THESIS SUPERVISOR'S REPORT

I. IDENTIFICATION DATA

Thesis title:	**Mapping the Internet — Modelling Entity Interactions in Complex Heterogeneous Networks**
Author's name:	**Mandlík Šimon**
Type of thesis :	Master Thesis
Faculty/Institute:	Faculty of Electrical Engineering
Department:	Department of Computer Science
Thesis reviewer:	Tomáš Pevný
Reviewer's department:	Department of Computer Science

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	A
How demanding was the assigned project?	
The assignment is slightly above my average.	

Fulfilment of assignment	A
How well does the thesis fulfil the assigned task? Have the primary goals been achieved? Which assigned tasks have been incompletely covered, and which parts of the thesis are overextended? Justify your answer.	
The assignment was fulfilled more than completely, as the student the thesis is a very comprehensive introduction into the problem of multi-instance learning, its generality, and its relation to the graph neural networks. The experimental section demonstrates the framework on three very different problems, each of which is non-trivial to solve by standard machine learning tools.	

Activity and independence when creating final thesis	A
Assess whether the student had a positive approach, whether the time limits were met, whether the conception was regularly consulted and whether the student was well prepared for the consultations. Assess the student's ability to work independently.	
The student was very active and independent during his work on the thesis. Needless to say that he has a major impact on the creation of Mill.jl library for general multi-instance learning, which has to date 31 stars on GitHub (which are roughly equivalent to citations). Because he has been pioneering the field, we could not rely on third-party solutions.	

Technical level	A
Is the thesis technically sound? How well did the student employ expertise in his/her field of study? Does the student explain clearly what he/she has done?	
The level if the thesis is good. The student has demonstrated he can master theoretical and also the practical aspect of the problem.	

Formal level and language level, scope of thesis	A

Are formalisms and notations used properly? Is the thesis organized in a logical way? Is the thesis sufficiently extensive? Is the thesis well-presented? Is the language clear and understandable? Is the English satisfactory?

Language and the scope is good.

Selection of sources, citation correctness   A

Does the thesis make adequate reference to earlier work on the topic? Was the selection of sources adequate? Is the student's original work clearly distinguished from earlier work in the field? Do the bibliographic citations meet the standards?

10 pages of relevant citations demonstrates that the student knows the importance of referring to prior art and supporting of his claim.

Additional commentary and evaluation (optional)
Comment on the overall quality of the thesis, its novelty and its impact on the field, its strengths and weaknesses, the utility of the solution that is presented, the theoretical/formal level, the student's skillfulness, etc.

Please insert your comments here.

III. OVERALL EVALUATION, QUESTIONS FOR THE PRESENTATION AND DEFENSE OF THE THESIS, SUGGESTED GRADE

I have worked with Simon for more than three years and together, we have pioneered the use of multiple-instance learning in the modeling of structured data (JSONs, XMLs, ProtoBuffers). In this work, Simon was focusing on the application of the framework on graphs, as he has seen its potential for flexible modeling of real-world data. This thesis is thus a nice summary of what he has done, but more importantly a very comprehensive introduction into the topic. It covers recent theoretical progress, computational complexity, and experimental demonstration on three different problems. Needless to say that each problem would require extensive feature engineering if one would prefer to solve it using standard machine learning tools accepting tensors of fixed size.

Last but not least, since we have been pioneering the field, we could not rely on any third-party library and we had to write it ourselves.

To conclude, I would like to take the opportunity to recommend the thesis to dean's award.

The grade that I award for the thesis is **A**

Date: 12.6.2020   Signature: