

I. IDENTIFICATION DATA

Thesis name:	Evaluation framework for infant 3D pose extraction from RGB images using RGB-D cameras and motion capture system
Author's name:	Noemi Vaculínová
Type of thesis :	bachelor
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Cybernetics
Thesis supervisor:	Doc. Mgr. Matej Hoffmann, Ph.D.; Valentin Marcel, Ph.D.
Supervisor's department:	Department of Cybernetics

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	extraordinarily challenging
<i>Evaluation of thesis difficulty of assignment.</i>	
The thesis assignment was highly challenging. It required abilities in multiple technical fields, from point-cloud processing, 3D pose extraction, RGB-D camera calibration and heterogeneous data fusion, rigid body mechanics, to ethics, experiment organization and management with infants. Dealing and mastering multiple software (Intel Realsense, Qualisys), and performing experiments with 2 very young infants of 3 and 8 months.	

Satisfaction of assignment	fulfilled
<i>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.</i>	
Overall, the assignment can be considered fulfilled. One point is partially covered: point-cloud alignment from RGB-D data with SMIL mesh model. The reason was the sudden change of the solution towards a full-marker set-up using sphere fitting to estimate 3D joint centers. Such solution was not required at the beginning of the thesis but quickly understood and performed by the student.	

Activity and independence when creating final thesis	A - excellent.
<i>Assess that student had positive approach, time limits were met, conception was regularly consulted and was well prepared for consultations. Assess student's ability to work independently.</i>	
The student managed to meet challenging tasks in an independent way, proposing adjustment to the current strategy and methods. A lot of tasks were laborious such as cleaning, filtering, labeling and filling motion capture trajectories. All these task were performed meticulously and always available quickly after the experiment.	

Technical level	A - excellent.
<i>Assess level of thesis specialty, use of knowledge gained by study and by expert literature, use of sources and data gained by experience.</i>	
The student has gained excellent competence in 3D human pose tracking, having worked from low level measurements with raw data to high level skeleton pose evaluation using and comparing different data sources (RGB-D, RGB, motion capture).	

Formal and language level, scope of thesis	B - very good.
<i>Assess correctness of usage of formal notation. Assess typographical and language arrangement</i>	

of thesis.

Formal notation and language level are very good and clear enough for a good understanding of the thesis.

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 managed to select and cite pertinent sources on all the different field of literature required.

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 student achieved the required goal and allowed the research team to advance further in both experimental and theoretical processes for extracting the 3D pose ground truth in infants. The report is a solid description of both research and experimental process that happened during the project and will be used as a basis for further extended work on the subject.

III. OVERALL EVALUATION, QUESTIONS FOR DEFENSE, CLASSIFICATION SUGGESTION

Summarize thesis aspects that swayed your final evaluation.

The results are not final – additional work will be needed to transform the motion capture data such that they can serve as reference values for quantitatively evaluating the accuracy of the movement trajectories extracted from video recordings (RGB).

However, this was beyond the scope of the assignment and the the student did an incredible amount of practical work, using what she has learned in several subjects, bringing the project further. There were many iterations of the experimental setups, recordings, processing, and interpretation of the results.

We evaluate the handed thesis with classification grade A - excellent.

Date: **7.6.2023**

Signature: