



## Master Thesis (6M)

In collaboration with Bosch

Thesis title	Improving Object Detection Performance of Automotive Radar by Deeply Reinforced Cognitive Sensing
Thesis description	<p>Radar sensing for autonomous vehicles must provide robust object detection performance in every scenario. This research aims to address the challenges of detecting weak targets and vulnerable road users at long distances and in complex object constellations, overcoming the limitations of current static sensor modulations.</p> <ul style="list-style-type: none"> <li>• During your master thesis, you will implement cognitive sensing to adapt the sensor modulation based on sensor results and their uncertainties to optimize radar object detection capabilities.</li> <li>• You will extend the existing online radar simulation framework to create a closed-loop pipeline for reinforcement learning.</li> <li>• You will also train a reinforcement learning agent to optimize sensor modulation parameters under different conditions and driving scenarios.</li> <li>• You will perform regression tests and ablation studies to evaluate the performance of the approach.</li> <li>• Finally, you will benchmark the cognitive sensing approach against baseline methods in different use cases.</li> </ul>
Qualifications	<ul style="list-style-type: none"> <li>• Profound knowledge of machine learning and radar technologies</li> <li>• Coding experience in Python and deep learning frameworks, ideally PyTorch</li> <li>• Independent, systematic working style with analytical thinking</li> </ul>
Begin	According to agreement
Duration	6M for Master thesis
Language	English
Supervisor	Bosch + ISS

Please contact Prof. Bin Yang ([bin.yang@iss.uni-stuttgart.de](mailto:bin.yang@iss.uni-stuttgart.de)) by email together with your Master transcript.

28.08.2024