

I. IDENTIFICATION DATA

Thesis title:	Metody zpracování signálu a predikce kolizních situací pomocí senzorických systémů založených na vláknových Braggovských mřížkách
Author's name:	Nesnidal Radek
Type of thesis :	master
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Electromagnetic Field
Thesis reviewer:	Carlos Guerra Yánez
Reviewer's department:	Department of Electromagnetic Field

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	extraordinarily challenging
<i>How demanding was the assigned project?</i>	
<p>The main goal of the project was to develop a prediction system for collapse-states in slopes. The experimental data for developing the system is not readily available online, which means that a part of the project includes designing an experiment that allows data collection for the design of the system. A summary of the expected goals for the assignment would be:</p> <ol style="list-style-type: none"> 1. Review and discussion of the fundamentals of FBG sensors. 2. Review and discussion of the processing techniques. 3. Experimental evaluation of slope behavior. 4. Proof-of-concept evaluation of a prediction system based on the experimental data. 	

Fulfilment of assignment	fulfilled
<i>How well does the thesis fulfil the assigned task? Have the primary goals been achieved? Which assigned tasks have been incompletely covered, and which parts of the thesis are overextended? Justify your answer.</i>	
<p>The experiment was performed successfully, and the data needed for the design of the system was collected. Multiple alternatives for the prediction system are presented in the document and a final decision to use an ANN-based predictor is achieved. All the expected goals mentioned before are fulfilled.</p>	

Activity and independence when creating final thesis	A - excellent.
<i>Assess whether the student had a positive approach, whether the time limits were met, whether the conception was regularly consulted and whether the student was well prepared for the consultations. Assess the student's ability to work independently.</i>	
<p>The student studied the state-of-the-art independently and the consultations were always focused and straightforward. The experiment and the data analysis were carried out on time.</p>	

Technical level	A - excellent.
<i>Is the thesis technically sound? How well did the student employ expertise in his/her field of study? Does the student explain clearly what he/she has done?</i>	
<p>The student introduces the necessary theoretical background in a precise manner. The experimental setup was described precisely, and the obtained results are sound. The use of error analysis methods in the discussion of the prediction system shows that the student has a satisfactory understanding of the field.</p>	

Formal level and language level, scope of thesis	A - excellent.
<i>Are formalisms and notations used properly? Is the thesis organized in a logical way? Is the thesis sufficiently extensive? Is the thesis well-presented? Is the language clear and understandable? Is the English satisfactory?</i>	
<p>The use of language is excellent. The structure of the work is reasonable and detailed enough. The use of terminology and notation is consistent throughout the thesis.</p>	

Selection of sources, citation correctness**A - excellent.**

Does the thesis make adequate reference to earlier work on the topic? Was the selection of sources adequate? Is the student's original work clearly distinguished from earlier work in the field? Do the bibliographic citations meet the standards?

The student references enough adequate sources (the field of landslide detection using optical sensors is not that big, and the 4 references selected on the topic are relevant). This work differs from previous approaches on the way the FBG sensors are used to detect the local strain in comparison to the use of inclinometers.

Additional commentary and evaluation (optional)

Comment on the overall quality of the thesis, its novelty and its impact on the field, its strengths and weaknesses, the utility of the solution that is presented, the theoretical/formal level, the student's skillfulness, etc.

This thesis is a first approach to the use of FBG networks in slope collision state detection. The obtained results are of excellent quality and have a novelty worth of an academic journal publication. The theoretical framework is adequately chosen, presented, and used in the thesis. The student has proved the ability to work independently and learn new skills.

III. OVERALL EVALUATION, QUESTIONS FOR THE PRESENTATION AND DEFENSE OF THE THESIS, SUGGESTED GRADE

Summarize your opinion on the thesis and explain your final grading.

The grade that I award for the thesis is **A - excellent**.

Date: **29.5.2024**

Signature:

