In automated driving cameras are one of most important sensors alongside lidar and radar. In comparison to the latter, they can provide a dense environmental representation. In order to cover the full surroundings of the ego-vehicle, multiple cameras are needed. To improve following perception tasks like object detection, sensor data can be fused together in image space. Combining several images taken from different positions and angles to a surround view is called image stitching.

The topic of this thesis is the development of an image stitching framework using machine learning. For this purpose, the input data consists out of synchronized camera images and its calibration. The output of the network results in a $360^\circ$ surround view. In order to achieve this, a convolutional neural network architecture should be implemented using TensorFlow. Afterwards, the network architecture needs to be evaluated on state-of-the-art datasets. Finally, a qualitative evaluation is also possible on data, which was recorded by our experimental vehicles at MRT.

The proposed thesis consists of the following parts:

+ Literature research about image stitching and different machine learning approaches
+ Implementation in TensorFlow
+ Training and Evaluation on pre-existing datasets

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