Embedded Optimization for Automotive Applications

Motivation

In the automotive industry, control problem statements can be addressed using optimization-based strategies, which are powerful techniques for achieving specific control objectives while considering the system's dynamics and constraints. However, solving optimization problems in real-time applications requires a significant amount of computational power, which can limit the use of optimization-based control strategies on resource-constrained hardware, such as automotive control units.

The idea is to investigate and exploit certain properties of the underlying dynamic system to reduce the problem's complexity without relevant loss of accuracy. The method is developed and investigated based on the control allocation problem in an over-actuated vehicle.