I. IDENTIFICATION DATA

Thesis name:	**Robust Visual Heart Rate Estimation**
Author's name:	**Radim Špetlík**
Type of thesis :	master
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Cybernetics
Thesis reviewer:	M.Sc. Janez Perš, Ph.D.
Reviewer's department:	Faculty of Electrical Engineering, University of Ljubljana, Slovenia

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	**challenging**

Evaluation of thesis difficulty of assignment.

The task was challenging, but doable. There is plenty of research done on this topic, but the student's aim was to do it properly, by taking into the account all possible factors that could influence the results, and try to mitigate them.

Satisfaction of assignment	**fulfilled**

Assess that handed thesis meets assignment. Present points of assignment that fell short or were extended. Try to assess importance, impact or cause of each shortcoming.

The target of the thesis is fulfilled. Based on the lessons from the related work, the student developed the methodology, acquired the additional dataset, and performed large set of experiments.

Method of conception	**correct**

Assess that student has chosen correct approach or solution methods.

The approach chosen by student (using deep learning to establish the relation between raw input data and the output labels) is correct and consistent with the state of the art.

Technical level	**A - excellent.**

Assess level of thesis specialty, use of knowledge gained by study and by expert literature, use of sources and data gained by experience.

The candidate analyzed large body of research literature in preparation for the thesis. He implemented state-of-the-art methods and used some innovative approaches to solve the problem of establishing the heart rate from video sequences (e.g. two stage CNN structure, one general, one dataset-specific). The student acquired a large database of videos that contain specific activities that are of interest when measuring the heart rate, and has proven that his approach works on his data as well as on the publicly available datasets.

Formal and language level, scope of thesis	**A - excellent.**

Assess correctness of usage of formal notation. Assess typographical and language arrangement of thesis.

Language is excellent and mathematical/symbolic notation is appropriate.

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

Present your opinion to student's activity when obtaining and using study materials for thesis creation. Characterize selection of sources. Assess that student used all relevant sources. Verify that all used elements are correctly distinguished from own results and thoughts. Assess that citation ethics has not been breached and that all bibliographic citations are complete and in accordance with citation convention and standards.

The student analyzed large body of scientific literature to get familiar both with previous work in this topic, as well as with the reasons why previously developed methods may be inappropriate or not robust. He used that knowledge in development of his methodology.

Additional commentary and evaluation

Present your opinion to achieved primary goals of thesis, e.g. level of theoretical results, level and functionality of technical or software conception, publication performance, experimental dexterity etc.

The level of achieved results is sufficient to write a decent scientific paper, therefore I judge the level of his achievement very high (given that this is the master thesis)

III. OVERALL EVALUATION, QUESTIONS FOR DEFENSE, CLASSIFICATION SUGGESTION

Summarize thesis aspects that swayed your final evaluation. Please present apt questions which student should answer during defense.

The level of the thesis is far above the average at our university, therefore I have no other option than to give grade A-excellent.

The question I propose the student answers at his defense:

- Given your results, would it be beneficial to employ lip tracker before Extractor network, and therefore put only image of the lips into your framework instead of the whole face?

I evaluate handed thesis with classification grade **A - excellent.**

Date: **12.6.2018**   Signature: