THESIS REVIEWER'S REPORT

I. IDENTIFICATION DATA

Thesis title:	**Mobile manipulation in Cluttered Environment**
Author's name:	Joonhong Min
Type of thesis :	master
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of measurements
Thesis reviewer:	Ing. Vojtech Vonasek, Ph.D.
Reviewer's department:	Department of cybernetics

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment   challenging

How demanding was the assigned project?

The task was to make a robotic system for manipulation with 3D objects. This task requires knowledge from several fields (planning, localization, 3D mapping etc.) that are all covered in master studies. However, the task requires to work with a bit unusual robots (Tiago + UR5 + Husky), which is novel for students. Therefore, I consider the topic of the thesis as a bit challenging.

Fulfilment of assignment   unfulfilled

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 guidelines have six points, but the sixth one is optional. However, only the first of the guidelines is fulfilled and covered in the thesis's text. Chapter five (pages 24 and 25) contains a note about 'state machine', but the method proposed on these pages cannot be considered as a full solution. Definitively this chapter does not contain any valuable state machine (note, that it is not even specified, what exactly the robot should do). Therefore, also the second point of the guidelines is not fulfilled. The guideline points 2-4 are not even mentioned in the thesis, and there is no dedicated chapter for them. Therefore, I consider them as unfulfilled. The author comments this in the Conclusion (Chapter 6) and admits that not all points are fulfilled.
It is worth saying that most of the guidelines are rather software-like (programming, definition of robot shapes/kinematics for ROS etc.) and they can be solved from home/home-office (regardless the Covid situation).

Methodology   incorrect

Comment on the correctness of the approach and/or the solution methods.As most of the guidelines are not fulfilled either discussed in the thesis, I can comment only on the methodology for the first point of the guidelines.

As most of the guidelines are not fulfilled either discussed in the thesis, I can comment only on the methodology for the first point of the guidelines. The student defined a new robotic system consisting of Husky/UR5 or Tiago robots. The system is described using a set of XML-like files (URDF, SDF formats) that is common in robotics. The thesis has three chapters about this topic (chapters 2,3, and 4), which is quite a lot, as these tasks are purely technical, and they do not deserve such ample space in the text. The description "how to connect/define robot in URDF" is too low-level and basic, so it should not be in the master thesis.
Other guidelines tasks were not even described. The text is missing and a high-level overview of the proposed system. It is, therefore, even hard to imagine what the student wanted to do.

Technical level   F - failed.

Is the thesis technically sound? How well did the student employ expertise in the field of his/her field of study? Does the student explain clearly what he/she has done?

The text contains mainly a description of XML-like files used in the ROS/GAZEBO (or similar) simulators to define the

shape/kinematics of the robots. The thesis lacks other technical information, and the text is, from this point of view, unsatisfactory for the master thesis. The work does not contain any images (screenshots) from the (even simulated) experiments, no measurements, no performance measures, which further indicates, that most of the guideline tasks were not fulfilled and even not implemented and tested.

Formal and language level, scope of thesis	F - failed.

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 text is written in English, and it contains numerous grammatical errors and misspellings. Verbs are often used in an incorrect form (active vs. passive). The text contains six chapters (introduction, four technical chapters, and conclusion), but the middle part (chapters 2-5) could be joined and shortened as they contain similar topics. Moreover, chapters 2-5 contain not such important information but rather technical details. Some sentences are tough to interpret, e.g., on page 24: " Move away from the table following the parallel path continuing from the approaching path" does not make sense. The text has different naming styles for Figures and even for the robots (e.g., „Tiago" vs. „tiago" (page 12)).
The text was not obviously treated by any spell/grammar checker neither corrected by the author. The text is definitively not acceptable for a master thesis.

Selection of sources, citation correctness	E - sufficient.

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?

As most of the tasks are not fulfilled, the text does not contain many references. There is not Related-work section (or similar). Several images (Fig. 2.3, 2.4, 2.6, 2.7, 3.1) are taken from other sources without proper citation.

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

Summarize your opinion on the thesis and explain your final grading. Pose questions that should be answered during the presentation and defense of the student's work.

As the student did not fulfill 4 out of 5 mandatory tasks, the thesis cannot be considered satisfactory for the master level. The thesis guidelines are, however, clear. In comparison to other masterworks from the department of cybernetics – the topic of the thesis is feasible. It can be fulfilled within the standard period.

The grade that I award for the thesis is | F - failed. |

Date: | 06/07/21 | Signature: