

## Supervisors review of bachelor thesis

Title: Autonomous Driving with the help of a web camera

Author: STEVE SUNIL MATHEWS

The goals of this bachelor thesis were to select and test suitable methods for autonomous driving of a small car model with a web camera.

The student had to first study what kind of sensors are suitable for autonomous cars, what are their advantages and limitations. He then had to study programming. As a programming language, Python was chosen, since it has good libraries for image recognition. The student had to learn working with the language and using OpenCV libraries. The goal of the thesis was not to develop own image recognition algorithms, but use the existing ones in an application.

It was obvious from the start that the software will run on a PC, since there is not enough space on the car model for a computer that is fast enough for image processing. The student had tested several algorithms. The testing was done on images and videos from the internet, and on his own images and videos.

As the school labs were closed since March 2020, the original idea of placing the camera on the car model in the labs had to be abandoned. Instead, the student tested the algorithms on videos taken from a car in traffic in Prague. The goal was to detect the obstacles, such as other cars, pedestrians etc. and get their coordinates in the image. The coordinates can then be sent to the control system of the car to take necessary actions, such as avoid them or brake.

The thesis will serve as a base for further theses.

During the work on the thesis, the student had to learn Python programming and basics of image processing and recognition, which he had no previous knowledge before.

The student had worked on the thesis regularly, presenting his advances on approximately weekly meetings. He showed a steady regular progress in his work.

I recommend the thesis for presentation and grade it with grade "A - excellent.

Doc. Ing. Martin Novák Ph.D.

Department of Instrumentation and Control Engineering