



# Supervisor's statement of a final thesis

**Supervisor:** Rodrigo Augusto da Silva Alves, Ph.D.  
**Student:** Bc. Daniel Bohuněk  
**Thesis title:** Graph-Based Fraud Detection in Recommender Systems  
**Branch / specialization:** Knowledge Engineering  
**Created on:** 3 June 2024

## Evaluation criteria

### 1. Fulfillment of the assignment

- ▶ [1] assignment fulfilled
- [2] assignment fulfilled with minor objections
- [3] assignment fulfilled with major objections
- [4] assignment not fulfilled

The assignment was fulfilled with great quality.

### 2. Main written part 100/100 (A)

In this thesis, Bc. Daniel Bohuněk designed and implemented a novel graph-based semi-supervised approach for detecting fraud in recommender systems. The proposed method includes a new heterogeneous graph convolution operator and two versions of a siamese graph neural network, resulting in state-of-the-art performance. The thesis is well-structured and written scientifically, with technical background. I would like to highlight the quality of the graphical elements and detailed explanations.

### 3. Non-written part, attachments 100/100 (A)

The code is well-structured and optimized, although it would benefit from some explanations and comments for better understanding. However, I acknowledge the difficulty of developing such methods, which are generally found only in state-of-the-art research.

### 4. Evaluation of results, publication outputs and awards 100/100 (A)

The experimental results presented in the thesis, combined with the underlying theory, allow us to aim for submission to a top-tier venue.

## 5. Activity of the student

- ▶ [1] excellent activity
- [2] very good activity
- [3] average activity
- [4] weaker, but still sufficient activity
- [5] insufficient activity

Daniel Bohuněk is an excellent student whom I highly recommend to continue his studies to a doctoral level given his potential. He possesses strong abilities and a deep understanding of complex concepts in machine learning. He consistently came prepared for our meetings, easily understood the advisor's instructions, and or followed through or proposed good solutions. Very often, the results exceeded my expectations.

## 6. Self-reliance of the student

- ▶ [1] excellent self-reliance
- [2] very good self-reliance
- [3] average self-reliance
- [4] weaker, but still sufficient self-reliance
- [5] insufficient self-reliance

The student demonstrated excellent self-reliance. He is capable of make decisions and solutions by himself.

## The overall evaluation

100 /100 (A)

The thesis is of excellent quality and I strongly recommend for Dean's Thesis Award.

## **Instructions**

### **Fulfillment of the assignment**

Assess whether the submitted FT defines the objectives sufficiently and in line with the assignment; whether the objectives are formulated correctly and fulfilled sufficiently. In the comment, specify the points of the assignment that have not been met, assess the severity, impact, and, if appropriate, also the cause of the deficiencies. If the assignment differs substantially from the standards for the FT or if the student has developed the FT beyond the assignment, describe the way it got reflected on the quality of the assignment's fulfilment and the way it affected your final evaluation.

### **Main written part**

Evaluate whether the extent of the FT is adequate to its content and scope: are all the parts of the FT contentful and necessary? Next, consider whether the submitted FT is actually correct – are there factual errors or inaccuracies?

Evaluate the logical structure of the FT, the thematic flow between chapters and whether the text is comprehensible to the reader. Assess whether the formal notations in the FT are used correctly. Assess the typographic and language aspects of the FT, follow the Dean's Directive No. 52/2021, Art. 3.

Evaluate whether the relevant sources are properly used, quoted and cited. Verify that all quotes are properly distinguished from the results achieved in the FT, thus, that the citation ethics has not been violated and that the citations are complete and in accordance with citation practices and standards. Finally, evaluate whether the software and other copyrighted works have been used in accordance with their license terms.

### **Non-written part, attachments**

Depending on the nature of the FT, comment on the non-written part of the thesis. For example: SW work – the overall quality of the program. Is the technology used (from the development to deployment) suitable and adequate? HW – functional sample. Evaluate the technology and tools used. Research and experimental work – repeatability of the experiment.

### **Evaluation of results, publication outputs and awards**

Depending on the nature of the thesis, estimate whether the thesis results could be deployed in practice; alternatively, evaluate whether the results of the FT extend the already published/known results or whether they bring in completely new findings.

### **Activity of the student**

From your experience with the course of the work on the thesis and its outcome, review the student's activity while working on the thesis, his/her punctuality when meeting the deadlines and whether he/she consulted you as he/she went along and also, whether he/she was well prepared for these consultations.

### **Self-reliance of the student**

From your experience with the course of the work on the thesis and its outcome, assess the student's ability to develop independent creative work.

### **The overall evaluation**

Summarize which of the aspects of the FT affected your grading process the most. The overall grade does not need to be an arithmetic mean (or other value) calculated from the evaluation in the previous criteria. Generally, a well-fulfilled assignment is assessed by grade A.