

Review of Master Thesis

Faculty of Mathematics and Physics, Charles University

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Title An investigation of the task of Universal Semantic Tagging using Neural Architectures, Multi-task Learning, and Multi-lingual Learning
Year 2018
Study Programme Informatika **Field of Study** Matematická lingvistika

Reviewer Mgr. Barbora Vidová Hladká, Ph.D. **Role** Vedoucí
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Review:

The goal of the thesis is exploring the task of Universal Semantic Tagging (UST) using the concepts of transfer learning, multi-task learning, and multi-lingual learning. The tasks of UD POS tagging, Combinatory Categorical Grammar tagging, and UD relation tagging are used as auxiliary tasks for UST. The tasks of Universal Dependency Parsing and Natural Language Inference are investigated using UST as an auxiliary task. All the presented experiments apply Deep Learning methods.

The thesis consists of Introduction, four regular chapters, Conclusion, and References. Introduction provides a motivation to the thesis and examples illustrating the UST task. In addition, it outlines four research questions that the study addresses. Chapter 1 introduces theoretical foundations for the experiments and highlights the most relevant works in the given area. Chapters 2-4 form the core of the thesis. Each of them is devoted to a particular research question – which sequence labeling tasks can help with semantic tagging and vice versa, which more complex tasks can benefit from semantic tagging, and can multilingual approaches help with semantic tagging low resource languages. Finally, Conclusion summarizes the main findings for each research question with respect to the published works. The list of bibliographies consists of impressive number of items, namely 98.

Overall comment

The overall impression from the thesis is very good. Both the topic and the methodologies under investigation represent the current trends in NLP. I want to point out the paper *What can we learn from Semantic Tagging?* by Mostafa Abdou, A. Kulmizev, V. Ravishankar, L. Abzianidze, J. Bos accepted as a short paper for the EMNLP 2018 conference. This paper describes the findings on one of the research questions presented in the thesis.

The thesis is well and clearly structured. The core chapters have the same structure so that readers can

easily follow the steps of the experiments, i.e. task description(s), data description, learning method and its parameters, results and their evaluation and discussion. I really appreciate a careful and thorough literature review presented in the thesis.

Comments and questions

- I am curious about your motivation to address the UST task which I can see as a rather expensive task with respect to getting annotated data.

I **recommend** this thesis for the defense.

Date September 4, 2018

Signature