# Assessment of Masters' Thesis as a Supervisor

Title: **Mobile Manipulation in Cluttered Environment**
Author: **Joonhong Min**
Supervisor: **Dr. Gaël Écorchard**

## Fulfillment of Assigned Tasks

The assigned tasks were written so that the output is a control algorithm that can be used further for research work in the laboratory both on the simulated and the real robots. From the five mandatory assigned tasks, only the first one is presented in this thesis. The finite state machine was implemented but the presentation in the thesis is insufficient. The tasks did not require much theoretical background, as there was no requirements to develop new algorithm, but required a good technical understanding of the ROS ecosystem. Despite this, the study of the state of the art is practically absent from the work.

## Resolution Methods

One of the most important part of the work was the development of robot and environment models so that the same algorithm can be applied to both the real world and the simulated one. The pandemic situation complicated the possibility to check this on the real robot but this was not an impossible task, especially given the fact that the period for the work on this Masters' thesis was doubled. The low-level control of the robots with MoveIt! appear to be the same for the real and simulated robot, however, the high-level state machine contains some elements that make a differentiation between real and simulated robots, so that the simulation fails here to be a valid replacement of the real world.

## Obtained Results

The presentation of the results is lacking in the thesis, which does not contain a single number about the achievements. Joonhong showed me some simulated movements, so I would expect at least a few images of the simulated environment and a report about the success rate of the object picking over a few attempts. In the conclusion Joonhong mentions some failed attempts to drive the robots with MoveIt! Servo with reduced latency compared to the classical planning-base MoveIt!. This part of the work, even if not fully successful, should have been presented in the thesis as this would have allowed one to continue with this effort rather than starting from scratch.

## Practical Requirements

The thesis is generally well presented but it contains two figures that are not cited in the text, 3.1 and 5.1. It can be recognized that not enough time was dedicated to the writing of the thesis as there are a lot of grammatical mistakes, such as sentences without verbs and more generally wrong formulated sentences. Figures are of good quality. The bibliography is rather poor, both from the quantity and quality points of view, as most references are links to web pages of the different tool used.

## General Comments and Conclusion

In a general manner, the primary goals of the thesis are not achieved neither from the theoretical nor from the technical points of view. The range of the work is small with respect to the time spent under my supervision. This could have been compensated by the fact that Joonhong provided all his work in source-code form but it will be hard to find out what was tested and what worked at least partially since the source code is not accompanied by any introductory text. During his defense Joonhong should present some simulation results and some details about the develop state machine.

As a conclusion, I advise the commission to evaluate the presented Masters' thesis with the grade

**E - Sufficient**.

Prague, June 8, 2021                                                        Dr. Gaël Écorchard
                                                                                    ČVUT, CIIRC