Review report of a final thesis

Reviewer: Rodrigo Augusto da Silva Alves, Ph.D.
Student: Bc. Michael Kolínský
Thesis title: Counterfactual Learning-to-Rank in Personalized Search
Branch / specialization: Knowledge Engineering
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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

In this thesis, the student proposes a complex counterfactual framework in information retrieval. In my opinion, the student goes beyond the requirements by including an extensive theory and methods section and a thorough experiments section.

2. Main written part   94 / 100 (A)

The written part of the thesis is well executed, with a smooth flow of ideas. The student demonstrates a good understanding of the subject matter by not only citing relevant previous works but also providing derivations to explain concepts. This level of detail and rigor is noteworthy, particularly for a master's thesis in the area of information retrieval/ recommendation systems. The experiments section is well-written, and the results are appropriately discussed. It's worth noting that the student goes beyond conventional approaches and explores less mainstream methods, such as the EM framework. This demonstrates a deeper understanding of the techniques and mathematical foundations involved. One area that could be improved is the positioning of the work in the existing literature. The introduction appears rather brief, and I believe that expanding it to include a motivation for the research and a discussion of the current state of the art would have been a valuable enhancement. However, it's important to mention that despite this limitation, the overall quality of the work remains strong.

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

The experimental section is noteworthy in this study. The code is well-organized, engineered, and reasonably commented, indicating a high level of effort.

4. Evaluation of results, publication outputs and awards $\quad$ 100 /100 (A)

I believe some few modifications in the methodology are necessary for publication. I recognize the high value of the results presented in the thesis for practical applications. It is important to highlight that the results were effectively presented. I particularly appreciate the use of scales in the graphs, which accurately represent the results without any undue exaggeration. Furthermore, the discussion is comprehensive, addressing specific details of the results in relation to the implementation.

The overall evaluation $\quad$ 96 /100 (A)

I find the thesis to meet the high standards expected of a master's degree. Therefore, I highly recommend its approval. I particularly appreciate the inclusion of Chapter 2, which provides valuable context, as well as the comprehensive development of Chapters 4 and 5, which contribute significantly to the overall application of the thesis.

Questions for the defense

(1) As future work, the author proposes investigating the framework in an online environment. However, from a research perspective, could you please provide insights into areas where certain limitations should be further investigated?
(2) How does the framework proposed in this thesis compare to other relevant methods existing in the literature from a novelty perspective?

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.

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.