TUΠ

Master's Thesis

Uncertainty Propagation in Camera-based Perception of Autonomous Vehicles

Scenario simulations are a promising approach to detect limitations of HAD systems.Simulations are a viable means of verifying the decision-making capabilities of HAD vehicles in a multitude of situations. In particular, simulations can verify the behavior of the
system in rare but otherwise critical situations that are either too complex or too dangerous to reproduce in
the real world. Using simulations in combination with a formalization of safety goals enables search-based
testing to automatically identify scenarios in which the perception system cannot meet safety goals due to sensor, system architecture, or environmental limitations. Critical scenarios could be used to identify perceived uncertainty and how it propagates through-out the system architecture.This thesis investigates such simulation-based approach for a camera-based perception model of HAD vehicles, and proposes a scheme to validate the developed perception model.

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