



Review report of a final thesis

Reviewer: Rodrigo Augusto da Silva Alves, Ph.D.
Student: Bc. Michal Bacigál
Thesis title: Design and Implementation of Machine Learning Operations
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

Michal Bacigál presented a thesis that delves into a case study investigating the design and implementation of an architecture for Machine Learning Operations (MLOps). The thesis consists of six main-text chapters along with four appendices chapters. The thesis effectively fulfills the assignment's requirements (although some small adjustments were made and justified) by exploring the design and implementation of an architecture for MLOps in a case study. It covers the essential aspects of the topic, such as addressing a complex real-world problem and successfully implementing the MLOps stack. Additionally, the thesis provides a thorough description of the tools used, including detailed technical insights and discussions on the implementation process.

2. Main written part

90/100 (A)

The thesis is written in a clear and coherent way, making it easy to follow and comprehend. I particularly liked the inclusion of Table 2.5, which provides a valuable comparison of the reviewed workflow tools, and Figure 4.1 and its description that effectively described the architecture being discussed. However, there is room for improvement in the titles of certain sections within Section 5. Instead of using file names, it would be more appropriate to utilize academic language that clearly reflects the role and significance of the respective components. Note that these issues do not significantly affect the overall quality of the thesis.

3. Non-written part, attachments

95 /100 (A)

The code presented in the thesis is organized and demonstrates a clear structure, making it easy to understand and follow. The main text effectively helps to understand it.

4. Evaluation of results, publication outputs and awards

98 /100 (A)

From my perspective, the thesis addresses a practical problem that holds significant potential for application in important yet straightforward contexts. However, it may not be suitable for scientific outputs, such as scientific publications.

The overall evaluation

93 /100 (A)

I acknowledge the thesis as a strong piece of work that addresses a challenging problem, requiring the author to thoroughly research, understand, and effectively communicate various tools. The conclusion rightly highlights that implementing an example covering the entire life cycle would warrant a separate thesis due to its complexity. However, it would have been beneficial to have a more in-depth discussion within the text about why creating a simple toy example presents significant difficulties. It is not fully cleared for me. Exploring the specific obstacles and limitations that prevented the inclusion of such an example in the thesis would have provided valuable insights and enhanced the overall understanding of the topic.

Questions for the defense

Why is it challenging to building a toy example project within the presented solution that encompasses the entire lifecycle?

How can new trends in machine learning, such as fairness and interpretability, be effectively integrated into MLOps practices?

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.