

Advisor's review of master's thesis

Thesis author: Daragh Meehan
Thesis title: Learning Multiple Languages Through Parallel Audiovisual Input
Advisor's name: Jiří Hana
Advisor's affiliation: Charles University, MFF, ÚFAL

The thesis investigates the use of audiovisual input (short captioned and dubbed videos) in learning multiple foreign languages simultaneously. There are two main results of the thesis:

- a language learning application written in Python. The application creates an interactive multilingual text based on videos with multiple audio tracks and subtitles. It displays on-demand translations and dictionaries, and creates multimedia vocabulary flashcards.
- experiments measuring the effectiveness of learning two new languages simultaneously using audiovisual input in various settings.

The thesis presents a substantial amount of work. The text itself is 155-page long (103 pages of the main text, 22 pages of appendices, and 19 pages of bibliography).

Content

The thesis consists of five chapters:

- **Chapter 1. Introduction:** Introduces the concept of using audiovisual input (AVI) for learning multiple languages simultaneously. The chapter proposes 10 research questions, organized into groups addressed by literature review, experiments and application development. Given the scope of a master's thesis, the number of research questions could have been reduced.
- **Chapter 2. Theoretical Background:** Reviews literature on second language acquisition, computer-assisted language learning, and multilingualism. The author focuses on the role of audiovisual input and its combination with vocabulary learning strategies. The chapter also discusses the role of parallel texts, flashcards and spaced repetition. All the content is heavily referenced.
- **Chapter 3. Language Learning Experiment:** Describes an experiment with 35 English speakers divided into 3 groups: a control group and two groups watching a TV show (Peppa Pig) in English, Dutch, and Italian, switching between languages either after short segments or after the whole episode. Learning is assessed by vocabulary acquisition. The latter two groups show significant vocabulary gains in both new languages. The number of participants is rather small, but for a master's thesis, this is acceptable. The experiments yielded a lot of data. Given the number of participants and their diverse language-learning backgrounds, the reliability of the results is questionable. In fact, it would be probably better to focus on a smaller number of questions and leave the rest for further research with a larger number of participants.
- **Chapter 4. Language Learning Computer Program:** Describes the design, architecture and use of a multilingual study tool used in the experiments.
- **Chapter 5. Conclusion**

Code

The application developed as part of the thesis processes videos with audio tracks and subtitles in multiple languages and creates several types of learning resources: interactive parallel texts, video segments, and multimedia flashcards.

The code is well organized. It follows common Python coding standards (adheres to PEP8 style, consistently uses type hints, etc.). It is well documented using docstrings. Chapter 4 of the thesis provides a good overview of the architecture, input/output, the 3rd-party libraries, dictionaries and translation APIs used, etc. It also presents the tool from a user's perspective.

Language, formatting and typography

The thesis is very well structured, the text is polished and easy to follow. There are numerous examples, screenshots etc. I did not notice any grammar/spelling errors.

The formatting and typography are clean. However, the officially submitted version uses Latex draft mode, the numbers in tables should be right-aligned, and captions should have a shorter version for the List of Figures/Tables. These issues are fixed in a newer version of the text uploaded to GitHub.

Conclusion

The thesis presents a significant amount of work. Also, it was a pleasurable and informative reading.

Recommendation for defense:

I recommend the thesis for defense.

Prague, September 6, 2024

Jiří Hana