

# Posudek diplomové práce

Matematicko-fyzikální fakulta Univerzity Karlovy

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**Studijní program** Informatika

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**Autor posudku** Mgr. et Mgr. Filip Děchtěrenko, Ph.D.

**Role** Vedoucí

**Pracoviště** KSVI

## Text posudku:

In this thesis, the author focused on the research question, of whether we can predict accuracy in Multiple Object Tracking tasks based on properties of individual trials. This task is commonly used for studying divided attention and its benefit is a possible formalization for the creation of further models. In particular, the student was given a dataset from one previous study, and based on the models from previous research, he created several simple per-frame descriptors. He used these averaged descriptors as predictors for tracking accuracy in the task. In the next part, he selected two of the descriptors and created modified trials, in which some objects have different trajectories in the critical moment, which was shown as difficult based on descriptor value. Finally, he prepared, measured, and analyzed an experiment, in which he tested, whether this manipulation actually lead to improved tracking accuracy. I described the actual work done in greater detail, as this main motivation is not salient enough in the thesis. The thesis is divided into five chapters.

In the first chapter, the author describes the bare minimum for understanding the topic. This section was easy to read and the author nicely summarized attentional models explaining the task. On the other hand, the author did not mention visual attention, which is crucial for understanding the task. Also, I would suggest some sections linking the current literature to the research question.

The second chapter describes some selected statistical models. I do not understand the purpose of this section, as this thesis is not about the mathematical properties of GLM models. The whole section could be removed with zero impact on the presented work. The only defensible exception is subsection 2.3, in which the author describes effect sizes, which are common nowadays reported and still little unknown to some fields. On the other hand, the author could have written about actual models used in MOT, which are reliant on eye movements.

The third and fourth chapters describe actual work. The structure is a little bit difficult to read. The author actually did two studies (first simulation, second actual experiment), which is not clear from the current structure. Methods are a little unbalanced in their brevity. Some parts are unnecessarily descriptive (such as examples of the data), while others should be described in more detail. One particular section is the description of the metrics. It is not clear, how they were computed. Adding at least some schematic visualizations would help. The actual experiment was nicely written, although the results are brief.

The final chapter regarding discussion is also kind of brief. I would expect at least possible implications of the current study for future research in MOT. For example, methodology in the thesis could be used for verifying competing models (such as here the crowding is shown as a possible factor influencing tracking instead of centroid).

In general, the thesis is rather brief and it seems that it was written in hurry (e.g. typos in references). At least the whole of Chapter 2 and the usage of a lot of tables seemed that they were used to bloat the text. This was not necessary, as some important parts (actual MOT models or more detailed descriptions of metrics) could be easily added.

Although the thesis has severe flaws, I think that it is defensible, as the author did a sufficient amount of work. I am keen to hear the defense.

**Práci doporučuji k obhajobě.**

**Práci nenavrhuji na zvláštní ocenění.**

*Pokud práci navrhuje na zvláštní ocenění (cena děkana apod.), prosím uveďte zde stručné zdůvodnění (vzniklé publikace, významnost tématu, inovativnost práce apod.).*

**Datum** 25. ledna 2023

**Podpis**

