Minimum-Time Speed Optimization Along a Fixed Path

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- Paper
- MTSOS (efficient software for solving speed optimization problems)

In this paper we investigate the problem of optimizing the speed of a vehicle over a fixed path for minimum time traversal. We utilize a change of variables that has been known since the 1980s, although the resulting convexity of the problem was not noted until recently. The contributions of this paper are three fold. First, we extend the convexification of the problem to a more general framework. Second, we identify a wide range of vehicle models which can be included in this expanded framework. Third, we develop and implement an algorithm that allows these problems to be solved in real time, on embedded systems, with a high degree of accuracy.