THESIS SUPERVISOR'S REPORT

I. IDENTIFICATION DATA

Thesis title:	**Personal Spatial Zones in Human-Robot Interaction Scenarios**
Author's name:	**Adam Rojík**
Type of thesis :	bachelor
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Cybernetics
Thesis reviewer:	Matej Hoffmann, Ph.D.
Reviewer's department:	Department of Cybernetics

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	**extraordinarily challenging**

How demanding was the assigned project?

The project was extraordinarily challenging as it involved working with two robots (Nao and Pepper), programming real-time behaviors in response to sensory information from robot and external sensors, including several software environments (NaoQi, ROS, YARP). In addition, experiments with approximately 100 participants were conducted and evaluated.

Fulfilment of assignment	**fulfilled**

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.

The assignment was fulfilled in all respects.

Activity and independence when creating final thesis	**A - excellent.**

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.

The student proved to be independent and proactive, overcoming a number of nontrivial issues. In some phases of the project (thesis writing), his time management could have been better and work consulted more regularly.

Technical level	**A - excellent.**

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?

The thesis is technically sound and the student had to employ expertise beyond his field of study.

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

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?

The thesis is very extensive and covers a lot of topics from different disciplines, which poses a challenge for a compact rigorous presentation. The student did his best to organize the thesis and largely succeeded, with a number of very useful schematics, cross-references etc.

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 conducted a study of the related work beyond the works recommended by the supervisors. Table 2.2 is a contribution in itself.

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.*

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

This is a truly excellent thesis in which the student had to master a number of robotics problems (using and bridging different middleware, camera-to-robot calibration, etc.) as well as learn a completely new domain of social robotics / human-robot interaction. He succeeded. There is already one publication from this thesis and two additional ones are planned.

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

Date: **8.1.2021**   Signature:

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Thesis reviewer:	Alessandra Sciutti, Ph.D.
Reviewer's department:	Italian Institute of Technology

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment   **extraordinarily challenging**

Evaluation of thesis difficulty of assignment.

The project entailed extremely challenging tasks, which require expertise in different domains, including the development of appropriate robot behavior for different robotic platforms, the experimental testing on a very large number of participants and the analysis of interaction data of different types (both questionnaire and behavioral data).

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 thesis addresses the research questions raised in a proper and detailed way.

Method of conception   **correct**

Assess that student has chosen correct approach or solution methods.

The student has conducted extensive experimental testing properly designed to address the research questions he focused on. Moreover, he improved the methods leveraging on the results of pilot tests.

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 student has shown the skill to properly elaborate the knowledge gained by literature review and the findings of his studies, to design and improve the methodology of research. Moreover, he exhibited an excellent skill in controlling the different robot platforms and different sensing included in the experiments.

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

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

The thesis is written in a clear language with proper notations. The structure could have been simplified, by opting for a more succinct presentation of the adopted methods. However, the descriptions are clear and the pictures are properly used to guide the reader's understanding.

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 thesis presents a very nice analysis of the state of the art, with a very useful tabular summary. The student clarifies well which elements of his research are inspired by previous literature and which elements are novel.

Additional commentary and evaluation

ČVUT
ČESKÉ VYSOKÉ
UČENÍ TECHNICKÉ
V PRAZE

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.

Please insert your commentary (voluntary evaluation).

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 thesis presents a very interesting line of research, with relevant results from a series of human-robot interaction experiments. It is noteworthy that, within the framework of a bachelor thesis, the student could complete both the setup of such complex tests – involving multiple robots, different software, a variety of sensors – and the experimental tests themselves, plus the data analysis. I also appreciated the rigor of the approach, where insights from pilot analysis were used to inform and correct the subsequent testing.

As a general question for the defense, I would ask to expand a bit more the commentary of the results of the analysis presented in the thesis (9.1.3 Distance assigned to each condition), to discuss what the different method of computing distances reveals.

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

Date: **25.1.2021**   Signature: