Přírodovědecká fakulta
Faculty of Science

Jihočeská univerzita v Českých Budějovicích
University of South Bohemia in České Budějovice

# OPPONENT'S REVIEW ON ~~BACHELOR~~/DIPLOMA[1] THESIS

**Name of the student:**

**Thesis title:** Predicting spectral channels related to mineralogy from CRISM spectral bands using deep learning

**Supervisor:** Elser Benedikt

**Opponent:** Hamidreza Namazi, Ph.D.
**Opponent`s affiliation:** University of South Bohemia, Faculty of Science, Department of Computer Science

| | Point scale[2] | Points |
|---|---|---|
| **(1) FORMAL REQUIREMENTS** | | |
| **Extent of the thesis** (for bachelor's theses min. 20 standard pages, for master's theses min. 30 standard pages)**, balanced length of the thesis parts** (recommended length of the theoretical part is max. 1/3 of the total length)**, logical structure of the thesis** | 0-3 | 2 |
| **Quality of the theoretical part (review)** (number and relevancy of the references, recency of the references) | 0-3 | 1 |
| **Accuracy in citing of the references** (presence of uncited sources, uniform style of the references, use of correct journal titles and abbreviations) | 0-3 | 2 |
| **Graphic layout of the text and of the figures/tables** | 0-3 | 2 |
| **Quality of the annotation** | 0-3 | 2 |
| **Language and stylistics, complying with the valid terminology** | 0-3 | 2 |
| **Accuracy and completeness of figures/tables legends** (clarity without reading the rest of the text, explanation of the symbols and labeling, indication of the units) | 0-3 | 1 |
| **Formal requirements – points in total** | | **12** |
| | | |
| **(2) PRACTICAL REQUIREMENTS** | | |
| **Clarity and fulfillment of the aims** | 0-3 | 1 |
| **Ability to understand the results, their interpretation, and clarity of the results, discussion, and conclusions** | 0-3 | 1 |
| **Discussion quality – interpretation of the results and their discussion with the literature** (absence of discussion with the literature is not acceptable) | 0-3 | 1 |
| **Logic in the course of the experimental work** | 0-3 | 2 |

[1] Strike out what does not apply.
[2] Points: 0-unsatisfactory, 1-satisfactory, 2-average, 3-excellent.

| | | |
|---|---|---|
| **Completeness of the description of the used techniques** | 0-3 | 2 |
| **Experimental difficulty of the thesis, independence in experimental work** | 0-3 | 1 |
| **Quality of experimental data presentation** | 0-3 | 2 |
| **The use of up-to-date techniques** | 0-3 | 1 |
| **Contribution of the thesis to the knowledge in the field and possibility to publish the results** (after eventual supplementary experiments) | 0-3 | 1 |
| **Practical requirements – points in total** | | **12** |
| | | |
| **POINTS IN TOTAL (MAX/AWARDED)** | **48** | **0** |

**Comments of the reviewer on the student and the thesis:**

1) While the literature review covers relevant prior work, it could benefit from further exploration of the latest advancements in diffusion models and their applications to similar tasks in other domains.
2) The methodology section could provide a more detailed explanation of why certain models were chosen over others. For instance, more discussion around the limitations of U-Net models in comparison to stable diffusion would strengthen the rationale for model selection.
3) The thesis employs various performance metrics like RMSE, SSIM, and LPIPS, but the results could be further enriched by discussing the trade-offs between these metrics and how they impact model performance in real-world applications.
4) As I checked, the thesis has a high similarity index, and some paragraphs have been copied and pasted from other sources. The candidate should reduce the similarity index.

**Suggestions and questions, to which the student has to answer during the defense:**

**Conclusion:**

**In conclusion, I**

**r e c o m m e n d**

**the thesis for the defense and I suggest the grade Good (3).**[3]

[3] Suggested grade, which can be modified during the defense based on the presentation. If the reviewer is not present at the defense, the grade will not be counted. Grades: Excellent (1). Very good (2), Good (3), Unsatisfactory/failed (4).