FACULTY
OF INFORMATION
TECHNOLOGY
CTU IN PRAGUE

Supervisor's statement of a final thesis

Supervisor:	Rodrigo Augusto da Silva Alves, Ph.D.
Student:	Bc. Martin Kostrubanič
Thesis title:	Football outcomes prediction with tensor completion embeddings
Branch / specialization:	Knowledge Engineering
Created on:	5 June 2023

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

Martin Kostrubanič successfully fulfilled the assignment by thoroughly investigating tensor completion methods and modeling outcome football prediction problem as a 3D tensor. In this tensor representation, the first dimension corresponds to the home team, the second dimension represents the away team, and the third dimension signifies the season. An entry is the result of a match. Moreover, the thesis features coherent and comprehensive sections on related work, providing a thorough overview of the existing literature. Additionally, there is an experimental section that encompasses four datasets, allowing for a unbiased analysis. The introduction includes the motivation behind the research, while the conclusion highlights the main results of the work.

2. Main written part

98 / 100 (A)

The thesis is effectively written and well-structured, making it easy to understand the author's contributions. The related work section provides detailed explanations of the relevant models, offering a comprehensive understanding of the field. The summary at the end of Section 2 effectively positions the work within the existing literature. In the second section, the theoretical background is presented, providing a reasonable explanation of the model. The student focuses on explaining how to model football matches as a tensor, which adds clarity to the research. The experiments section provides valuable insights into the dataset and thoroughly discusses the results. However, the explanation of the validation procedure, particularly in Figure 4.11, could be improved without compromising the overall findings.

3. Non-written part, attachments 98 /100 (A)

The code is well-written and the provided notebooks make it easier to understand how the experiments were executed.

4. Evaluation of results, publication outputs and awards 94 /100 (A)

Overall, the achieved results are satisfactory for the field, demonstrating metrics that are comparable to state-of-the-art performance. I appreciate the two strands of experiments proposed in the methodology, which showcase the potential of tensor completion for football prediction. However, I believe there would be a substantial improvement in the method's potential for publication if these strands were combined in a way that leveraged the strengths of the work. Although I strongly recognize the student's performance in fulfilling the assignment, the results are limited in terms of publication potential due to the absence of a consolidated methodology, which requires further study.

5. Activity of the student

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

Martin Kostrubanič is an excellent student. He consistently demonstrates exceptional capabilities, punctuality, and a strong work ethic. Throughout our several meetings, he consistently arrived on time and displayed attentiveness to the advice provided.

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 showcased an impressive ability to develop independent and creative work. However, to enhance the overall quality of the thesis, it could have been beneficial to have better communication and a more balanced approach, combining self-directed work with consulting and advisory during the methodology design phase.

The overall evaluation 97 /100 (A)

The student has successfully fulfilled the assignment, presenting a polished thesis with an experimental section that incorporates four datasets across two experimental strands. Based on these achievements, I strongly recommend the approval of the thesis.

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.