Type: Minisymposium Contribution

Probability-Based Collision Risk Evaluation of Trajectories for Optimal Control Problems with Moving Obstacles

Thursday, August 15, 2024 12:00 PM (30 minutes)

We utilize the probability distributions of the future location of moving obstacles to aid in the maneuver planning of autonomous vehicles. The result is an objective function and necessary derivatives to solve optimal control problems in a multi-shooting scheme with shooting nodes on an equidistant time grid. We evaluate the proposed objective function in different scenarios featuring obstacles governed by a single-track kinematic model. The probability distributions of an obstacle's future location are given for each time step by a probability mass function on a location grid. From these likelihoods, we derive a risk map that allows a convenient treatment of multiple obstacles and serves as the basis of the objective function.

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