Self driving toy car

Project for 3D Computer Vision lecture, summer term 2020

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***Abstract*—This report describes the self driving car toy project done in the 3D Computer Vision lecture at Heidelberg University. The goal is to train neural networks so that the given car can drive autonomously on a track.**

***Index Terms*—computer vision, autonomous driving, neural networks**

I. Getting started

For getting started an operating system needs to be flashed onto the Raspberry Pi 3 B+ which is mounted into the car. Through the Raspberry Pi Imager the Pi OS 32-bit in release 2020-05-27 was flashed onto the SD card. The OS is a port of Debian with the Raspberry Pi Desktop and comes with an integrated configurator to enable SSH, VNC, the camera, SPI and I2C. To start we follow two different approaches. The first approach uses OpenCV for classical image processing. The second one is using machine learning algorithms.

II. OpenCV

OpenCV is an open computer vision library. Controller Arduino PCA9685

A. Evaluation

III. Conclusion

References

References

[1] M. Abadi et al. "Tensorflow: Large-scale machine learning on heterogeneous distributed systems," arXiv preprint, 2016.