

## I. IDENTIFICATION DATA

<b>Thesis title:</b>	Map Management System for Visual Teach and Repeat Navigation
<b>Author's name:</b>	Vivek Punia
<b>Type of thesis :</b>	master
<b>Faculty/Institute:</b>	Faculty of Electrical Engineering (FEE)
<b>Department:</b>	Department of Cybernetics
<b>Thesis reviewer:</b>	Ing. Zdeněk Rozsypálek
<b>Reviewer's department:</b>	Department of Computer Science

## II. EVALUATION OF INDIVIDUAL CRITERIA

<b>Assignment</b>	<b>challenging</b>
<i>How demanding was the assigned project?</i>	
The thesis proposes creating a map management system for visual teach and repeat navigation. The assignment was challenging because it requires deep knowledge of existing frameworks, and it is necessary to do both research and engineering work to fulfil the assignment.	

<b>Fulfilment of assignment</b>	<b>fulfilled</b>
<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>	
The thesis fulfils all the individual requirements contained in the guidelines. From the engineering perspective, the student designed a database to store maps and created a distributed system to share the maps between robots in real-time. From the research perspective, the student proposes a parametric cost function to choose the most suitable map for the desired objective.	

<b>Activity and independence when creating final thesis</b>	<b>B - very good.</b>
<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>	
The student is very responsible and hard-working. He had no problems solving given sub-tasks, and he could come up with novel ideas. The only downside was that he sometimes needs close guidance, and I would appreciate more independence from the student.	

<b>Technical level</b>	<b>A - excellent.</b>
<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>	
The thesis is technically sound. It contains knowledge from multiple research and engineering fields, such as mapping, navigation and planning for mobile robots, computer vision, time-series analysis, and databases. The student proposes a method to improve the performance of a multi-robot system in a long-term deployment scenario and supports his claims with appropriate experiments.	

**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 well structured, easy to read and follow. All the presented concepts are clearly explained, and nicely done visualisations accompany them.

**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 review of the state-of-the-art is properly done. All the existing methods are correctly cited in the text. Citation 18 in the reference list incorrectly leads to arxiv as a source instead of the ICCV but that is only minor issue.

**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

*The thesis is well-written and engaging from both engineering and scientific point of view. It tackles the challenges of continual mapping for multi-robot systems during long-term, large-scale deployments. I assess the thesis as excellent because of the much work put into it and the broad knowledge necessary to fulfil the task.*

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

Date: 5.6.2023

Signature: