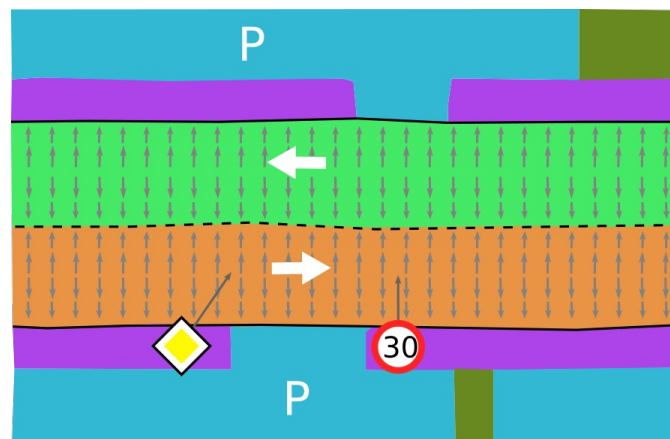


Master's thesis: Grid Map Encoding of HD Maps for Deep Learning Tasks

Most self-driving cars rely on high definition (HD) maps for behavior generation and planning. These HD maps contain centimeter-accurate annotations of lane geometries as well as lane topology and traffic rules.

These maps are very costly to create and maintain. We therefore do not rely on manually annotated HD maps but infer the information online from sensor data using deep neural networks.

The typical structure of HD maps, however, is incompatible with neural networks: HD maps consist of poly-lines with attributes, identifiers, and more. Deep neural networks are usually bad at predicting these data structures directly, but they are good at making predictions on grid maps.



The goal of this thesis is to find grid map encodings of HD maps that are suitable for deep neural networks. These can e. g. contain vector fields pointing towards the lane boundaries.

You will implement two-way conversions between a provided HD map and your proposed encodings. You will then evaluate these encodings in terms of information loss during conversion, computational efficiency, and suitability for neural network inference.

The thesis will be supervised by the MRT (contact person Dr. Martin Lauer) and the KIT/FZI spinoff SafeAD (supervisor Dr. Niels Ole Salscheider).

If you are interested in this thesis proposal please apply with a recent transcript at jobs@safead.de.