CTU CZECH TECHNICAL UNIVERSITY IN PRAGUE

THESIS SUPERVISOR'S REPORT

I. IDENTIFICATION DATA

Thesis title:	**Unsupervised learning of semantic landmarks for visual navigation over extended periods of time**
Author's name:	**Jan Blaha**
Type of thesis :	master
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Computer Science
Thesis reviewer:	George Broughton
Reviewer's department:	Department of Computer Science

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment — challenging

How demanding was the assigned project?

The project was challenging as the task was open. Some related papers were given, but otherwise the student had to come up with novel method themselves, investigate them, decide whether to persue the ideas, and evaluate then on a real data.

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.

It's clear that the student covered the related work well, and implemented the required methods from related work (including tuning parameters not explicitly mention in the paper). The student also proposed and implemented their own method's for this task. They then came up with an evaluation of the methods, performed it on the dataset, and on real robot data, and made a discussion about the results. Therefore I am satisfied with the fulfillment of the task.

Activity and independence when creating final thesis — A - excellen

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 had a proactive approach to the work, including regularly asking pertinent questions. This extends also for example to the robotic experiment, where they learned how to operate the robot and use ground-truth equipment independently of the supervisor. Testing the methods on a real robot to verify the results was certainly a very proactive step. The time management may have been better however, but generally the supervisor has no problems here.

Technical level — A - excellen

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 good. The student has reasonsed about their decisions, and how that has influenced their thought-process. The student clearly has taken in into account various assumptions, eg. for statistical methods, and how to mitigate their affects in the assessment process. The student evaluated the work on a dataset, including real-world considerations such as computational time, before going beyond and deploying on a real robot to verify the situation. The student has given a well reasoned conclusion of the work.

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Formal level and language level, scope of thesis	B - very go
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 formalisms are generally very good throughout. There are some minor issues (VT&RN not explained for example). There are also minor Latex (presumably) and formatting errors (Pg. 6 last paragraph "ImageNet" wrong latex formatting, graph axis labels are small. Figure 18 caption error.). The captions feel short - generally should explain whats going on. (eg. fig 5, especially with regards to how it is mentioned in the text), fig 2 and 3 have formulae unexplained – although these are coutesy images. Overall though these feel like small issues and generally the formalisms and language are good. The work is well organised and sufficiently extensive. The English is also good, but has problems in places. Overall these errors did not meaningfully affect the overall quality of the thesis.	

Selection of sources, citation correctness	A - excellen
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 related work generally covers the state of the art quite well, although I feel that some of important pieces should be there (eg. "Visual teach and repeat for long-range rover autonomy" by Furgale et al., "Monocular vision for mobile robot localization and autonomous navigation." Royer et al., where the student has made passing reference to other perhaps less relevant works by the author). The student's work is original and distinguished well. The bibliographic citations meet the standards.	

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.
No comment.

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 thesis is overall well laid out. The student was given a challenging task and explained the problem well. The student implemented a related method, and came up with their own ideas. They tested them on a dataset, and then tested them in a real-world robot experiment too to verify the results. I am satisfied with the work of the student.

The grade that I award for the thesis is A - excellen

Date: **7.6.2022** Signature: George Broughton