Forschungspraxis

Comparison of Safety Guarantee Mechanisms for LCTs

This thesis compares safety implementations for LCTs and decisively determines the superior one through simulations. The aim is to identify the safety mechanism with the best performance without violating any constraints. To achieve this, different approaches (shielding, forbidden classifier) have to be implemented in MATLAB and good settings have to be found for each implementation.

The project is divided into two phases.

To accomplish our objective, we will implement different approaches, such as the Forbidden Classifier, Preemptive Shielding, and Post-posed Shield. We will compare these implementations with the archive we already have. Throughout the implementation process, we will determine several properties, including how to build the forbidden classifier table, how to build the shield (i.e., what actions should be valid), and how to set the reward for the post-posed shield. Optimizing performance may require fine-tuning.

After completing the simulation phase in Matlab, we will make a decision on whether to implement the approach in hardware or test it in our Duckietown environment.

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