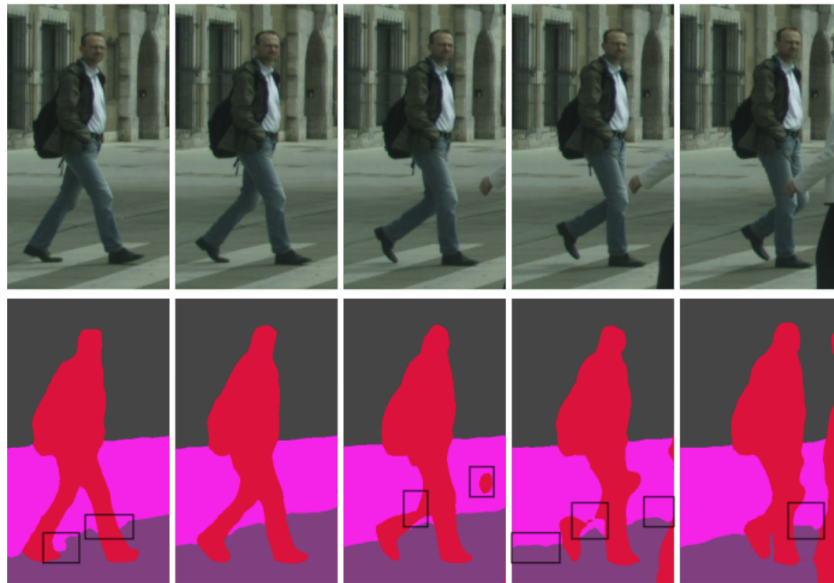


Master Thesis

Semantic Segmentation of Video Sequences



Semantic Segmentation of a video sequence, example taken from [1]

In the last years, convolutional neural networks (CNNs) have proven to excel on multiple computer vision tasks including image classification, object detection and semantic segmentation. They are a powerful tool to teach autonomous cars the capability to understand their complex and dynamic surroundings. There are many different applications for deep learning in autonomous driving and adjusting the network architectures to the task at hand is an exciting field of research.

In this thesis, a novel neural network architecture is to be designed which uses a sequence of input images for semantic segmentation. The proposed architecture should overcome a single image segmentation by using the temporal information given by the image sequence. In order to achieve this, different approaches shall be evaluated regarding computational cost and classification accuracy. This might include the use of recurrent neural networks, 3D convolutions, optical flow and a post-processing of the single image segmentation.

If you are interested, please write an email to the contact below with your CV, transcripts and a description of your coding experiences.

- Requirements: Theoretical knowledge in machine learning, deep learning & statistics
 Experienced in python and at least one deep learning framework
- Topics: Deep Learning, Computer Vision, Autonomous Driving
- Supervisor: M.Sc. Frank Bieder
 Institute of Measurement and Control Systems (MRT)
 Email: frank.bieder@kit.edu, phone: Tel.: +49-721-608-48423
- Start Date: September, October or November 2019

[1] Andreas Pfeuffer et al: *Semantic Segmentation of Video Sequences with Convolutional LSTMs*, ArXiv 2019