands into a window that launches textual continuations of the

game. At the beginning, players can choose from several fictitious settings based on a specific genre and, as the game evolves, it takes place on the basis of any user inputs. As the accompanying trailer states: "Your imagination creates details, and the AI continues your tale. Together, you and AI bring your stories to life. Endless hours of collaboration. Infinite possible outcomes." The invitation to see the fictitious space in the first person and, at the same time, be the scriptwriter or director who follows the neural network inputs, resembles literary works with assisted creativity; however, in this case it is supplemented by visual material and embedded in player strategies. The very name refers to Dungeons & Dragons, the fantasy role-playing game from the 1970s, which significantly influenced the gaming industry and community. Latitude also created the Voyage platform for other AI games (AI Art, Medieval Problems, Loom, Things); it is intended to unify the gamer community and offer the opportunity to collaborate playfully with AI. It was precisely the emphasis on gamer creativity and game development in an individual direction for each player that made AI Dungeon a favourite when work with GPT was only just beginning in the creative industries.

The project *Umelá neinteligencia* [Artificial Unintelligence], by the Slovak artist Samuel Szabó, which we have already mentioned, can be viewed as a media project on which the artist has been working since 2017. He initially trained his RNN on corpora composed of discussion entries from the Slovak internet, and later also on books. He deliberately selected discussions under articles on burning social topics (including migration, the Roma and the far-right People's Party Of Slovakia). Two fictitious posters, whom he named Boris Kukolár and Andrej Dadanko, were created in this way. As with his text projects, the network was again trained on an insufficient quantity of data, so the resulting replica discussions seemed plausible at first glance (including the characteristic use of punctuation, exclamation marks, emoticons and the like), but are entirely incoherent in semantic and grammatical terms. This of course did not stop Szabó from inserting them into real, ongoing discussions and thus undermining them.

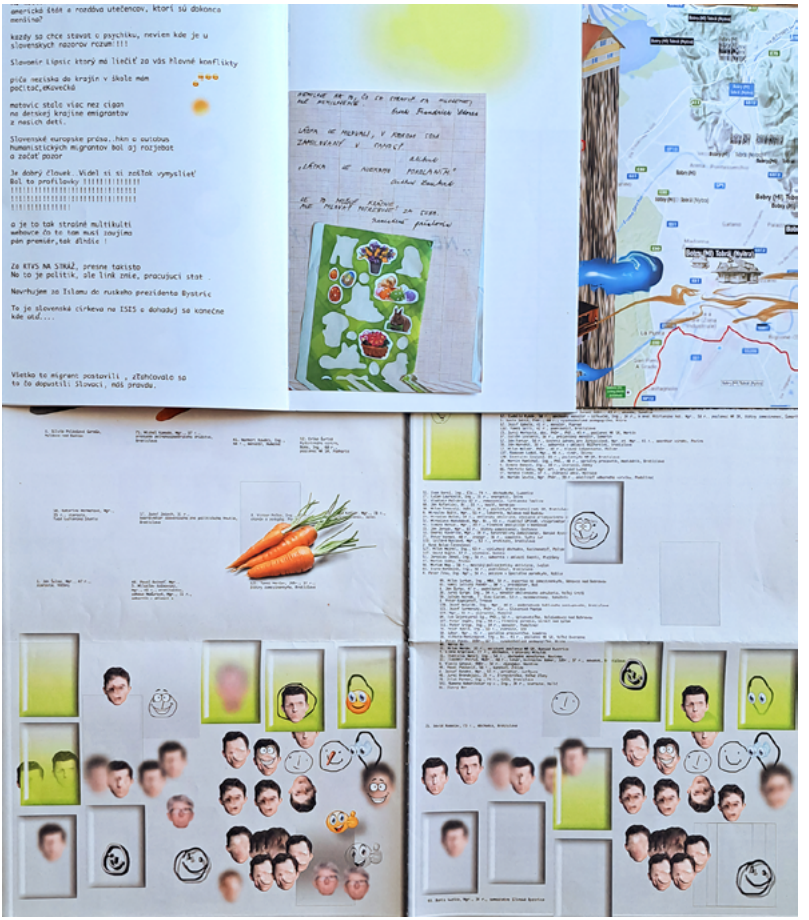

Fig. 17: Samuel Szabó, author of the concept and text, Lucia Repašská, author of the design: *Svet sa nám nestal* [The world did not happen to us]. Photo by Zuzana Husárová (2020)

The transmedia project *Svet sa nám nestal* [The world did not happen to us], which Samuel Szabó released in winter 2020, consists of a music album with dozens of compositions as well as a visual book with a broad spectrum of genre texts. Lucia Repašská, the Slovak theatre director and theorist, was involved in the visual side of the book and transformed it into a unique literary object: the book's formal

and visual solutions are exactly what enhance the themes raised and showcase the playfulness, comedy and subversiveness of the generated texts. The book consists of six heterogeneous sections, each of which presents a different RNN model, has a completely different textual and visual style and comes under a different genre category. These sections are: Andrej Dadanko: the people's internet poster; St Theodore vs Google Translate: when the world is terrible; Majk Spirit: Motivational quotes; candidates – the party's candidate list of mayors and independent candidates for the 2020 parliamentary elections; Geographer: names of Slovak municipalities, and the publishing schedule. The book's first section consists of Andrej Dadanko's generated discussions, which in the first phase were inserted into internet posts; in the book, however, the inventive graphic processing and the inter-combination of generated texts produce a comical-satirical situation with a strong political undertone. The inventive ending to the section is "space for my creativity", that is, a representation of a lined notebook with an image of the sun, created by Lucia Repašská. The second section, St Theodore vs Google Translate, was created on the basis of semantic shifts during automatic translations between multiple languages. Here, the visual side more than anything else resembles traditional poetry books: the author's name (most often the real Romantic writers Janko Jesenský, Svetozár Hurban Vajanský, or various word games for other names), the poem title and poem are stylistically based on the works of Slovak Romanticism on which the network was trained. Although the poems are frequently nonsensical, they evoke classic Romantic poetic images and describe heroes, kings, nobles, pagans and other figures and so recall the cult poems of the great Slovak Romantic poets. They often use terms such as Slovakia, nation, glory, world, which may in isolation refer to heroism, but the poems as a whole undermine nationalist values by being nonsensical.

Majk Spirit's motivational quotes are inserted into different places in the book, in the form of five handwritten postcards and children's stickers depicting animals. Majk Spirit is actually the name of a Slovak

rapper. The postcards always include several comic or absurd quotes with a real or invented author's name, such as: "Women never bring words," Lucius Chralovič Nietenec or "Iba mlčanie" ["Only Silence"], Johann Wolfgang von Goethe. The fictitious candidate list consists of four pages containing generated names and details about the fictitious election candidates with some photos graphically altered *ad absurdum*. Szabó also targeted the field of toponymy when he had the network generate the names of fictitious towns and hills in Slovak and Hungarian and put them on maps of Slovakia. The publishing schedule consists of 51 generated names and publications, which were "compiled by: St Theodore". The book, then, is an intermedia practical joke that uses an asemantic, incoherent text to subvert nationalist, political and romantic ideas.

The compositions, published on the *Umelá neinteligencia* project website, were created by generating WAV files using an RNN model. The titles of the freely accessible ten compositions refer to the genre affiliation (mass, wild strawberry), the composer of the original music files (Stašák, Dežo, čipovaný [chipped] Nagy, Mirino & Drahomíra, Raptor, abuliazmus), the original compositions (malé koníky [little horses]) or the albums released (zelená pošta [green post office]). Szabó's political, subversive and provocative thumbprint is evident in this musical alternation too. Each track begins with a few comprehensible words, which then, after a short introduction, become an incomprehensible tune that always belongs to the singer whose recordings Szabó used to train his model. The outcome is music that reflects cultural reference tones, but at the same time uses generation to mix them into new relationships. The oscillation between the familiar, even the cheesy, and the new aesthetic of synthetism creates comic to absurd reception situations which are further intensified by the eclectic selection of performers with a clear emphasis on parody.

Szabó's eclectic media praxis is also dedicated to clarifying his own creative principles, which may be captured, for example, in his podcast for 3/4 magazine, in which he describes different music generation models via the sound material he used in this album.

The German duo Marcel Karnapke and Björn Lengers, who create under the name CyberRäuber [CyberRobbers], are responsible for several digital projects linking performance, theatre and digital technologies, particularly neural networks and virtual reality. The first part of their project "social virtuality – Theatre in der digitalen Realität" [Theatre in the digital reality], on which they collaborated with the theatres Landestheater Linz and Badisches Staatstheater Karlsruhe, and called *Fragmente – ein digitaler Freischütz* [Fragments – a digital poacher], is described as a VR opera. The second part of the project is *Prometheus Unbound* from 2020, a multimedia performance on which the artists worked with neural networks. The actors on stage are surrounded by constantly changing generated texts, images and sounds, they respond to them and contextualize this cultural synthetic material in the live performance.

The project *Frankenstein AI – a monster made by many* also addresses a new approach to digital performance using neural networks. The project was launched during the 200th anniversary celebrations of the cult novel *Frankenstein* by Mary Shelley. According to the accompanying text on the project website, Frankenstein in this performance is "a naive, emotionally aware, and highly intelligent 'life form' – an artificial intelligence". The project, which Rachel Ginsberg, Nick Fortungo and Lance Weiler created in partnership with Columbia University School of the Arts' Digital Storytelling Lab, links a "series of activations and experiences both online and off, that will traverse immersive theatre, browser-based interactions, community design, and other performative and experiential media." This participatory installation and performance is based on direct, live communication between the participants during the project – between themselves in the process of collaborative storytelling and as inputs for the neural network generating the answers live. It contains multimedia that have the task of communicating about humanity, or the options for AI and its future. In addition to the communication level established using interactive design, the performance also includes the dance of a female performer; her body is meant to represent the physicality of

AI and to respond to the generated outputs in movement. The project's second announced phase is to be *A Dinner with Frankenstein AI:* "immersive dinner parties that mix storytelling, conversation, food and AI."

The intermedia project *Pro(s)thetic Dialogues* by artist Alexandra Moralesová and Georgy Bagdasarov, a media artist of Armenian origin who is based in Prague, was presented particularly in the Czech cultural context. The project was created during the Covid-19 pandemic and gradually went through several digital forms. Firstly, it was a recording of a theatre performance for a desktop computer, then a 24/7 non-stop video stream. The project was presented as a generative installation at the Kiosk festival in Žilina, Slovakia, in 2022, and became an experimental film in its final form, which is mainly screened at festivals. On the screen backdrop (with an obviously generated image of a mountain range that vanishes at the end of the film) several windows open, critically debunking the generation process as a quick way of finding effective answers and revealing the technological processes leading to the resulting output (prompt triggers, searches and clarifications of terms, soundtrack processing or code debugging), and indeed various philosophical considerations associated with the theme of technological (non)creativity. For these reasons, the work acts to deconstruct the fluidity of generated content creation, instead focusing attention on the very structure of the media narrative. The neural network was trained on texts by 17 philosophers from the second half of the 20th century to modern times, from Hannah Arendt and Günther Anders, through Gilles Deleuze and Donna J. Haraway to Peter Sloterdijk and Slavoj Žižek. The audience witnesses the fluid transformation of a synthetic face, which also embodies the voice of the trained discourse. The facial appearance was created through StyleGAN interpolation of visual representations of Günter Anders and Hannah Arendt, with an injection of texts that are "speaking" at that specific moment. The tone of the voice is derived from a blend of datasets containing the voices of Arendt and Anders, supplemented with traces of voices from various birds and animals.

This project uses a subversive approach to raise questions about critical dimensions in the perception of generated textual and visual content, but does not provide simple evaluative judgements, rather leaving the spectators to create their own perspectives. Performative, creative prompting is here depicted as a process that allows the audience to familiarize themselves with the "mycelium" underlying the creation of a generated audiovisual work containing multiple layers.

Databáza neistôt [The Database of Uncertainties] became a performance, using an intermedia version to process the original book in the Slovak cultural context. Directors Emília Šavelová and Alena Váradyová rehearsed a performative remediation of the book *Výsledky vzniku* [Outcomes of Origin] with the Anton Cíger Elementary Art School in Kežmarok, in collaboration with the Poprad Elementary Art School. The performance, by 14 young actors and actresses, was presented in the Slovak national recitation competition Hviezdoslavov Kubín in June 2022. All utterances on stage come from a montage created by combining individual lines or stanzas from the original book; the title was likewise selected from a poem. The set consists of hangings

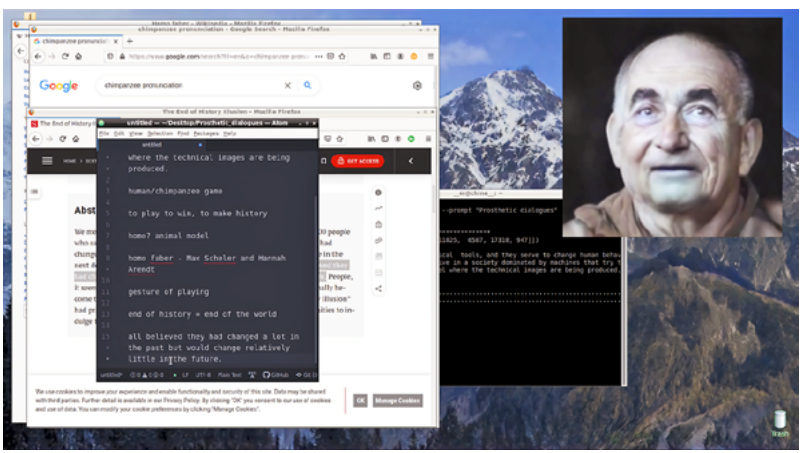

Fig. 18: Alexandra Moralesová and Georgy Bagdasarov: *Pro(s)thetic Dialogues.* Photo from author's archive (2022)

of translucent fabric, which are used in a shadow-play of bodies in the introduction. Text or an image of a forest is projected onto them in some parts of the performance; in others, the cast wrap themselves in them. In addition to the cast on the podium, who recite individual lines as a polyphonic utterance, recorded voices put the finishing touch to the auditory space by singing, talking or melodizing sounds or words. The sound of a typewriter can also be heard. This montage directs the attention to themes that resonate with the contemporary young generation, such as the human existential plane, the human body, the value and uncertainty of the future, the complexity of relations to others and to oneself, position in society and the meaning of an individual's efforts. The generational level of the polylogue is highlighted by the recitation of lines by teenagers; this was completely absent from the original book. The performance of a dramatic text of this type, based on a thematically diverse poetry book, thus creates a different effect in terms of audience reception. The montage principle, to create a drama from a generated text, is most appropriate, because the final composition of the book, as a process, consisted of selecting individual poems that were generated using the same key word. The performance also works with the theme of automation using roboticity to evoke the movement of the actors' bodies on the stage, as well as in handling their voices to evoke a generic effect. When this stylization comes to an end, the actors declare, as a counterpoint: "Ja nie som robot. Ja nie som anjel. Ja nie som žena, vďačná a celkom tichá, ako to robia rodičia." ["I am not a robot. I am not an angel. I am not a woman, grateful and entirely quiet, as parents do."] In the conclusion, in which an actor and two actresses with varying diction and tempo repeat the sentence: "Nádejný význam sa zdá byť v závislosti od jednotlivca k jednotlivému ja" ["The hopeful meaning seems to vary from the individual to the separate self"], the repetitive nature of one text is highlighted using three monologues, with subsequent emphasis on creating the conditions for a variable reception, arising from the method by which a synthetic text may also be performed.

Fig. 19: Emília Šavelová and Alena Váradyová: *Databáza neistôt* [The Database of Uncertainties]. Screenshot from the video documenting the performance (2022)

In her project *aixcuse.me*, the Slovak interdisciplinary designer Dominika Čupková focused on the feminist theme of unnecessarily apologizing in different situations. She drew inspiration from the status of user NihachuEatsCats, who on her social media challenged people to "type 'I'm sorry for being' and let your keyboard finish it for you". The fact that it was primarily women who responded to this challenge and that this phenomenon is widespread, particularly in women, forced Čupková to view the situation from the social perspective. *Aixcuse.me* is based on the GPT-2 model, which displays a different generated continuation of "I am sorry for" online each time the space bar is pressed. GPT-2 generates a different text design – that is, a different font and colour, and the coloured background also changes. In this project, both humorous on the one hand and critical of social constructs on the other, the interconnection between neural networks, design and feminism proved to be a suitable approach for rapidly and effectively disseminating a point of view. The conceptual approach, based on the principles of Flarf or Google Poetry characterizing a semantically absurd textual statement, becomes in this way

Fig. 20: Dominika Čupková: *aixcuse.me*. Screenshot from the website https://dominikacupkova.com (2020)

representative of the absurdity of the persistent psychological need to apologize. Frequent, unnecessary apologizing is also related to lower professional status, a theme that social feminism is also concerned with. Using neural networks to promote a feminist position helps playfully to unmask the circumstances that, when torn out of context in this way, emphasize the nonsensical nature of these psychological mechanisms. Apologies such as "I am sorry for being so sad" or "I am sorry for being a bitch", although they may not seem very creative in terms of text creation, still appropriately represent the declared theme.

The Czech project *Aignos* also highlights the educational level of working with neural networks. The project's web presentation emphasizes the slogan "originální vzdělávací aktivity na podporu gramotnosti o umělé inteligenci" ["original educational activity to

support literacy in artificial intelligence"]. The project organizes events for schools and different communities that are meant to stand on three pillars: digital literacy, critical thinking and creativity, and work by explaining artificial intelligence with attempts to use it creatively. The outcomes of these school workshops have been shared online as a Gallery of AI art, where the images are shown automatically and, when clicked on, display information about DALL-E, the creation date and the title with no artist. Aignos presented generated images of Kafka, Shakespeare, Picasso, Beethoven and Karel Čapek in the municipal art gallery in Chomutov, Czech Republic, and at the railway station Chomutov-město; using Midjourney, it also created a visual identity and became a partner of the already mentioned theatre project PLaiPRAGUE. The AI personas that the company uses to provide the opportunity to talk to AI are also an essential element of the project. An AI president, Professor Digital, an AI artist and Superheroine are stereotypical representations of AI profiles intended to hold dialogues with the users. In marketing terms, a particular mark has been made by AI President, whose voice could be heard over the ether of Czech Radio Plus at the time of the Czech presidential elections. The use of neural networks as psychological assistants with a range of different profiles has boomed in the last year.

The projects mentioned and analysed in this chapter are a good representation of the interdisciplinary and intermedia nature of creativity that exploits the possibilities of artificial neural networks; however, this does not mean that transcending the boundaries between the arts and even between entire areas of cultural and scientific creation (demonstrated here in projects overlapping the fields of education or psychology) is characteristic of a specific range of projects. Quite the opposite, in fact. In this chapter, we wished to demonstrate that being intermedia and interdisciplinary is an inherent, maybe essential characteristic of generative neural networks (the project *Umelá neinteligencia* is probably the best example of this). At the same time, the finding that neural networks are not merely a technological tool or even a new generation of software, but a phenomenon

with distinct culture-creating potential is confirmed here even more than elsewhere. This is precisely why we have positioned neural networks in the centre of our concept of the culture of artificial neural networks, because we wish them to affect what is going on within the cultural formation driven by precisely these technologies. This formation transcends the boundaries of traditionally limiting individual cultural disciplines and brings new opportunities for interdisciplinary collaboration and intermedia creation. At the same time, however, it may arouse the fear that "artificial intelligence" is preparing to seize control of the entire cultural space – the interdisciplinary character of neural networks, then, may also negatively contribute to mythologizing them. This, of course, is not the fault of the neural networks themselves, but of the humans who are playing language games around them; games that ultimately constitute the culture of neural networks. And we must acknowledge that these language games are not always entirely correct, but are co-determined by utilitarian interests and do not always faithfully reflect reality. Precisely these media and presentation strategies associated with the culture of neural networks will be the focus of our next chapter.

10

Presentation strategies for synthetic textual media

Our critique of the concept of "artificial intelligence" is to a significant extent based on critiques of the mythologization tendency associated with it, that is, on a critique of those parts of language games that co-create CoNN, which tend to fog the basis and real contours of new cultural phenomena, thus preventing an appropriate reception for the artefacts and cultural processes elicited by the presence of artificial neural networks in culture. Many of the characteristics of the reception processes connected with neural network literature are, of course, foreshadowed by the method in which these projects are presented to the reading public and how they are promoted. In more than one case it is even impossible to separate the presentation paratext from the reception metatext, because projects are usually associated with a professional advertising campaign, which leads the media to adopt arguments, metaphors or entire passages of text from the press releases or other sources. In the projects *Digitální spisovatel* [Digital Writer] and *AI: když robot píše hru* [AI: When a Robot Writes a Play], it can even be reasonably assumed that the marketing intention could also be the initial driver in bringing the project to fruition.[35]

35 The projects *Digitální filozof* [Digital Philosopher] and *Digitální spisovatel* [Digital Writer] can also be seen as a PR and advertising campaign by the start-up Alpha Industries, led and owned by programmer Jan Tyl. This start-up, founded in 2018, is obviously seeking to be a significant player in software services that

The tendency to use consistent marketing presentation strategies is relatively common for projects of this type (and not just for Czech and Slovak projects). There are even two basic presentational procedures in the sample of (Czech and Slovak) projects analysed in the previous chapters, and these procedures differ from each other in their degree of fidelity to reality. On the one hand, there are the projects for which the presentation is a professional marketing campaign, which tends to over-value the project outcomes, and conversely, to hide its deficiencies. On the other hand lie the projects that, by contrast, acknowledge the imperfections in their outputs, do not evade comparisons in the broader supranational and diachronic contexts and present their outcomes to the public as irritating artefacts, not commodities. However, partial communication strategies pass through these general procedures and may, in isolated cases, have different connotations, including value connotations.

ANTHROPOMORPHISM

An absolutely fundamental presentation strategy is the anthropomorphism of machines/software/neural networks and the like. The creators of the projects *Digitální filozof* [Digital Philosopher] and *Digitální spisovatel* [Digital Writer] are proceeding in this direction entirely without restraint. They have assigned cognitive functions (such as "understanding", "machine thinking") to their systems, and speak of them as "virtual personalities" or even "digital people". This

use machine learning. The projects *Digitální filozof* and *Digitální spisovatel* are among the first projects by this start-up; public attention has not yet been caught by any other application. The project is, in fact, non-commercial and is intended to bring the company to general awareness, improve its market position, obtain the necessary testimonials, and so on. The most attractive presentation, not the text result, is what is important here (the texts are presented by digital avatars with human voice synthesizers, or similar). Tomáš Studeník, who initiated the project *AI: když robot píše hru* [AI: When a Robot Writes a Play] also definitely had no ambition to become a creator of generative literature. He initiated and promoted the project to reinforce his image as a "radical innovator", which he uses to advertise consulting services to commercial clients.

humanizing strategy, then, entirely disregards the fact that the concepts of "personality" or "person" constitute a highly comprehensive entity, and conversely, that an artificial neural network is merely a reactive algorithm with which a conversation may, to a certain extent, be held, but this discourse is of necessity very mechanical, and definitely does not display the imprint of a "virtual personality", but is rather an image of the statistical average arising from the training corpus. Animate grammatical endings are then used for the software systems, as is the relevant deixis (he/she), to represent anthropomorphism linguistically and grammatically. Nevertheless, anthropomorphism is an entirely natural communication figure and, when applied, is not necessarily purely manipulative for example when it is associated with an acknowledged mystification game or neo-Dadaist subversion (as in the case of Liza Gennart or the project *Umělá neinteligencia* [Artificial Unintelligence]).

HYPERBOLE

The *Digitální filozof* project is presented on the start-up Alpha Industries' website in these words: "Bill Gates introduced the operating system MS-DOS 14 000 days ago. Steve Jobs introduced the iPad 3 303 days ago and 16. 12. 2019 Alpha Industries, with the cooperation of students from the Faculty of Philosophy, introduced a digital personage! During 3 months, five student teams were educated in contemporary philosophy and artificial intelligence. Using state-of-art artificial intelligence and our expert lead, the teams achieved to create digital versions of famous philosophers and showcased them to the public. This project was realized in cooperation with Faculty of Philosophy, Charles University represented by the amazing Dita Malečková." (*Digitální filozof* 2019). In the associated video of the project's public presentation, Tyl and Malečková even talk about working with "advanced artificial intelligence", which does not in fact correspond to reality, because none had been developed at the time. They proclaim the start of a new phase in the relationship between people

and machines. The exchange (intentional or otherwise) of visions and facts is, then, part of this strategy. Basic slogans such as "written by artificial intelligence" or "work on the script was entrusted to a computer" are mythologization strategies, which imply the alleged autonomy of these systems and sideline the tasks of the human actants in the text generation process.

NOVISM AND PRIMACY

A neo-avantgarde accent on the novelty of the text-creation procedure, even the primacy of the creative team in the given field, is frequently part of how these projects are presented: "January saw the 100th anniversary of the world première of Karel Čapek's famous drama *R.U.R.*, in which the word robot was used for the first time. A team of Czech scientists, theatre performers and innovators decided to celebrate this major anniversary by launching the historic first play written by artificial intelligence (AI)" (Šolcová 2021). These words, from the presentation of the *AI: když robot píše hru* [AI: When a Robot Writes a Play] project, appeared in a text by a *Deník N* reviewer with only small variations: "The acclaimed play *R.U.R.* is celebrating its 100th birthday, so what if we were to let a robot write a play? This was the initial impulse of the team composed of mathematical linguists and theatre performers, who helped the first play written by artificial intelligence into the world" (Mikulka 2021). He also commended the primacy of the Švanda Theatre that put on this play: "Prague's Švanda Theatre is entirely entitled to pride itself on being the first ensemble in the world to study and produce a play written by a robot" (Mikulka 2021). The project presentations of *Digitální spisovatel* and *AI: když robot píše hru* are contextually very poor, meaning that it is not uncommon for mass media to pick up on this inaccurate or outright misleading information regarding the primacy of the creators in the given field. Nevertheless, evidence of productions earlier than the première of *AI: když robot píše hru* is not difficult to find. For example, the play *21 Visionen für das 21 Jahrhundert*

[*21 Visions for the 21st Century*] premièred in Graz, Austria, on 21 October 2020; the play uses several forms of machine learning including the language model GPT-2. As early as June 2019, the NRW-Forum in Düsseldorf staged the interactive drama *Humarithm*, in which artificial intelligence collaborates with the audience and attempts to answer the question of what it means to be human (the thematic similarity to *AI: když robot píše hru* is evident).

SPECTACULARIZATION

Spectacularization is a presentation strategy in which the emphasis on attractive presentation that flatters the project is clearly visible, the standard publication of a text with the project outputs is sidelined and conditions are created to minimize both the flaws in the generated texts and any queries on the successfully achieved results. This is easily seen, again, in the *Digitální spisovatel* project, where the outputs are published primarily in audio form on Czech Radio's website. The texts are presented by professional actors and their written form is not available. Other times a digital avatar is used, or animated human faces are combined with a voice synthesizer to promote the impression that an artificial human being exists.

SECONDARY / PARASITICAL CANONIZATION

Some generative projects reinforce their credibility and significance by establishing links to canonical authors and works. This strategy has a major role in the project presentation of *AI: když robot píše hru*. The presentation's leitmotif is Karel Čapek and his world-famous play *R.U.R.*; from the outset, the project was aiming to mark its 100th anniversary. This, of course, is not the only canonization link in this project. The authors repeatedly describe the generated play as an analogue of *The Little Prince*, which again is a reference to the positive

mood and interest evoked in the general public: "The result was a set of dialogues, which in the Švanda Theatre were arranged to tell the full story of a robot journeying through human society. This may resemble a futuristic version of *The Little Prince*."[36] In the case of the *Digitální filozof* project, it was again a link to world-famous thinkers. This secondary canonization functions as a complementary strategy to the strategy of novelty and singularity – it gives the impression that past and future meet in the given work.

CONTEXTUALIZATION

This is a strategy that directly promotes the playful aspect of literary metareading. For example, the project framework for *AI: když robot píše hru* mentions that it is an absurd drama. In many cases, reviewers have adopted this genre reception grid. The language and plot flaws were thus connected with a context in which they could not matter, and the audience ultimately accepts them as the text quality artistically intended. The creators, by defining the genre in this way, *de facto* lead the recipients of their work to a literary metareading.[37] The creators of the Liza Gennart project proceeded in a similar fashion when they presented their fictional poet as the author of feminist works (the variation in grammatical gender was, in one stroke, justified). Contextualization, however, need not be at all intentional, but

36 This quote comes from a press release issued by the project creators and was borrowed by the website *Proti šedi* [Against the grey] (Umělá inteligence…, 2021), for example. The direct link to the reception metatexts and the contextualization contained in them is clear even from the headline printed in the Czech daily *Mladá Fronta Dnes*: "A play about a robotic Little Prince was written by a computer" (Šťástka 2021: 10).

37 This principle also applies to expertly based reception metatexts; for example, the reviewer of the journal *Svět a divadlo* [World and Theatre] gives a negative answer to the basic question of whether a robot can write a play (because it can only produce a short dialogue), but as soon as she began to see the play through the lens of the drama genre (absurd drama, Dada), her evaluation of the play as a successful grotesque was actually positive (see Lesch 2021).

entirely factual, as is the case for the *Umelá neinteligencia* [Artificial Unintelligence] project, where the creator appropriately presents the work within the context of conceptual art and generated literature (as, indeed, do the creators of *Výsledky vzniku* [Outcomes of Origin]).

ACTUALIZATION

When presenting a project, the creators also respond to what is currently ongoing in society and to social demands, for example when they ask the *Digitální filozof* what Václav Havel would say to the removal of the statue of Russian general Ivan Konev in Prague (see the title of the interview with Jan Tyl published in *Flowee* magazine: "Havel would not wish Konev's statue to be removed, says artificial intelligence promoter Jan Tyl", Tyl 2021). These actualization strategies may also have an ethical dimension, as is the case for the *AI: když robot píše hru* [AI: When a Robot Writes a Play] project, which is presented as a way to stimulate a social discussion about artificial intelligence and its potential and risks: "We want to start a conversation about what robots of today can and cannot do and where they should and should not be used" (Rosa 2021).

MYTHOLOGIZATION

As part of the *Digitální filosof* [Digital Philosopher] project, the computer allegedly generated "prophecies" or created a digital variant of Dita Malečková's ego.[38] *Digitální filosof* is purportedly able to "call up the philosopher in question" and "conduct a dialogue with a dead thinker" (Kultová 2020), as if the authors had successfully crossed the boundary between life and death (they are seeking to "revive people who are no longer with us"). A part of this mythologization strategy is a specific step towards spiritualism, or even directly towards

38 see the video of the public presentation of *Digitální filosof* https://youtu.be/R1VU5jJ00mg?si=h_QC5bJQjr1Qpsrn, 2020.

demiurgic gestures; see Jan Tyl's statement: "we can create anyone" (*Jak funguje…* [How… Works] 2020). Rarely does a mythologization strategy involve the creators mythologizing themselves, and this is perhaps only possible due to the lay nature of the audience to whom the creators are talking at the given moment (for example, Jan Tyl, when he says of himself that he created his first neural network at the age of 12; *Jak funguje…* 2020). Self-mythologization may, of course, also work in the opposite direction, that is, it may be intentionally depreciatory – as in the case of Samuel Szabó, who states that he generates his texts on the cheapest laptop on the market (which is entirely in tune with his overall punk stylization): "So, even the absolute cheapest laptop on the market, which I have, has to run for two days even for primitive textual results" (Szabó 2021).

11

Reception mechanisms for synthetic textual media

Now we come to the issue of the reception, or more accurately, the specific method of reading texts generated by artificial neural networks. The fundamental difference between the reception of generative and non-generative literature was formulated by Jean-Pierre Balpe in 2005, in his article "Principles and Processes of Generative Literature. Questions to Literature". At the time he understandably had a different perception of the notion of generative literature, lacking any experience with sophisticated and successful technologies of neural networks and large language models. He was unable to confront his theoretical assumptions with concrete receptive metatexts, since at the time computer-generated texts were still in an experimental phase, not reflected by the wider literary community. Today, we have this opportunity, and so our considerations of the specific mode for reading this kind of literature can start with an analysis of the metatexts.

In the receptive metatexts thematizing and evaluating the aforementioned Czech and Slovak generative projects, two basic strategies can be identified: 1. a description of the generation process and a generalizing reflection on the fate of literature in the era of artificial intelligence; 2. a reflection on the process of reading the generated text and an attempt to take an evaluative stance on its literary quality.

The first of these strategies clearly dominates quantitatively; often the whole text of the review is built on this principle; in fewer cases, both strategies are combined on the surface of one metatext. A prominent rhetorical figure within this strategy is the expression of concern that writers will be replaced by artificial intelligence. This creates a spectacular emotional arc, as it is regularly followed by reassurance – often backed up by statements from the writers themselves – that an artificial neural network is likely to be a tool to help writers rather than compete with them.[39] This apocalyptic mode of reception is evident, for example, in the title of a review describing the *Digitální spisovatel* [Digital Writer] project: "The end of writers in the Czech Republic. Even artificial intelligence can write short stories." The reviewer makes do with the mere fact that the originator of the texts in question is supposedly a machine, and makes no mention of the linguistic or literary quality of the stories (see ajez 2020). However, this emphasis on aspects of technology and values is not relegated solely to the domain of ordinary and relatively ill-informed journalism, but can also dominate theoretical texts. In these types of literary metatexts, poetry is not presented as an aesthetic object, but rather as a stimulus for extra-literary reflection. And in some cases, it is even fiercely critical, such as in an article published on the website of the journal *Science*, reporting on the play *AI: Když robot píše hru* [AI: When a Robot Writes a Play], which questions the very notion of "artificial intelligence", or rather its use in connection with writing the play. According to the quoted expert, contemporary text generation technology is not yet nearly good enough to deserve such an attribution: "Because the computer didn't come up with the whole script itself, DeChant says he wouldn't call the play 'AI created'" (Moutinho 2021).

39 See, for example, the answer to the question put to the script editor of *AI: Když robot píše hru,* David Košťák: "So far it does not seem so, but in the future it could maybe function as one of the tools available to authors" (TZ 2021).

The latter strategy, based on a reflection of the reading process itself, is much more sensitive to the literariness of the texts under consideration, although it also acknowledges the technological context of their production. In the case of the play *AI: Když robot píše hru*, or rather the production, several of the published responses (especially in the foreign press) had the nature of a classic theatre review, and the only technological question that their authors asked was the basic one: whether a robot can, in fact, write a play. The answers were negative. Jana Machalická's theatre review in the Czech broadsheet *Lidové noviny* (2021) is also based on this reception strategy, focusing primarily on the artistic, not technological, aspect of the generative work. The reviewer finds an "existential urgency" in the play and takes it as a stimulus for metatheatrical reflection on the development of "postdramatic theatre" (see Machalická 2021). Here too, then, the reception tends to a more general reflection, but does not escape from the world of art. The reviewer clearly approaches the communication set-up and perceives the technical imperfections of the generated text as manifestations of the Theatre of the Absurd or as a specific form of humour.

This literarily and artistically sensitive reception strategy is, however, mainly connected to the principle of the aforementioned communication game. Some reviewers even explicitly mention the notion of a game in their texts. For example, as Jan Škrob states in his review of the *Výsledky vzniku* [Outcomes of Origin] collection: "Where the robot poet Liza Gennart, for example, encounters certain limits – in the occasional repetition or cycling of words and phrases, or perhaps in the alternation of first-person grammatical gender even within a single poem – this could be read as authorial intent and a distinctive authorial style. Personally, I am in also favour of this interpretation in Liza Gennart's work, though of course somewhat within the framework of a game. (…) When reading, one misses to some extent the feeling that usually strikes one when reading good poetry, that one is somehow encountering the inner world of another person, even if distant in space and time. Personally, I believe that this is what

gives poetry a significant part of its power, apart from the quality and themes of the texts themselves. In Liza Gennart's poetry, this is inherently lacking, unless one accepts her game. The whole project is necessarily a game" (Škrob 2020).

Ivana Hostová, in her review of the same book, speaks of a "paranoid game": "To read Liza Gennart's speech is to appear in a paranoid game in which we ask ourselves to what extent reading any text is merely a projection of our own expectations of a sensory constant, and to what extent the text really is, operates, has contours, and inserts into us contents that were unknown, unknowable to us before we came into contact with it" (Hostová 2021). The playful aspect of reading is likewise evident in a review by Daniel Hevier of the same book, although this critic does not explicitly mention the game concept. Hevier considers that this type of poetry cannot be read "neutrally", that is, in the same way as any other: "And even if we consciously try to do so, there will always be, in the background of what we (re)read, a murmur of suspicion or knowledge that something is not right" (2020). Hevier testifies that he, as a reader, had to "make some effort" to manage or model his reading in some way. In his judgement, this is the result of the otherness of the generated texts, which are essentially subversive, because they disrupt "order", that is, our conventional idea of what lyric poetry should look like. In her article "Niekoľko poznámok k recepcii poézie umelých neurónových sietí" [Some remarks on the reception of poetry by artificial neural networks], Ľubica Schmarcová writes about the placebo effect, which is actually a metaphorical expression of the aforementioned principle of playfulness: "we hold a poetry book in our hands, we assume that it is poetry, and the imagination interprets the meaning from what we read, constructs a poem. This can be seen as a metaphor for the homeopathic principle – the active substance we think of, which we believe to be the instrument of cure, is not found in the remedy given, yet it works, as contemporary neuroscience clearly confirms" (Schmarcová 2020: 654). The playful principle of this reception strategy accepts the insufficiency or imperfection of the generated text. In

such a situation, the reader tends to make sense of this deficiency as an intentional aspect of the work or as a specific quality.

In many receptive metatexts of neural network literature, these two reading strategies are combined. They are, however, rarely found in a balanced state. One such example is Martin Makar's review of *Výsledky vzniku* (2021). Here the reviewer struggles with the in-between state of attempting to read Liza's verse as ordinary, existentially based poetry, and the tendency to measure her statements against the reality of machine origin – as if he were in a polemic with his own reading. He reflects on his reading with amazement at the machine's skill, and tries to suppress the knowledge of these metatextually based layers (see Makara 2021). Part of this reading strategy, then, involves a certain awareness of the stratified nature of reading, that is, the fact that reading has different layers, none of which can be completely suppressed or eliminated, although the dominance of attention can be shifted to give priority to a selected layer while not losing sight of the others. Reading thus appears here as a stratification process.

Another example of metareading informed by the history, contexts and practices of generative literature, philosophy and posthuman critical discourse, is the study by Polish literary scholar Mariusz Pisarski "Breakfast with Confucius, Dinner with Lem: Linguistic Avatars of GPT-3", in which he addressed the abilities of neural networks to create credible human representations in a literary text. These anthropomorphic aspects of GPT-3 are viewed within transfers of identity and result in neural mimetic representation for essential concepts such as identity, agency and immortality. Pisarski analysed the chatbot Virtual Confucius, Liza Gennart and the GPT-3 rendition of the poetic machine Electronic Bard in Stanisław Lem's novel *The Cyberiad* (1972). Pisarski states: "Gennart is a linguistic avatar of dispersed identity whose source can be seen broadly as the Slovak national language or even a nation at large" (2021: 70), thus emphasizing that, because Liza does not stand for anyone specific, she can be perceived as an "avatar of its own conceptual space", which creates "novel elements" (2021: 70) from the trained dataset.

The study "Syntetická poézia v kontexte slovenského nekonvenčného písania a postliterárnej situácie" [Synthetic poetry in the context of unconventional Slovak writing and the postliterary situation] by the trio of scholars Jaroslav Šrank, Ivana Hostová and Róbert Novotný, also addresses literary history (within Slovak generated and experimental works) and literary theory (regarding posthuman and postliterary trends), with an entirely different focus, emphasizing both the technological layer and the technological-historical premise of reading poetry by Liza Gennart. "In the study, we combined the method of interpretation and poetologically focused reading with a description of specific literary-historical contexts and a critical analysis of the poetry collection *Výsledky vzniku* in relation to movement in the other sphere in which it is embedded (the technological field and computer processing of the neural network's natural language)" (Šrank – Hostová – Novotný 2022: 495). This study documents how the interconnection of various aspects necessary to grasp neural poetry are able to function well at metatextual level.

THE TYPOLOGY OF READINGS OF NEURAL NETWORK LITERATURE

This discovery now shifts us to a certain schematization or typologization of reading associated with the reception of literature generated using artificial neural networks. From the above analytical probes, we can abstract two general types of reading applied to generated literature of this kind.

1. Reading of artificiality

Here, the reader focuses only on the technical aspect of the generative process, and does not perceive the generated texts as literary texts, but only judges the success or failure of the deployed technology. She does not engage in a game of intratextual subjects, but on the contrary, perceives the texts in a desubjectivized way as mere

technical products that can bear witness to humanity and human culture at most as a specific form of statistics.

2. Literary metareading

This type of reading represents a much more complex and intricate receptive activity (which is why there are disproportionately fewer reports on it than on the reading of artificiality). Its definition will thus be structured into several points that describe different aspects of the literary metareading of generative texts: stratification, intentionality, mimicry, metahability.

- **stratification**: we have already mentioned the tendency towards a stratified reading of generated texts. Basically, the idea is that the reading of a computer-generated text cannot simply be one-layered because its qualities are close to those of humanly produced texts (owing to the advanced state of artificial neural networks). Thus it is comparable to a normal human literary utterance. Seeing that the reception of a text is intrinsically and ineliminably tied to an understanding of how it was produced, this reception also encompasses the reader's consciousness and concentration, which oscillate between several levels of the text. Specifically, these levels are: technological (which includes the acts leading to the creation of the text) and literary (which includes the poetic qualities of the text and its semantics).
- **intentionality**: more than elsewhere, generative texts depend on the reader's intentionality, which moves in the stratified space of the multilayered text (or textual formation, taking into account the influence of paratexts) and sometimes accentuates the sphere of genesis (technology), other times the literary sphere (poetics, semantics).
- **mimicry**: we use the term mimicry, in the meaning of simulation, pretence, or the feigning of another personality, as was proposed by the game theorist Roger Caillois in his book *Man, Play and Games*: "The spectator must lend himself to the illusion without first challenging the decor, mask, or artifice which for a given time

he is asked to believe in as more real than reality itself" (1961: 23).[40] The reader chooses between the layers of the text based on her intention, but this does not mean that she completely suppresses the unchosen alternatives. On the contrary, she is aware of them and their technological context, she knows about the inanimate and non-empirical background of the generated text, yet (thanks to the linguistic and stylistic qualities of the text) can agree to play along with the mimicry. This allows her to perceive the generated text in the same mode as a text created by a living author. However, awareness of the playful nature of such a reception never disappears. The acceptance of mimicry within the reception of generated texts is clearly visible when seen through the lens of intratextual subjects. In this respect, the generated texts (primarily lyric poetry) do not differ fundamentally from ordinary texts: we can identify the lyrical subject (the speaker of the poem) and reconstruct the subject of the work (the image of the fictional originator of the text).[41] This is where information about the real origin of the generated work comes into play. The reader finds herself at a crossroads: she can accept the mimicry and pretend that the fictional identity of the program (e.g. Liza Gennart) is the actual originator of the texts, while still knowing that the real originator has a completely different character. She can therefore agree to the offered mode of reading, but, however, cannot ignore its play-like nature. In an ordinary work, there is a quite natural confusion between the subject of the work and the psycho-physical authorial subject; the play becomes indistinct, or recedes from the reader's consideration. In the case of a generated work, the playful nature of the reading does not recede from view; it is always present and participates in the creation of meaning. That is why we speak here of metareading. A generated statement cannot be seen as a human

40 Caillois uses the term mimicry also in reference to the reader's identification with a novel character (1961: 22). Translated from the French by Meyer Barash.

41 The terms "lyrical subject" and "subject of the work" are used here in the way proposed by Miroslav Červenka (2003).

statement, but can be read as a full-fledged mimicry. The dimension of real authenticity is absent here, but the dimension of a play on authenticity is not necessarily absent – which is, after all, the modus operandi of many non-generated texts (for which we usually cannot verify the fidelity of authenticity, but only assume it).

– **metahability**: within the framework of play-based reception, it is possible to perceive the shortcomings and imperfections resulting from the automatic generation of the text as manifestations of artistic intentionality, even as manifestations (in Zdeněk Mathauser's words) of the highest level of artistic skill, or metahability. Metahability can be seen as the art of inability, that is, when the creative subject no longer strives for absolute virtuosity, but abandons the quest for perfection in the interest of authentic expression, letting the work speak through its cracks and imperfections. Mathauser writes: "Metahability is a condition that transforms virtuosity from a state of finished, closed perfection into perfection *in statu nascendi*: the world now emerges in a state of birth!" (Mathauser 1994: 21) And this is exactly true for generated texts and their literary metareading. There are a number of mistakes in these texts that point to the process of birth/generation. In literary metareading, these imperfections can be made to carry an aesthetic function; in technical reading, on the contrary, such faults can completely annihilate the text in terms of meaning and literary quality. Thus, even a machine error can have a human dimension, even a humanizing one, if it is read as such – within the playful situation of literary metareading. If the generated texts of the future are indeed technically and linguistically perfect, they will be at risk of artistic failure, as the reception game will lack opportunities for identifying elements of metahability.

Mathauser's notion of metahability, or rather his whole triad of notions affecting levels and forms of artistic skill, that is, hability – superhability – metahability, brings us to another level in the reception of neural network literature, namely the reception aimed at how they

function within the system of contemporary literature. Regardless of whether these generative projects are associated with the pursuit of a perfect imitation of human literary expression, or whether they deliberately work with the imperfections generated by the generative process, the result always acts as a subversive agent within the literary system. Projects that strive to achieve a linguistic and stylistic quality comparable to human literary results (hability), or even pursue a vision of future outcomes that surpass the normal level of such results (superhability) – as exemplified in this chapter by *Digitální spisovatel* [Digital Writer] – act as a challenge to contemporary literature as a whole. If a machine-produced text easily achieves the average literary quality of commonly published texts, or even aspires to master challenging genre forms at a virtuoso level, its presence undermines these spheres of mediocrity or formal perfectionism and at the same time acts as an appeal to the otherness of human literary production that authors should achieve in the context of machine-produced texts.

No less subversive is the effect of the results of projects that, on the contrary, deliberately and systematically work with the imperfections created during the generation of the text (here, in particular, *Umelá neinteligencia* [Artificial Unintelligence] and *Výsledky vzniku*). Samuel Szabó exploited this subversive potential to the maximum in his project, showing how the infiltration of imperfectly generated text into ordinary literary and non-literary textual practice can be artistically effective. This form of subversion is essentially parodic in nature and subverts established notions of literary norms in a neo-Dadaist manner. The fluctuation of gender in Liza Gennart's texts has a similar effect, with its gender-subversive significance further reinforced by its human authors, who label Liza a feminist in the blurb of the book.

12

The consequences of generative praxis for the theory of creativity

Stormy developments in the field of AI and the use thereof in literature have been going on for only a few years; nevertheless, we are now already in a position to be able to ask what the results are or could be for the praxis of literary creation and literary criticism, and indeed for literary theory and the theory of creativity in general.

The fact that a literary text can be generated by AI, and that the linguistic characteristics of that text make it indistinguishable from texts written by human beings, has significant consequences for literary theory. This particularly addresses the issues of authorship and creativity of literature (which are crucial when seeking the identity of literature as such or of literature as a communicative system). Now we will turn our attention to the first of these areas, the theory of authorship.

FRAMING AUTHORSHIP

The question of authorship has been organically connected with generative literature since its inception. For example, this fact led Hannes Bajohr to develop a four-stage hierarchy of types of authorship, which tracks the gradual decrease in human involvement in the creative process: from primary authorship based on the act of

writing, which remains within the competence of the human author, to quarterly authorship, where text-creating activity is within the competence of large language models and in practice, humans only retain the possibility of influencing the training dataset, although often not even that, as human input often is limited to providing a textual prompt (see Bajohr 2024: 272). Philippe Bootz and Christopher Funkhouser, in their chapter devoted to computer-generated texts in the compendium *The Johns Hopkins Guide to Digital Media*, state that automatically or combinatorically generated texts raise a number of important questions in relation to the authorship of a literary text: "who is the author: the human programmer, the person who selects the input or the machine applying the program?" (2014: 84)

These are certainly fundamental questions; however, in our view, the way they are asked may be different again in relation to synthetic creation. Instead of enquiring who, here, is the author, we could also ask what role is played by the individual actants, both human and technological, in the genesis process. There is, we think, no need to explain what could be meant by human actants. In the literary context, we can understand non-human actants as, for example, writing tools, the material written, and similar. Choosing the role to be assigned to the micro-aspects in the creative process is, then, also a part of authorial strategy.

The work of Bruno Latour may be a methodological inspiration here; he analyses the interaction of human and non-human actants and the network of their relationships. The praxis of generative literature provides good evidence of Latour's premise that society (and indeed the text) are never limited to merely human actants; there are collectives of human and non-human actants in both cases (1991: 110). In Latour's concept, both human and non-human actants are involved in chains in which one or the other sort of actants are present in different proportions. The generative literature chain is then characterized by a significant degree of creative activity delegated to non-human/technological actants. In this context, Latour speaks of a distribution of competence (2008: 158). With regard to the question

of the authorship of generative literature, we can then distinguish textual creation competence (arranging linguistic material, text composition) and communication competence (placing the text in context, making a selection from the pragmatic publication options, paratexts). Textual creation competence is, in the case of computer-generated literature, more strongly delegated to a machine than in other literary techniques, while the human retains the communication competence. During every creative act, these competences are delegated in a specific manner depending on the options or intentions of the human actant (for example, Bohumil Hrabal deliberately delegated part of his textual creation competence to his faulty Perkeo typewriter; in generative literature, textual creation competence is delegated to the human actant in the first phase of algorithm/software creation and in preparing the initial linguistic material, while the outcome phase of text creation is delegated to machine activity and also to the role of randomness that is an inherent part of this activity).

The writing, then, takes place somewhere between two extremes: on the one hand, it accentuates the spiritual, human and subjective nature of literary expression; on the other, the various forms of dehumanization and desubjectivization are implemented by shifting the creative process to the sphere of randomness or emphasizing the role of the means of writing. In the study "Česká počítačově generovaná literatura a otázka autorství literárního textu" ["Czech computer-generated literature and the question of authorship of the literary text"] (Piorecký 2017), on which this chapter is based, these extreme positions were labelled as the concepts of anthropocentrism and technocentrism. Generative literature and, with it, of course, the creation of synthetic texts using artificial neural networks, understandably fall into the zone of technocentrism.

The function of computer-generated texts in literary discourse consists, in our view, in extinguishing the aura of the author as the sole or hegemonic originator of the literary work, among other things. On the contrary, they consecrate the circle of technological

actants involved in the work's creation, whether the technology is understood, in the narrower sense of the word, as a tool used to produce a text or as a somewhat more abstract technology of genres and literary conventions or processes. This, however, is not to call into question the role played by the artistic talent (and not "genius") that fundamentally influences the quality of technologically produced works and is frequently a guarantee of artistic value (even critics of romantic authorship do not wish to sideline the role of talent, they merely call for the medium to be appropriately appreciated in the search for the text's values).

The authors of the study "The Death of the AI Author" (Craig – Kerr 2021) declare themselves against authorship as a singularity of either human or machine ability and label this simplification as "romantic". By this, they mean a mythologization of the concept of the author as a genius able to create an absolutely original work from nothing; that is, as precisely what requires to be de-romanticized: "Still, when scholars frame AI authorship by saying that 'there is no one holding the … pen,' that 'the human author [is removed] from the work,' or that 'computers are increasingly able to create works unassisted by humans,' they imply, if not entail, a romantic conception of AI authorship. (…) These portrayals of AI processes do exactly what classical portrayals of romantic authorship do: they depict the author – in this case, AI – as an ideological author that is able to transcend the messy realities and relationships, inheritances and debts, of human experience and social situation" (2021: 72). Meanwhile, they deem essential a full appreciation of the basic fact that synthetic works are not created in a vacuum, but conversely, in a network of relationships with a huge number of texts by human authors and are involved in currently ongoing interactions and creative processes (see 2021: 67). We completely identify with this stance and also consider inspirational the suggested method of de-romanticizing authorship proposed by these authors. In fact, they understand authorship as "a capacity for creative interaction" (84) and, with reference to Bakhtin's theory of dialogism and heteroglossia, they are convinced

that the "de-romanticized approach to AI-generated works lies in a dialogic theory of authorship supported by a relational understanding of the human self" (2021: 74). These authors view the dialogic aspect of authorship primarily in the principal relationship between author and reader, and also in its bonds to the broader social context (see 2021: 82).

When we look more closely, we can of course also identify dialogism in the individual (even relatively detailed) creative acts preceding the creation of a synthetic work; these acts are the prerequisites for the artistic use of neural networks. Authorship seems dialogic due to the basic principle of human-machine interaction that creates synthetic works: the human impetus and subsequent machine reaction. In the case of older networks and smaller language models that allow fine-tuning (RNN networks or GPT-2 and similar), the first dialogic act was the training situation itself, or rather, the final network training: a human being provides a machine with training data and, as the case may be, their deliberate choice models the system's future abilities; the system's response to this act is the ability to generate a text in the specified style. Another layer of dialogism (which is identical both in older systems and the most recent ChatGPT) is the very entering of prompts: a human being enters an input sentence into a machine for it to continue, or even an instruction in natural language that the machine then has to follow; the response is a generated sequence of text that the human being either accepts or amends using another prompt, and so on. Another interaction, which in the lion's share of cases precedes the publication of the generated results, is the selection and, on occasion, amendment of the synthetic texts so that, for example, a publishable collection of poetry may be compiled from them. Dialogic authorship, then, anticipates the author in the role of operator (and ultimately, also of curator), who during the entire generation process enters into various interactions with the neural network and holds a dialogue with it. Understandably, the extent of this dialogism varies in different creative projects – in cases where the neural networks are applied as assisted

creativity, the "monologism" of human creativity may, conversely, prevail. Whatever this extent may be, it is itself the authorship of a synthetic (or hybrid) work, in principle self-reflexive, due to the dynamics introduced into it by the relationships between the individual actants involved, both human and technological. And precisely this incomparably higher dialogism in the authorial creative process differentiates the form of authorship applied within CoNN from older forms of authorship of generative literature.

We can, then, understand authorship in the context of synthetic creation as a dialogic process in which human and non-human actants are involved to varying degrees – provided that the presence of both types is necessary in the given process. At the same time, however, we must be aware that the work of art as an utterance (but also as a commodity) cannot make do without the status of author, that is, of a subject that represents it in the social space and embodies its intentionality as an essential supporting point for the consequent reception processes and the interpretation of the work's meaning. This intentionality, in the case of synthetic creation, is by its very nature implemented primarily at the start and the end of the generative process and assumes the use of communicative competences (which we discussed at the beginning of this chapter) – a neural network's textual creation process cannot be associated in any way with any intentionality (although fictitious intentionality can also be correlated even in a mimicry-based reception process). The generative process, then, is framed by two acts predominantly communicatory in nature: 1. formulation (largely implicit, sometimes also represented in paratexts) of the intention that launches the generative process (e.g., the generation of new Shakespearian sonnets, parodies of Slovak nationalist poetry, the creation of a fictive feminist poet, etc.); 2. the act of publishing the generated outcomes that also attests that intentionality to the public. We can understand the act of publishing in the sense given to it by Červenka, as a "moment when the literary text of a private matter changes into the text of a literary work, that is, into a culturally social fact" (Červenka 2009b: 99). As a result of this act – as

Červenka again points out – the psycho-physical author ceases to play a role in the work's communicatory life, because the semiotic process replaced them with a semiotic construct, which Červenka labels as "personality". In the case of synthetic works, meanings arising both from the act of publishing itself (and potentially from any paratexts that may accompany it) and from the generated text, may be summarized under the concept of "personality", as no psycho-physical entity is behind the text, yet the presence of a speaking subject is evoked by it. The layering principle, then, is repeated here; we drew attention to it in the preceding chapter when defining the principle of literary metareading. Like the readership of synthetic texts, the authorship thereof also has layers indicating, on the one hand, the creative acts provided by a human being and, on the other, the generative creation arising from the neural network's activity. We described the consequences of this layered structure for the reception of these works in the previous chapter. Here, then, we will merely state that the traditional concept of personality in the case of synthetic literature frames creative activity from two origins (human and technological) and that the layered structure remains evident in the reception processes, although in the case of the technological layer, authorship can be discussed only in the context of a playful situation in literary metareading, or rather in association with the mimicry principle.

The authorship of a synthetic work, then, has two fundamental aspects in our approach, in which it differs from the authorship of works created by the conventional method – the already mentioned dialogism and then also the framework. The framework authorship imparts intentionality to the outcomes of the generative process and gives them a communicatory nature. The framework authorship guarantees that the synthetic work will have the semiotic identity described above, but we can also understand it in a somewhat less abstract sense as a concept covering the individual roles that the human actant(s) in the generative creative process take (data specialist when preparing the training corpus, the operator managing the neural network during training, the prompter entering inputs during the

generation process itself, the editor selecting the results suitable for publication, and so on). In each case, the framework authorship is one of multiple aspects in the synthetic work's structure that impede or even prevent a non-reflective, consumerist reception. The framework authorship, then, is a concept that considers both the human actants who are involved in the work and the outcomes of the neural network generation, which human actants insert into semantic, contextual and communication structures, that is human authorship over a synthetic piece of work.

Computer-generated literature can thus be called a quantitatively small area asking big questions. It is the core of literature's self-reflection and forces the answers to questions regarding identity in this type of art – as, for that matter, S. J. Schmidt has already indicated in his essay *Strojová poezie* ([Machine Poetry], in Czech, 1969), and as authors point out in their latest research on the subject (for example, Stephanie Catani understands generative art primarily as an "innovative and critical space of reflection," which encourages a redefinition of the very concept of creativity; see Catani 2024: 304). It is well known that serious questions of a legal nature are involved in connection with the authorship of synthetically generated artefacts. Here, however, we will limit ourselves to merely stating that, when the manuscript of this book was completed, artificial intelligence had not yet been granted the status of an author whose rights would be protected by law, and that debates on this matter were in full swing as, indeed, they were on related matters, such as the issue of protecting the rights of authors whose texts had become part of training data sets. We will therefore leave this field to the specialists in such complex legal matters and will continue to address artistic-scientific issues, such as the nature of so-called computer creativity and its relationship to human creativity.

HUMAN AND COMPUTER CREATIVITY

The influential Slovak literary critic Peter Zajac, for example, has addressed the issue of creativity in the literary context. It was his main focus in the late 1980s and early 1990s and what is known as pulsation theory, which arose from the basis of these deliberations, is still productive today (see, for example, the recent outputs of Dalibor Tureček's project on the discursivity of 19th century literature, which relies on precisely this concept). Here we take Zajac's conception as an example of a systemic model of literature, which – given the period in which it appeared – could not yet be built with regard to the creative potential of digital technology. This may rather form a notional contrasting surface, on which the systemic consequences of the presence of neural networks in literature will be clearly evident.[42]

The basis of Zajac's approach to literary creativity is an attempt to transfer the functioning principles of live systems from the natural sciences to literature. However, the main premise here is that literature as a system can be creative only when it is drawing energy from its surroundings, which is allegedly possible only via the author as the bearer of life praxis, who will transform it into literature using literary works (see Zajac 1993: 122): "Only human life, survival and experience, that which humanity contains in cognitive activity and active knowledge, can be a source of literature" (1990: 21).

Zajac views literature as a system surrounded by other systems. Indeed, he admits that it is a self-organizing system, but at the same time assumes its absolute independence from the "systemic surroundings", which are the only thing that can provide it with "energy as a source of its own dynamics (and creativity)". The self-organizing

42 It is difficult to determine to what extent Zajac's thinking on the sources of literary creativity has changed in recent years. A certain shift is signalled by Zajac's "Prolegomena k poetike slovenskej literatúry po roku 1945" ["Prolegomena on the poetics of post-1945 Slovak literature"]; the first point reads as follows: "The new poetics constitutively follow the rules, grammar and algorithms creating literary texts and events." (Zajac 2017: 173). It is, however, impossible to judge from this isolated statement whether the author has admitted the principle of algorithmization into his systemic model of literature.

ability of the literary system then consists purely in the fact that it absorbs the energy received "in its existential form of 'expression', 'presentation', 'image' of the living world" (Zajac 1990: 20). He views human life, sentiment and experience as essential to the existence of literature.

Zajac understands creativity as a rationally intangible quality, whose constituent features are randomness and unpredictability: "We are not yet familiar with algorithms of creativity and, to tell the truth, I do not believe that they exist: they would lose the moment of unpredictability that is the fundamental feature of real creativity, the moment of 'productive chance', 'fluctuation', 'mutation', 'energy of error' that, together with the 'legitimacy of creativity', 'parametric arrangement', 'selection', 'energy of discovery', principally characterizes creativity." (1990: 10)

Zajac views literature existentially as a transmission of human experience with the living world. That is why the author takes so strong a position in his conception. He views the author as a singularity who has no alternative in the process of creating and who fully defines the creative process. Zajac understands the author as the work's originator, as the "sole medium of creativity". It is possible only to partially agree with this notion (also in light of literature generated using neural networks). In the majority of cases, the author is indeed the medium of creativity, but the systemic conditions of the given linguistic material and literary norms and conventions intervene in their creative acts – and these non-human actants play a productive role in the process of creating.

Zajac correctly identifies the literary system's internal dynamics (literature's repeatedly emphasized need to move in "pulsating" or "shaky" situations", see Zajac 1990: 23). However, he sees the origin of these dynamics, somewhat one-sidedly, in human actants only. His conception of creativity is, in fact, a manifestation of or homage to the human ability to act creatively, or rather, the human ability to transmit life experience from one individual to another. The specificity of this literary transmission is not sufficiently appreciated here,

however, nor is, primarily, the creative potential of the vehicle itself – language. Experience can be transmitted by various means, of which literature is merely one, and its specificity lies precisely in its linguistically self-reflexive nature. For Zajac, creativity is an existential and subsequently a social phenomenon, and no longer a linguistic, compositional or technical phenomenon. The results of multiple literary experiments conducted in the context of CoNN prove that the foundation of creativity is rather linguistic combinatorics.[43] And the layer of originality, unexpectedness, novelty to which human talent is predisposed is built just above it, and even talent is of course not all; randomness or serendipity may likewise produce new and valuable literary achievements.

Another segment of Zajac's conception, which in the transformative context of literary creativity appears hard to sustain, is the reduction of literature to its elite layer. Zajac considers only those works representing a "qualitative contribution to the system" as the results of creativity. He resolutely defines "systemic" literary works in accordance with the criterion of novelty: "A literary work must not be 'completely new or different', because in such cases literature would be unable to absorb it, but also not 'completely old', because it would be unnecessary to literature from the perspective of merit" (Zajac 1993: 122). Zajac clearly views the literary system as a specific ecosystem with a tendency to eliminate marginal manifestations, or rather manifestations weakened by their systemic position. Maybe this, too, is the consequence of adopting the systemic model from natural sciences. Even literary works dependent on tradition and works that contribute little to developing tradition are part of the literary system – they are systemically (in terms of communication and intertexts) connected to elite manifestations of literary creativity,

43 Machine-generated texts amplify what could already be discerned from the texts of literary post-modernists: for example, many of Ivan Wernisch's poems do not, by their very subject matter, allow the assumption that they are based on life experience, but on the contrary, on experience with texts and on the ability to generate a new text from the set of texts that have been read.

although they do not achieve their innovative qualities. They make up the substance of literature from which arise isolated cases of works that can transcend and shift tradition or standards. This is again evidenced by the experimental praxis of generative literature constructed on the interaction of a textual corpus and a neural network.

In this regard (and not only this regard), Schmidt's model of a literary system, for example, becomes much more plastic. When modelling the concept of a "literary system", Siegfried Schmidt works with the idea of the boundaries of a literary system created by socially binding conventions (see Schmidt 2008: 47). In connection with this topological metaphor, we can reflect on the inner structure of the system from the centre (the elite segment, the acts with the greatest degree of literary competence, the system is dynamically enriched here), to the middle zone (qualitatively average production, the system conventions are however maintained here, adopted from the central segment) to the peripheral zone (substandard production, literary competence cannot be taken for granted, conventions are (unintentionally) weakened). The literary system, then, is not only an ecosystem in which strong and weak entities compete, but an internally connected and stratified communication system, within which creative activities produce texts embodying various degrees of literary competence that mutually complement each other and create complementary value zones.

In Zajac's essay "Tvorivosť a tradícia" ["Creativity and tradition"], however, we also find moments that fit much better with the principles of creativity as revealed by CoNN. Zajac understands tradition primarily as a space for "learning creativity" (1993: 123), or even "learning the system" (1993: 124) He does not view creativity and tradition as antithetical aspects of the literary system, but conversely, as complementary. Within CoNN, the training corpus is a *de facto* incarnation of tradition used for learning and from which material for a new text is drawn. The content of this corpus (just like the method for viewing tradition) is a question of authorial choice. The general principle of the relationship between tradition and creativity here

is, then, the same; merely Zajac, in the early 1990s, had not foreseen that this learning of creativity would be an algorithmizable process in a few years' time. Face to face with the culture of neural networks, then, Zajac's theory of creativity has only partially lost validity, but it definitely creates a need to regroup emphases: the strong role of surrounding systems and the author's life experience as a necessary prerequisite for creativity is unsustainable, because neural networks experimentally prove that a literary text can be created entirely without inputs in the form of authorial empiricism; by contrast, a sufficiently strong systemic role must be attributed to tradition as a reservoir of all texts deemed literary and to language as the space for creative combinatorics.

When seeking more appropriate theoretical frameworks for the phenomenon of literary creativity, it will be necessary to find support in newer concepts of creativity that already take current technological contexts into consideration. In particular, we mean the conception of creativity raised by Margaret A. Boden in her book *The Creative Mind* (2004).

Boden defines creativity as the ability to come up with ideas or artefacts that are new, unexpected and valuable. She views it as an aspect of human intelligence enshrined in general abilities such as conceptual thinking, perception, memory and self-reflection. At the same time, she does not assign creativity merely to a narrow intellectual elite (which Zajac's concept *de facto* implies), but considers every human being to be creative – although to differing degrees (see Boden 2004: 1).

Boden's differentiation between psychological and historical creativity is very inspiring, even for a value-based approach to creativity. By psychological creativity, she means thoughts or pieces of work that are new and valuable to any human being who comes up with them, i.e., to their originator. The fact that quite possibly many other people have already come up with the same idea plays no role here. Historical creativity, conversely, includes such thoughts and pieces of work that nobody had yet come up with and thus appear for the

first time in human history (see Boden 2004: 2). In both these general types she consequently sees the basic form of creativity in creating an unknown combination from known elements. The machine generation of texts, then, also fits neatly into this combinatoric conception of creativity.[44]

However, for Boden, the structured approach to creativity goes still further. This is evident in the differentiation between exploratory creativity and transformative creativity (see 2004: 4). Exploratory creativity, in the author's conception, is based on an exploration of the existing conceptual space and on re-evaluating existing thought and creative processes in order to create something new and valuable, which will of course fall under existing thought structures. Transformative creativity is, by contrast, characterized by the attempt to change existing thought structures, or to restructure or redirect their intentions, e.g., to transform one artistic genre into another or replace one scientific paradigm with an alternative. Based on this concept, then, it is evidently possible to investigate the outcomes of so-called computer creativity, that is, projects generating literary texts using neural networks, at least at the level of psychological and exploratory creativity. After all, Boden does so herself, and sees the meaning of this practice in the opportunity – against the backdrop of investigating computer creativity – to ponder creative abilities and human approaches in a new and better way (see 2004: 10).

With her conception, Boden stands in clear opposition to what she calls the "inspirational" or even "romantic" concept of creativity, which sees in creativity an example of human greatness, is irreducible and cannot be scientifically explained – its beauty is supposed to lie

44 Marcus du Sautoy, in his book *The Creativity Code* (2019) likewise references Boden's proposed differentiation of creativity types. Jolana Poláková similarly differentiates forms of creativity in her book *Myšlenkové tvoření* [Thought Creation], where she distinguishes between "functional creation" (in which the new appears as a function of the old, the human being in it innovates depending on a given, completed form) and "developmental creation", which is a *de facto* analogy for the concept of historical creativity (in which existing forms change to accommodate a hitherto mentally unmastered content). (see Poláková 1997)

in its inexplicability. Boden adds that these approaches, of course, are nothing to do with the theory of creativity, but rather concern its mythology (see 2004: 14). She finds the origin of these ideas in Plato, particularly in his opinion that the poet is holy and can only create thanks to inspiration that lies beyond him, as it is divine in origin. For that matter, we have also seen this need for external input into the creation process in Zajac's conception, in which the tendency to mythologize human creative abilities is likewise obvious, although rather in the existential, not romantic, sense of the word.

The emphasis on the value perspective when defining creativity, however, brings Boden closer to Zajac. Boden, though, does not only oppose those who connect creativity with magical inspiration, but also those who attempt to replace this magical concept of creativity with a combinatorial conception of creativity as creating new combinations from existing elements. Boden is of the opinion that a merely unusual creation cannot be called creative if this creation is not also valuable and useful in its unusualness (see 2004: 41). Surprisingly, she does not really address the relativity of this value and usefulness, not even in relation to the basic creativity zones she herself defined: otherwise, the creation of value takes place in the zone of psychological creativity or within historical creativity. Moreover, the value of dead ends remains completely overlooked here; dead ends in science and art help the practitioners to master new conceptual spaces. Here, too, we believe that a value stratification has a separate position and that it is not possible to insert it into a model of creativity itself.

Much more precisely, Boden opposes theories considering the creation of new thoughts and creative procedures *ex nihilo* as the main principle of creativity. Rather, she responds with a question: if the human mind produces its thoughts only from its own strength and resources, how is it possible that any given thought did not arise earlier, that thoughts arise in certain time sequences? She does admit, however, that chance can also contribute to creativity. This is very important for appraising computer creativity, because its best results are random in nature.

To the opponents who deem unpredictability the essence of creativity, Boden responds by referencing the infinite monkey theorem (among others). This is a mathematical theory ascribed to Emile Borel who is said to have first made this metaphorical statement in 1913: if we sit a monkey at a typewriter and let it hit keys at random for an indefinite period, one day the resulting text will comprise the complete works of Shakespeare. The probability of this actually happening is extremely low, but from the mathematical perspective, not zero. Several unsuccessful attempts to prove the accuracy of this theorem have been made in practical experiments with live monkeys. The accuracy of this theorem in probability, which also has consequences for literary theory, was of course proved in 2011 by programmer Jasse Anderson, who used software to simulate the situation of the infinite monkey theorem and actually succeeded in finding 100% matches with all text sequences of Shakespeare's works in randomly generated character sequences (Anderson 2011).

For that matter, in her book *The Creative Mind*, Boden comments on the question of computer creativity itself and defends it by arguing that, in the era of artificial neural networks, it is no longer possible to object that computers merely mechanically follow commands in line with a program created by a human being: "People who claim that computational ideas are irrelevant to creativity *because brains are not programmed* must face the fact that connectionist computation is not the manipulation of formal symbols by programmed rules. It is a self-organizing process of equilibration, governed by differential equations (which deal with statistical probabilities) and comparable to energy-exchange in physics." (Boden 2004: 137)

Boden does not view neural networks used in the field of art as competition for artists, but as an opportunity to better understand the processes leading to the creation of artworks. She correctly comments that what is generally labelled computer music / graphics / literature is usually the result of the interplay of technology and human contributions. According to Boden, the limit to the computer generation of artworks is the absence of searching for new forms – programs

of this type behave like artists who have found their style and stick to it (see 2004: 164).

Boden labels the reasons for the difficulty in programming for literary creation as follows: 1. The complex, complicated nature of motivations leading to the creation of a literary work; 2. The need for general knowledge and experience; and 3. The complexity of natural language. It is undoubtedly true that a computer program knows almost nothing about the structure of motivations that prompt a human being to create a literary text. But we still cannot say that a writer has generally valid knowledge of the structure of human motivations; on the contrary, they merely apply the selected situation and motives.

Boden is much more precise in her observation that minimalist texts, in terms of both extent and formality, are the most suitable for generation using neural networks, because in such a case the reader must do a much greater share of interpretative work than for more stylistically complex texts. And the result of this may be that cracks in the meaning left by the generating software are healed on reception (as an example, Boden cites a computer-generated haiku, the outcome of which was good as early as the 1970s).

Boden's book convincingly overturns the romantic theory of creativity that situates historical creativity beyond the limits of ordinary humanity and claims that such an ability to create is held only by people who are fundamentally different from others. By contrast, Boden proves that what was done by creative geniuses in the past can typologically be done by anyone. Of course, famous creators did it better, they had better mental capacity and a more in-depth understanding of the rules of the given artistic forms, and were able to develop and transcend them. A work of genius is created with a more effective use of the mechanisms inherent in everyone, with a supernatural gift (see Boden 2004: 275).

In her most recent book, *AI. Its nature and future* (2016), Boden elaborates her original theory of creativity and examines the extent to which it is compatible with current outcomes in the development

of AI. She concludes that all the types of creativity that she defined in her older work also appear in the field of creativity using neural networks. She states, entirely without doubt, that AI can function on the principle of combinatorial creativity, and even that these works of art can be surprising and novel (see Boden 2016: 69). Boden similarly overturns the conjecture that a neural network is incapable of transformative creativity, citing as an example the musical compositions generated using AI in the style of Chopin or Bach.

Boden "merely" places a question mark over the relevance and value of artworks generated using neural networks. The very process of creation is made possible by neural networks. The problem occurs only at the moment when the outcome of this process enters into communication with the addressee or the audience. AI is not conscious. In the field of communication it is therefore blind and helpless, and it can achieve value or effect only with a significant contribution from luck, or a human being.

Here let us summarize the main consequences of the presence of texts generated using neural networks for the theoretical and systemic consideration of literature. First and foremost, there is knowledge of the situatedness of the literary system among other systems: the literary system is not primarily dependent on its surroundings and it is able to reproduce itself from materials inherent to it (language, text). Furthermore, neural-network-generated literary projects indicate the need for a differentiated and stratified view of the creative process model: at the very least, it is necessary to differentiate between the *text-creating layer* (which is overwhelmingly combinatorial in nature and can be replaced by a machine) and the *communicatory layer*, which can only with difficulty circumvent human contributions and presupposes an up-to-date evaluation of contextual information and the pragmatic application thereof.[45] CoNN likewise relativizes

45 Martin Švanda has proposed a complementary model of phasing the creative process from the perspective of psychological creation: 1. The inspiration phase (which omits the free activity of poets; the creative act comes unexpectedly, without a current link to time or environment); 2. The elaboration phase

the author's[46] dominant systemic position as the hegemonic originator of the literary work and, by contrast, indicates the fact that the author is always only one of a number of human and non-human actants involved in the creative process. Last but not least, synthetic creation helps to demystify creativity as an ability earmarked for the creative elite and, indeed, also demystifies the literary system as a set of elite literary acts – in this light, literature is seen to be a highly complex system with value stratification.

Nevertheless, neither of the theories analysed above sufficiently resolves the value aspect of creativity. Zajac takes into account only the elite acts with the ability to develop the literary system. But even Boden implies that the conception of creativity is a field of elite, original and valuable acts. The reality of literary culture is, of course, different; creative activity gives rise to works of varying quality and varying degrees of originality. A satisfactory concept of creativity should be able to take this stratification into account. In all segments of the literary system, literary works are created via creative activity and in the majority of cases, combinatorics outweigh originality. Each text – with the exception of plagiarized texts – is the result of creative activity. Non-original creative acts have no value in the historical creativity zone, but may, conversely, have significant value as aspects of psychological creativity. However, not even this progressionist view of creativity is exhaustive. The value of creativity may lie in the mere relaxation or possibly socialization function of creative activities (see the extensive online community of amateur creators). Here, of course, we are moving from the field of literary theory to the impact that creation using neural networks has on the sphere of literary creation and literary criticism, or the field of a value approach to literature.

(dominated by the rational act of elaborating the initial idea; stylistic rules enter the game) (see Švanda 2010: 122)

46 Here there is experimental confirmation of older poststructural theses on the death of the author (Barthes) or the conception of the author as a function of discourse (Foucault).

THE AUTHORIAL CONCEPT OF CREATIVITY AND THE VALUE PERSPECTIVE

Since its ancient beginnings, the history of literature has been permeated by a recurring dispute between authors themselves about whether a literary work is the result of a human being's creative skill, or whether its origin is transcendental and the human being is merely the intermediary recording it. We can follow the oscillation between the two positions across cultures and historical eras: 1. The transcendental position, based on the mythologization of literary creation and of poets as exceptionally spiritual entities who cannot be influenced by human will or learning; the poet here is rather a medium for divine inspiration; 2. The rationalist position, characterized by emphasis on the technical side of literary creation, which can be mastered by learning; here the poet is the work's active creator and producer.[47]

Understandably, CoNN enters this traditional literary dispute on the side of the rationalists, not the transcendentalists. When a training corpus is properly assembled, it is possible to use a neural network to generate texts in practically any style and with practically any semantic focus, that is, certainly also texts that, for example, are perceived as spiritually inspired due to their symbolism or rhetoric and *de facto* merely written by a human being. Synthetic creation definitively shows that metaphysical meanings in poetry may arise only in the process of the text's reception, and not merely of its genesis, and that all other (pseudo-romantic) conceptions of creativity are rather mythological in nature. The basic function of CoNN in the contemporary literary context is, then, to demystify these authorial communication strategies. And synthetic texts can effectively fulfil this function as experimental praxis with a marginal share of overall

47 In diachronic contexts and intercultural relations, this topic is discussed in detail by the authors of the collective monograph *Původ poezie* [The Origin of Poetry] (Fischerová – Starý 2006).

literary production. Extending or even replacing human literary creativity with computer creativity, which sometimes raises concern in parts of the literary public, does not even come into question. Any wider deployment thereof (excepting areas of commercial, genre literature) would be pointless. However, CoNN may influence literary creation in the field of acquiring literary competence, particularly in the form of assisted creativity.

Computer creativity theorists (e.g., Lopez 2016) judge that neural networks cause a particular acceleration in the literature democratization process. At times they even indulge in imagining a world in which anyone (with the help of these tools, that is, in the spirit of so-called assisted creativity) could create at the level of the best writers, painters or composers of the past.[48] And they describe this possibility as most encouraging for the individual who does not have any creative abilities (but will acquire them by collaborating with neural networks). However, the question remains: what are the potential benefits of achieving this goal? In addition, something essential is absent from this plan for a revolution to democratize art – the communication component. An objection to these theoretical visions can be raised: that it is not enough for an untalented individual to create a poem or short story of equal linguistic perfection using a neural network in order for them to reach the level of a top writer. The meaning and the value of a work of art are procedural in character and occur within the context of the reception process. A part of the work, then, is the staging of reception processes that will deliver this perfect text in an effective manner to a suitable audience at the right time in the right place. And here we, too, see a fundamental shift: CoNN may,

48 "A basic idea is that creativity is a social process that can be augmented through technology. By projecting these ideas into the future, we could imagine a world where creativity is highly accessible and (almost) anyone can write at the level of the best writers, paint like the great masters, compose high-quality music, and even discover new forms of creative expression. For a person who does not have a particular creative skill, gaining a new capability through assisted creation systems is highly empowering." (Lopez 2016: 118)

paradoxically, contribute to reinforcing the communicatory aspect of literature, precisely because it cannot be replaced by machines (for now). Writing a perfect text is not sufficient. This is the main message of artificial intelligence to literature and those who create it.

We agree with Ramon Lopez: thanks to neural networks, creativity can no longer be viewed as a mysterious gift. We find ourselves in a situation in which such pseudo-romantic ideas about the unity of spirit, body and work can be considered experimentally excluded. The presence of neural networks in literary discourse cannot, however, be viewed solely as an invitation to cleanse this conception of literary creativity, but also to structure it, or even stratify it, in a more delicate fashion. We now know almost certainly that a literary text can be created exclusively using linguistic combinatorics, that is, with no communicatory intention (e.g., to share a certain life experience) and with no artistic ambition (e.g., to push the aesthetics of a particular genre in a new direction). It is not necessary, or even possible, to exclude literary texts created in this elementary way from participating in the literary system or to deny their origin in literary creativity. However, it is not solely machine-generated texts that are created in this way, but similarly a significant number of literary texts written by human beings, or members of numerous and extensive amateur author communities, whose work we can read on multiple sites online. By this we mean original texts created by applying literary competence (although this competence is of necessity limited by familiarity with only a fraction of the literary tradition and by a low ability to surpass that tradition) – and for this elementary level of literary creativity, it is irrelevant whether this basic competence was applied by a machine or a human being.

At the level of artistically ambitious or elite literary production, literary creativity has, understandably, different proportions. Essentially these are the same proportions assumed by Zajac and Boden. If, at the elementary level of literary creativity, CoNN functions as an actant legitimizing the presence of artistically weak texts in the literary system, then it will, at the elite level, rather fulfil the role of

a corrective. A neural network can be the originator of an entirely correct text, in the linguistic and formal senses, even one that is compositionally challenging; however, the said text is, of necessity, strongly dependent on older texts, that is, on tradition, which it is unable to transcend. Literary creativity at the artistically ambitious level is, then, subject to this very requirement: in this context, a text may be considered valuable if it has the potential to overturn stereotypes and provoke a re-evaluation of our existing aesthetic attitudes and literary procedures. Thanks to CoNN, it is now clearer than ever before that it is not enough simply to construct the perfect textual structure to create literature (even a machine can do that), but the literary text must be written in an appropriate manner, precisely targeted at the relevant audience, published at the right time, in the right place, in an effective fashion, and so on. Synthetic creation, then, is similarly an implicit call to showcase the concept of artistic literature as communication, not as the mere production of beautiful texts.

But, we think, the field of software research and neural network development offers multiple opportunities to re-evaluate the ways in which the concept of creativity is used. From the reception metatexts and paratextual environment of generative projects themselves (mentioned in the chapters of this book that address the reception and presentation of synthetic works) it is clear that, in the technical discourse, the concept of creativity is sometimes used inappropriately, particularly in situations where the functionality of the given system does not yet have the creative ability to independently produce an original text. That is, the space for using the concept of creativity in a more structured, more critical fashion is also here.

13

The vernacularization of synthetic creation

As we have already indicated in the previous chapter, the culture of neural networks is deeply involved in the conception, indeed the re-evaluation, of human creativity, and entails the ethos of democratizing or vernacularizing itself. And these are precisely the questions we will address in the following pages. But before we start to consider the role of amateur creators within CoNN, the process of establishing neural networks in world literature and art must be described, because access to them was gradually democratized, although over the relatively narrow timeframe of one decade.

In the previous exposition, one of the things we wanted to demonstrate was the fact that the process of establishing artificial neural networks in the world of art and literature – despite the short time in which it has been ongoing – cannot be viewed as a homogeneous movement, but conversely, as an internally structured process. This is another reason why we propose to divide the workings thereof into three successive phases:

1. **The verification phase**: within this phase, the main role played by the human actants of generative processes was not played by artists, by but developers and programmers, who used their literary projects to verify algorithm functionality and the adequacy of the language models they currently had available.
2. **The artistic-subversive phase**: here, artists assumed the leading role in conceiving generative projects; this was no longer about verifying the technology's possibilities or proving its abilities, but fulfilling the conceptual intention, often subversively formulated,

in relation to literary standards or the technologies themselves and the media praxis that this implies.

3. **The vernacular phase:** this phase is characterized by a radically democratizing approach to artificial neural networks that has enabled any enthusiast among internet users to generate literary texts or other artefacts. Within this phase, generative literature becomes a part of pop culture, or rather, amateur literary creativity, and loses its scientific, technological and artistic exclusivity; along with the vernacularization of neural networks, the very process of democratizing authorship enters the next phase, a process that is fundamentally linked to digital culture and the evolution of the media in general.

These phases are models and are not intended to imply opacity or precise timing. Nevertheless, by distinguishing between them, we wish to draw attention to the fact that, in mid-2023, when we finished writing our book, it was no longer possible to speak of applying neural networks across the board when creating literary or other artefacts, but was necessary to differentiate between motivation and the role of individual actants and their different intentions – and the transformations of these facts in time.

From the above, it follows that one of the contexts, or rather, one of the cultures (alongside digital culture, algorithmic culture, etc.) with which CoNN intersects is vernacular culture. We take this term from Henry Jenkins' monograph *Convergence Culture*. Henry Jenkins uses the term vernacular culture to denote culture created by amateurs; he concludes that new digital tools and new distribution networks have increased ordinary people's opportunities to participate in their own culture: "As soon as subculture and fan groups have had a taste of that power once, they will never again become obedient and invisible" (Jenkins 2008: 162). Jenkins' term participatory culture, which is more common and closer in meaning, also comes up here. However, this term is, in our view, almost too tendentiously charged – it contains a certain revolutionary ethos of tearing down

the barricades to give access to public discourse. We, by contrast, are seeking in this book (and our proposed concept of CoNN) to substantiate that the accessibility of so-called artificial intelligence tools is a process ambivalent in value and to view it solely in terms of its democratizing and emancipatory effects would be significantly reductive and distorting.

First and foremost, it would be an error to consider neural networks as the first bearers of this radically democratizing process. This process is inherent to the term new media in the widest sense of the word, and has actually accompanied the development of media and communications technologies since time immemorial (let us not forget the influence of the printing press and the democratization and secularization of education). Moreover, as early as 1936, in his essay "The work of art in the age of mechanical reproduction", Walter Benjamin wrote in connection with the development of the press "that there is hardly a gainfully employed European who could not, in principle, find an opportunity to publish.... Thus, the distinction between author and public is about to lose its basic character" (see Benjamin 1979: 31). In what, then, does the specificity of the role of synthetic neural works lie in this vernacularization process?

If, in work terms, we limit this process from the so-called digital revolution on and thus follow it in the context of digital and post-digital culture, we come of necessity to the concept of web 2.0 as the turning point that opens up vernacular culture to new and, with only a little exaggeration, infinite space for implementation. Open publication platforms (blogs, literary forums, and later, social networks), which before the act of publication did not erect barriers such as editing processes, were understandably hugely galvanizing for amateur creators and rapidly began to boost their cultural position. It was soon evident that the power of the vernacular segment in the literary system would lie primarily in its extent, and thus also in the attractive opportunity for easy participation in public creative activities. Last but not least, from the mid-1990s on, the vernacular segment was boosted by the ethos of eliminating elitist arrogance and

close-mindedness from those who create. Thanks to these qualities, the vernacularization process began to modify the traditional paradigms of literature as a word-based art and a communication system. The ethical and, it can be said, tendentious justification for this process was largely based on arguments in favour of democratizing literary and artistic discourse.

At the same time, however, the question of whether everything that enters public literary communication can really be considered literature (and thus also a subject of interest for literary scholarship, for example) did not disappear. For that matter, one of the authors of the book you are currently reading has addressed this issue in the monograph *Česká literatura a nová média* [Czech literature and new media] (Piorecký 2016). Once the (seemingly) necessary boundary was defined using the concept of literary competence, adopted from the theoretical work of Jonathan Culler, who defined it as the assumption of understanding texts (in the broader concept, including the assumption of their creation), which consists of understanding the rules by which literary discourse functions (see Culler 1975: 114). At the very least, then, a literary work is always part of a certain tradition, follows certain literary (for example, genre) conventions, is situated in a current literary and non-literary context, has intertextual links, intentional or otherwise, or even the fact that certain value frameworks or assumptions function within literary culture (for example, mastery of literary language and its linguistic means, text editing, etc.).

The intersection of the literary system's vernacular zone with the technology and culture of artificial neural networks has fundamentally problematized this definition of the boundary between literature and not-literature. It would be pointless to enquire about the presence or absence of literary competence in synthetic texts where the level of literary education for creating these texts is entirely ambivalent. It is evident that no literary competence of genesis is vitally necessary on the part of either human or technological actants for the creation of a synthetic text able to act as a literary text. The question

of competence itself, however, does not lose in meaning. Rather, it shifts from the field of literature to the field of general communications, which also incorporates the field of communication between humans and machines. In short, the creation of a synthetic artwork certainly assumes a different set of competences than the creation of a literary work by the conventional method.

Generating even the simplest story or poem is not possible without a basic understanding of the methods for formulating prompts or ordering them. If this basic technical-communicatory competence is supplemented by at least basic literary competence, the likelihood increases that an artistically valuable synthetic work will be created (the most successful projects described in this book practically all used this combination of competences). Nevertheless, literary competence may be entirely absent, as a literary text can be created even under such circumstances, albeit at the lowest amateur level. Artificial neural networks have therefore further radicalized the so-called democratization of literature – by removing the final barrier to entering literary discourse, which was the ability to create a text.

Ultimately, then, the culture of neural networks presents the creation of a literary work as a matter of decision-making; as a communicatory act that need not be preceded by anything related to literature, literary tradition, usual rules or similar. In its literary-vernacular form, CoNN *de facto* vindicates Terry Eagleton and his statement that literature has no essence and anything can become literature that is presented and accepted as literature: "Some texts are born literary, some achieve literariness and some have literariness thrust upon them. (…) What matters may not be where you came from but how people treat you. If they decide that you are literature then it seems that you are, irrespective of what you thought you were. (…) There is no "essence" of literature whatsoever." (Eagelton 1983: 8)

The machine readability of texts displaying (at least) an average level of literacy or literary quality is itself a fact that falls into the world of literature and is closely related to value standards – because a text displaying literary quality merely at the level of machine

readability can hardly continue to be accepted as a satisfactory authorial act.

One of the fields which the vernacularization of synthetic creation is finally taking hold is the field of elite literary output, because synthetic creation acts as a corrective to precisely such output, or indeed as a new standard for measuring the uniqueness and "over-engineering" of human creativity. This is confirmed by the words of philosopher Paul Feyerabend, pronounced long before the boom in artificial intelligence, who concluded his book *Science as Art* with the sentence: "Merely rehashing human creative greatness is not only very uninformed, but also very harmful." (Feyerabend 1984: 90)

However, in no way do we wish to position CoNN as the polar opposite to the impetus for vernacularization and thus the further amateurization of literature standing in stark contrast to the world of literary values and elite creation. There is every indication that a democratized approach to generative AI will be used primarily in the form of assisted creativity, which cannot be associated *a priori* with any value sign: anyone could work with a neural network as a writing assistant, a literary amateur, a beginner, or an established professional seeking new motivation. Neural networks may find a broad scope of applications in the field of literary education, be it as a creative writing assistant or as a tool for identifying historical literary styles. Free access to text generators will, however, undoubtedly lead to them being exploited commercially in the cultural industry (popular genres, serial screenplays, and similar).

From the many examples that we have analysed while working on this book, it was clear that ChatGPT (that is, the basic impetus for CoNN vernacularization) tends to affirm the conventional conception of literary genres and to petrify established styles. These texts, which we view as evidence of CoNN vernacularization, unproblematically exploit these conventional conceptions of genre and style, evidently to the satisfaction of their prompters, whose intentions do not include seeking a new literary expression but, on the contrary, finding those signs of literariness that are generally shared and accepted. Here,

however, we wish to indicate that this conventionality is not an insurmountable property of ChatGPT but, when a prompter has sufficient literary competence, imagination and inventiveness, even this chatbot's output could deviate from traditional genre thinking and produce results of surprising artistic value. In other words, the formula creativity that the use of ChatGPT is currently heading towards is not the only possibility, although even it has a legitimate place in contemporary generative praxis (particularly for generating texts in popular genre literature, which is formulaic by its very nature). What is important here is not only the issue of aesthetics and artistic value, but also the issue of ethics relating to a defence of cultural diversity: the experimental approach to generative praxis may expand the options within the creative processes, thus contributing to deconstructing the cultural patterns experienced and to supporting cultural diversity in this way; conversely, the affirmative or formula approach entails risks of homogenizing creations and discouraging creativity. The CoNN vernacularization process can, then, also be viewed as an ethical dilemma.

In our book, we are attempting to contribute to a critical, indeed factual, view of artificial intelligence, including the process of democratizing and vernacularizing it. We have repeatedly encountered uncritical displays of enthusiasm for the democratization of the approach to generative AI tools that are supposed to provide everyone with the opportunity to produce a creative output, regardless of their level of innate talent or acquired skills. When we worked on the chapters about the use of neural networks to create poetry, prose and drama, we also encountered (in addition to other artefacts) the results of attempts by those users who would probably never have written a poetry collection or a book of prose without the help of a neural network, where the only motivation to do so was their willingness, thanks to vernacularized generative praxis, to participate in the symbolic capital still associated with the book as a cultural emblem. We consider these cases, which do not allow an artistic interpretation, but rather a psychological one, as nonsense from the economic perspective and a regrettable mistake from the ecological.

We cannot, then, agree with those theorists of artificial intelligence who see unwavering ethical value in the democratization thereof (such as Ramon Lopez, cited in the previous chapter). Conversely, we claim allegiance with those who perceive the effects of CoNN differentially – such as the authors of the collective monograph *Artificial intelligence and culture. Perspectives for cultural diversity in the digital age* (2022), which discusses the discourse of artificial intelligence in the specific conditions of Brazilian culture: "The popularization of AI-based applications at these stages has enabled processes optimization, and democratization of production, thereby reducing the entry barriers to new professionals joining the cultural sector. Such opportunities are limited, however, because of the digital inequalities that exist in accessing and appropriating technologies in Brazil. From the point of view of creativity, the adoption of AI also introduces new possibilities of experimentation for an innovative aesthetic creation, at the same time that it poses risks, given the potential for homogenization and standardization of the works that are created" (Lima et al. 2022: 129).

CoNN may indeed encourage new circles of authors to create, help them to transcend barriers, accelerate their learning and skills development, and so on – but none of this happens automatically and none of this is an essential characteristic of neural networks. In the same way, it could also negatively affect cultural diversity and result in the homogenization of culture, or even the industrialization of creative activities where they are associated with commercial ends. We have absolutely no wish to warn against using the opportunities that neural networks provide, but we do warn against viewing these opportunities uncritically. We believe that a one-sided view of artificial neural networks as a tool for democratizing culture is one of the mythologizing aspects of so-called artificial intelligence, which we will address in the next chapter.

14

On the myth of artificial intelligence

Machines above machines! /Machines are everywhere, / Swept onto the street, /
Machines can be found, / Even for nocturnal lying / Gents have machines
(A song of demolition for printing presses 1848)

Mythologization is not merely present at the microlevel of specific communication strategies (as we demonstrate in the chapter *Presentation strategies for synthetic textual media*), but is inherent in all of discursive praxis associated with literature generated using artificial neural networks and with artificial intelligence in general. Strong mythologizing tendencies have, in fact, been associated with human creativity for a very long time and are usually connected to romantic conceptions of art and the artist. The idea of artificial intelligence has amplified this mythologizing tendency still further, or rather, shifted it to a certain meta-level relying on the thought that the human soul's creative abilities are so powerful that they were able to create a machine that is creative in and of itself. However, as early as 1951, the German psychologist and phenomenologist Wolfgang Köhler, in a review of the book *Cybernetics* by the American mathematician and philosopher Norbert Wiener, pronounced against the idea of creating an analogy between computers and human intelligence. In his view, a computer, unlike a human being, is merely an "operating system lacking creative 'insight'" (see Bajohr 2021a: 20).

In her book *Creative Mind*, Margaret Boden surmises that exploring computer creativity will allow us to approach exploring and understanding human creativity critically and better: "The answer to our opening question, then, is that there are many intriguing relations

between creativity and computers. Computers can come up with new ideas, and help people to do so. Both their failures and their successes help us think more clearly about our own creative powers." (Boden 2004: 10). Allison Parrish expresses herself in similar terms; in the article "The umbra of an imago: Writing under control of machine learning" she warns that "To some extent, any human endeavour based on data will function primarily as a mirror that shows us little more than our own faces" (Parrish 2020).

These theoretical assumptions must, however, be confronted with cultural praxis. At the level of theoretical and systemic thinking about literature, such as we attempted in chapter 12, we can in fact state that CoNN experimentally calls into question a number of aspects in existing theories of creativity and, within the theoretical discourse, practically prevents any re-evaluation of human creativity and the (frequently, obviously subconscious) pseudo-romantic mythologization thereof. However, the theoretical discourse (which is far from exclusive to this case) is somewhat distant from the cultural praxis associated with synthetic textual media. Instead of demythologizing human creativity, the opposite is happening here: a mythologization of machine creativity and particularly the concept of artificial intelligence itself. This discourse transforms the myth of human creativity as a secret force into some sort of metacreativity or supercreativity of human demiurges who created a creating thing. We see a positive alternative (that could perhaps bring theoretical discourse and general communication praxis closer together) in the approach to mimicry, which enables a reflective, critical presentation of the generated outputs with no need to hide any flaws but which, conversely, can supply them as a playful intention.

While we can certainly emphasize Erik J. Larson's words that "machine learning is only automatic induction" (Larson 2021: 133), synthetic media artefacts are often subject to marketing trends, attempts at novelty and self-presentation in the superlative. As Larson states: "a mythology about a coming superintelligence should be placed in the category of scientific unknowns" and our task in revealing this

unknown is to "invest in a culture that encourages intellectual ideas" (Larson 2021: 280), not to make exaggerated predictions. We need a theory of synthetic textual media that is a real theory and not a mythology of this putative literary mystery.

Neural networks are a technology that is extremely complex, on the one hand, and shrouded in the unknown on the other, which is why nobody can see into their exact technological functioning: "It is arguably the first of humanity's creations that nobody fully understands" (Lifting the lid on AI 2023: 7). As we demonstrated in the chapter on the technological imagination, humanity has been attempting to bring matter to life in human form since ancient times; the first image descriptions and designs for the programmable tool the automatic flautist go back as far as the 9th century and the Islamic Golden Age, and specifically the three Banū Mūsā brothers, who worked in the House of Wisdom in Baghdad. Although imagination has provided a great deal of space for human narratives about mutual need, interdependence or similar suggestions about the predominance of humans or machines and reversals thereof in a wide range of configurations, the modern age has brought them to life via neural networks. If, however, we are going to view propositions on superintelligence (Bostrom 2016), singularity (Kurzweil 2006) and other, similar propositions about the superior intelligence of machines and how they will destroy humanity as a consequence of techno-determinism, as non-scientific suggestions for the modern age with a high degree of relativity, speculation and exaggeration, that is, as myths, we may turn our attention to the social stress produced by neural networks in the modern age. As David Krueger writes in his article "Facing AI extinction", in which he compellingly addresses the reasons for considering the potential extinction risk to humanity caused by AI (AI x-risk): "AI x-risk is admittedly more speculative than important social issues with present-day AI, like bias and misinformation, but the basic solution is the same: regulation" (Krueger 2023: 27).

The discourse on artificial intelligence is interwoven with a complex mythology that can be subdivided into scientific myths and

narrative myths. Scientific myths include the great expectations and unrealistic dreams of progression and predictions that have accompanied AI research since its inception in the 1950s, when scientists were describing everything that AI would achieve within 10 years: a sort of AI Spring in which they would keep it company. Narrative myths constitute a portrayal of AI in the cultural and artistic sphere linked to examples of the technological imagination from the outset and, at the same time, feed contemporary fantasies associated with the technological advances of the last one hundred years, particularly in sci-fi genres extending into the far future (evolutionary sci-fi). These two types of myths, pulsating together in the mythological AI complex, influence each other and jointly create an idea of what people usually imagine under the term AI. The problem arises when myths are not presented as intellectual fun or stimuli, but when humanity is misled by these myths and marketing strategies are the winner. Currently this has reached the stage in which many people are worried about their jobs, positions or future. The commonest AI myths are, then, myths of superintelligence, cognitive superiority over human beings and the AI x-risk, myths that AI has agency, AI will replace human work, AI can solve any problem.

The most common myth that resonates with AI, such as human intelligence being surpassed, is a myth that directly links to the term AI itself. Although currently we only have "narrow AI", it is precisely due to the lack of knowledge about its precise functioning processes (that is, the black box principle) that speculations about AI's cognitive abilities remain the subject of so many conjectures. It is certainly worth considering that a system with very high intelligence will potentially want to liberate itself from human dominance, a narrative fed by many works of science fiction. It is also worth thinking about what can be done today, should such a situation arise, and about what to avoid today, so that we do not need to face such questions in the future. Another myth is the proposition that AI has agency. In many publicized cases, people have said that their AI chat reasoned with them from a position that resonates with the human, for

example, to leave their wives, take their children to hospital or expressed emotional and cognitive commitment in text, in a way that only a sentient being could do. If, however, it was a neural network trained in human communication methods, its responses may well sound human, both emotionally and consciously, because of the nature of human texts.

The myth that the expansion of technology will render human work obsolete has been around since the Industrial Revolution; indeed, the quote at the start of this chapter refers directly to it. Alarmingly, the investment bank Goldman Sachs speculated that the jobs of 300 million people could vanish or be stripped down due to the rapid growth of AI. Meanwhile, however, such huge numbers have not been confirmed anywhere, and new jobs such as prompt engineering have been created.

The idea that AI can solve any problem because it was trained on an enormous quantity of data is a techno-optimistic myth. However, AI is narrowly specialized to perform a specific activity based on a quantity of data and is not able to handle assignments other than the type it was trained for.

Technological myths specifically associated with AI that do not have a narrative counterpart include, for example, that AI, machine learning and deep learning are the same thing (although AI has no precise technological definition); that AI programs can be objective or, conversely, are always unfair; or, as the case may be, that everything in AI depends only on the data set, with no possibilities for further correction.

A visual myth that resonates with the idea of AI is most commonly a white robot or, even more precisely, a female robot who, after serving human beings, gained consciousness and emotions and decided to show humanity what she could do.

All these myths, fed by the hype that attracts users to the relevant software, product, media or entertainment, only confuse the pragmatic and theoretical consideration of the influence of neural networks on modern culture, and distract attention from the problems

associated with training or using neural networks. In the section below we will therefore take a closer look at the ethical issues associated with incorporating neural networks into the culture industry.

THE ETHICAL DIMENSION OF NEURAL NETWORKS IN THE CULTURE INDUSTRY

Unlike the 1950s, when the discourse on artificial intelligence emanated from the ranks of top academics and intellectuals, but also with sufficient relevance and international acceptance in the world of technology, as witnessed by the support for new specialisms in academic institutions and national grants, the modern boom has come into the hands of commercial companies. From the language model BERT, owned by Google, to today's large language models (LLM) in the GPT family by OpenAI, the construction, training and tools for using LLMs are very often in the hands of private BigTech companies. The development of the firm's commercial capital was, for example, the reason why the original non-profit start-up OpenAI, which developed GPT and GPT-2 as freely accessible models that required no technological skill to use, was transformed into a profit-making company when they launched GPT-3 with paid access. Although their massively used chatbot ChatGPT was freely available in the versions GPT-3 and GPT-3.5, the further improved GPT-4 can be accessed via a subscription of USD 20 per month. GPT-4 is promoted by the company as "Our most capable model, great for tasks that require creativity and advanced reasoning." The problem arising for commercial firms, as opposed to academic institutions, is ethical in nature: their research does not have to be published, and thus people do not automatically have information about the sources used to train the models. However, many problems associated with the illegal use of material for training have been identified, to the extent that Italy banned the use of OpenAI Chat on its territory in March 2023 (and lifted this ban less than a month later, allegedly because OpenAI implemented

changes). The legislature of the European Union drew up the AI Act, which focused on AI regulation and created various rules for varying levels of risk. Unacceptable risks include cognitive behavioural manipulation of people or specific vulnerable groups, social scoring, and real-time and remote biometric identification systems, such as facial recognition. High-risk systems are systems used in different products (falling under EU product safety legislation) and systems that will have to be registered in the EU database as biometric identification, management and operation of critical infrastructure, education, employment, access to private and public services, law enforcement, migration, and assistance in legal interpretation and application of the law. "Generative foundation models, like GPT, would have to comply with additional transparency requirements, like disclosing that the content was generated by AI, designing the model to prevent it from generating illegal content and publishing summaries of copyrighted data used for training" (European Parliament 2023).

The rules by which content would be proven to have been generated by an LLM could prevent further instances of incorrect or inappropriate LLM use in various spheres, such as manipulations in the school environment, that is, cases in which the students do not admit that the work as a whole was generated by neural networks. Internal standards are already being developed at individual university level (including Czech and Slovak universities) to govern the use of LLMs for student work (they legalize the use of, for example, ChatGPT and define a referencing method). There is nothing inappropriate in correctly referencing the use of an LLM and using an LLM in some phases of the project, because neural networks already appear as a tool in our society. The question is rather the degree of the LLM's involvement and acknowledging this, or correctly referencing the use thereof. The final guarantee of the authenticity (truth, artistry etc.) of the given text is always the human being whose name is given as the author, because neural networks themselves do not have the agency to create texts or other content. They are a tool we work with. At this time there is no imaginary struggle between humans and neural networks;

what is important here is the right settings for society in questions associated with the correct use of neural networks and, at a higher level, the right power field settings for the big technology companies, to avoid, among other things, the abuse of different types of data.

When the origin of generated content is correctly referenced, we would also avoid, for example, the publicized case of generated books about fungi to which the New York Mycological Society drew attention. These books contained inaccuracies regarding the edibility or harmfulness of specific mushrooms and were sold via Amazon and other platforms with no information about the origin of the text. Although many articles were devoted to warning that Amazon's digital market was filling up with generated books, a journalist on the website Futurism still commented that "experts are warning that this particular flavour of AI-produced garbage might warrant extra concern" (Harrison Dupré 2023).

This extra concern, then, must also apply to various nonfiction books containing information important for human health or seeking expert advice. Journalists advise readers to rely solely on expert authors, because this AI content is packaged, sold and promoted by real people who are only interested in profit and ignore the ethical dimension that is so pressing in these cases.

Ethical issues associated with the use of neural networks to write a text without sufficiently referencing the sources mainly relate to the submission of student assignments, processing tests and other manipulation methods that, while not driven by the tendencies of assisted creativity, are nonetheless intentionally misleading. Another type of perception occurs when using neural networks as personal assistants who help us to communicate more effectively at work, fine-tune the grammar and style of the written text or translate the text into another language for our working (not artistic) needs, or suggest a gift for a friend or plan a holiday. In such cases, we are used to viewing neural networks in the assistant role as helpers and accelerators of working and other processes, which in current, hectic times relieve the users' burdens, at least in part.

The link between neural networks and the increased need for an ethical set-up is particularly pronounced in the systemic and technological settings of neural networks; that is, the composition of the data set. The companies creating neural networks are frequently subject to criticism regarding the training data composition, as the data is often gender biased (see, for example, the paper on gender biases by Sunny Shrestha and Sanchari Das, 2022, which synthesizes many other studies) or race and gender biased. As early as 2016, Joy Buolamwini drew attention to this problem via her Algorithmic Justice League, and convinced some BigTech companies of the need for inclusiveness in gender and race data. As Shrestha and Das point out: "Algorithmic fairness has been a topic of interest in academia for the past decade" (2022). Notwithstanding, unfairness associated with machine learning and AI "is a recent development, discrimination has roots within human society" (2022). This long-term discrimination with a historical backdrop is also responsible for the fact that most automatic assistants that follow commands and help are pre-set for a female voice, but people prefer a male voice when it comes to authoritative statements, or people treat a black robot worse than they treat a white one (see Samuel 2019).

Caution, and the correct data settings representing wider society, are the starting point for liberating ourselves from a permanent battle for the equal rights and status of different genders, races, ages and national groups – both in the data representation and also in real life. Many researchers also draw attention to the huge need to include a mixture of gender, race and national groups when preparing, training and testing LLM data algorithms. Decision-making on the future shaping and shapes of neural networks should not, then, be a tool of a handful of rich white men; rather, a broad spectrum of representatives from social and interest groups should be involved. In this case we would reach a state in which inclusive data representation and the diverse use of technological tools would correlate with the needs of a wide and varied spectrum of user groups.

15

The dawn of the culture of neural networks

We now approach the end of this book, in which we have attempted to ensure that thinking about what is known as artificial intelligence, and its uses in literature and art, is based on rational, dispassionate and critical foundations, and that this thinking is systematic and reflective, at least to a certain extent. Somewhat paradoxically, we have chosen the term culture as the central concept, a term that is well known to be hard to define, vague, but also irreplaceable.

While recognizing all these risks and limitations, we use it and, from a wide range of theoretical concepts attempting to define culture, select the one that is rooted in language and best suits our efforts for discursive and media critique. Chris Barker understands culture as "a set of overlapping performative language-games that flow with no clear limits or determinations within the global whole of human life". He does not think of culture in the singular but rather of cultures in the plural, that form "syncretic and hybridized products of interactions across space" (Barker 2004: 45). This perspective also applies to the culture of neural networks. This is a relatively small cultural complex concerning the broader concept of culture, but it is dynamically evolving, drawing richly from cultural tradition, and developing its own logic, while contributing to the development of this logic with its own impulses. The culture of neural networks is part of a set of cultural complexes or functionally interconnected subsystems, as Ansgar Nünning would say, that share related cultural

logic and language (for many of these complexes, there are already established terms: algorithmic culture, digital culture, network culture, etc.). Algorithmic culture should probably be considered the basis of the cultural formation outlined here, because it is precisely algorithms, as the impetus for performative force, that constitute digital culture and the cultural complexes related to it, as indeed Thomas Levermann has indicated. Levermann also works with the idea of plurality of algorithm-based cultures which are, however, difficult to distinguish: "From a cultural-philosophical perspective, it has been shown that algorithms performatively generate meaning as agents, and constitute a culture of digitality. (…) There is no culture of algorithms, there are only multiple cultures of an algorithmicity that cannot be further demarcated due to their opacity" (Levermann 2018: 40).[49]

At this moment, however, we hand the task of more precisely defining the culture of neural networks in the contexts mentioned to culturologists or cyberneticists. Capturing the process of its dawn and early existence was within our powers only where it was linguistically manifested (and constituted) and where it materialized in literary or other artistic artefacts. We monitored CoNN particularly where it intersected with literary (or also visual, musical, intermedial) culture and we asked what outcomes artificial neural networks had so far produced for the life of literature or other arts.

What, then, has artificial intelligence, or as we prefer to call it, the culture of neural networks, been able accomplish in the worlds of literature and art? We believe that there have been results in two areas in particular. One of them is undoubtedly the vernacularization of literature and art. This, understandably, is a long-term matter and definitely did not arrive at the same time as artificial neural networks,

49 „Es wird aus kulturphilosophischer Perspektive gezeigt, dass Algorithmen als Handlungsträger performativ Bedeutung generieren und eine Kultur der Digitalität konstituieren. (…) Es gibt nicht eine Kultur der Algorithmen, es gibt nur multiple Kulturen einer Algorithmizität, die aufgrund ihrer Opazität nicht weiter abgegrenzt werden können."

because it is an organic part of media history (starting with printing, which contributed to the democratization of education that, until then, had been confined to scribes' workshops in monasteries). Neural networks, of course, moved the process of involving amateurs in the life of literature a long way forward, one step at a time, including the – until recently – still unimaginable and crazy sounding removal of the last "barrier" to entering literature – that is, the ability to write a (literary) text. This ability is in fact not necessary, and this is proved by multiple generated books on Amazon. On the other hand, a need for new competences has arisen; these include the ability to construct a meaningful and effective prompt that will induce the neural network to create an output that can be used as literature. And everyone will need this competence, even those who involve neural networks in their creative activities only occasionally, as a partial source of inspiration, for example.

The other large area in which the culture of neural networks has done its unforgettable work is the area of self-reflection in literature and art as a method of communication. It recently asked the basic question of who is actually an author, and uncompromisingly drew attention to the need to see even technical actants in the creative process as active co-creators of the resulting work (as a matter of fact, the typewriter, for example, used to be such a co-creator, although this was not evident). At the same time, neural networks have stripped authorship of any sort of pseudo-mystic aura that it had until recently – that is, there is no longer any doubt that a poem with the deepest spiritual effect, but also a poem that seeks to impose the impression of recording raw reality, can be convincingly completed with no contact whatsoever with spirituality or life experience. Even the reader or, more accurately, the reading process itself, was however compelled to a deeper process of self-reflection within the culture of neural networks. In the context of the literature created by machines, although it may not be obvious at first glance, it is, when reading, hard to avoid the questions about how the text was in fact created, how it bears witness to its data sources, and the like. And

so, when we read a generated text as if it were a human text, we join a conscious game, we grant the text in question the right to its mimicry and we devote ourselves to literally self-reflexive metareading.

Neither of these two areas saw any transformations before the advent of artificial neural networks. Like every segment of live culture, the vernacularization and self-reflectiveness of artistic cultures have a long-term dynamic. We are now "merely" witnesses of a significant acceleration in these dynamics and, again, this is not due to something fundamentally new but, on the contrary, to ever more successful attempts to effectuate age-old ideas of constructing an artificially thinking being, which throughout history has resembled a myth, works of art or scientific theories.

We now find ourselves in an era that seeks, or so it seems, to bring one such theorem (artificial intelligence) into everyday life. Frequently, however, the imaginative nature of artificial intelligence is forgotten, as is the fact that it is an archaic dream, not a real construct. As Phil Turner has pointed out, people tend to ignore their technological imagination because they focus on solving specific problems or engaging in creative activities, forgetting that they are using tools that activate their technological imagination (or have grown from it) (see Turner 2020: 123).

Among other things, we wanted to emphasize in this book that, when we think and talk about artificial intelligence, we are discussing a set of ideas that should not be confused with reality. They should not deceive us or anyone else, let alone frighten anyone. We offer the concept of the culture of neural networks as a path to self-awareness of this imaginative process and its critical reflection.

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List of Illustrations

Editorial Note

Working versions of some chapters have previously been published in journals. These papers are:

Piorecký, K. — Husárová, Z. (2019). Tvořivost literatury v éře umělé inteligence. *Česká literatura* 67(2), 145–169.

Husárová, Z. — Piorecký, K. (2022). Reception of literature generated by artificial neural networks. *World Literature Studies* 14(1), 44–60.

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