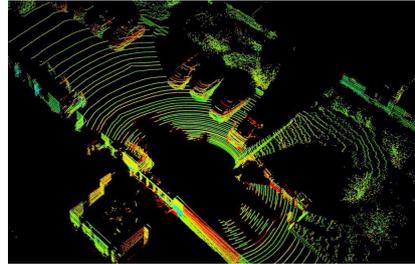


Bachelor Thesis / Master Thesis (Deep Learning)

Interested in **deep learning**, **computer vision** and **autonomous driving**?
Looking for a bachelor/master thesis to conduct research on cutting-edge technologies? Find out more in the proposal below or contact me directly to discuss further topics!



Vision with semantic segmentation [1]



LiDAR measurement [2]

Representation Learning for Autonomous Driving

In the last years, convolutional neural networks (CNNs) have been 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 the given project, a movable agent shall be taught to localize itself within a given high definition map using deep learning methods. The thesis aims to develop a CNN architecture which is able to extract the relevant information from an agent's perception, especially camera and LiDAR information. Designing the learned representation space and the corresponding CNN architecture is the main objective of the proposed thesis.

It consists of the following parts:

- Literature research about deep learning, especially representation learning
- Literature research about available datasets
- Definition of required labels including processing of available datasets or recording of new data
- Design and implementation of novel deep learning architectures
- Evaluation of the developed algorithms on state-of-the-art benchmarks

I am happy to answer any questions you might have. Feel free to ask for an appointment or just drop by at my office!

[1] www.cityscapes-dataset.com

[2] <https://www.mrt.kit.edu/res2.php>

**Institute of Measurement
and Control Systems (MRT)**
Prof. Dr.-Ing. Christoph Stiller

Advisor:

Frank Bieder, M.Sc.

Programming language(s)¹:

Python proficient
C++ advanced

System, Framework(s):

Linux

Required skills:

- Prior knowledge of deep learning & computer vision
- Excellent coding skills
- Work on your own

Language(s):

German or English

For more information please contact:

Frank Bieder

Room: 237 → just drop by!

Phone: +49 721 608-48423

Email: frank.bieder@kit.edu

Or directly send in your application including your current grades as well as our questionnaire!

