# OPPONENT´S ASSESSMENT ON DIPLOMA THESIS

**Student´s name and surname:**     **Bc. Jan Bayer**

**Name of the diploma thesis:**     **Inferring wall pressure spectral model using neural networks**

**Supervisor of the thesis:**     **prof. Ing. Karel Fraňa, Ph.D.**

**Opponent:**     **Prof. Miguel Alfonso Mendez (EA Assistant Professor)**

## 1. Diploma thesis evaluation

| Evaluation | excellent | excellent minus | very good | very good minus | good | failed |
|---|---|---|---|---|---|---|
| Meeting the goal and fulfilling task of the thesis | | X | | | | |
| Quality of conducted survey | X | | | | | |
| Methodology of solutions | | X | | | | |
| Expert level of the thesis | X | | | | | |
| Merit of the thesis and its potential applicability of results | X | | | | | |
| Formal and graphic level of the thesis | X | | | | | |
| Student´s personal approach | | X | | | | |

*Mark **x** in the corresponding box.*
*Supervisor´s final evaluation is based on his/her overall subjective evaluation.*
*Grading is stated literally in the article no. 5, neither by a number, nor by a letter.*

## 2. Comments and remarks on diploma thesis:

I think Jan did an excellent job. He has raised very valid research questions and tackled them with appropriate scientific methodology. He implemented interesting and complex machine learning architectures and analyzed his regression results critically. He carried out an extensive survey of the literature and positioned his work well. His learning rate was excellent, and he proved capable of putting things into practice very quickly. He showed a strong sense of responsibility and eagerness to learn, always keeping a positive attitude. The only minor aspects where I feel he could have done better is the time management of the manuscript preparation: we, at VKI, had almost no time to review the manuscript before the final submission.

## 3. Questions about diploma thesis:

When tackling the history effect in the pressure wall spectra, Jan's proposed implementing convolutional neural networks as tools for making the information at location x also depend on location at x+N and x-N. This was a great and well-implemented idea.

My questions are: was the convolutional architecture the only possibility to build such a dependency? Why was this approach better than a fully connected network do the same kind of mapping?

Finally, what could be the physical mechanism that makes the information travel backwards in the problem at hand? Would that have a different impact on different portions of the spectra?

**4. Opponent´s statement whether the diploma thesis meets the academic title requirements and whether it is recommended for defense:**

I have no doubt Jan's manuscript meets the requirements for an excellent master thesis and I strongly recommend he proceeds with the defense.

**5. Opponent´s grading:**

I would grade his work in the upper 10% of the scale among all the students I have supervised. This corresponds to 'Excellent' in the provided scale.

Date 10 June 2021, in Brussels

*Miguel Alfonso Mendez*

..................................................................

*Opponent's signature*