Multi Objective Near-Optimal Trajectory Planning of Mobile Robot

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Abstract : This paper presents the optimal control problem of mobile robot motion as a nonlinear programming problem (NLP) and solved using a direct method of numerical optimal control. The NLP is initialized with a B-Spline for which node locations are optimized using a genetic search. The system acceleration inputs and sampling periods are considered as optimization variables. Different scenarios with different objectives weights are implemented and investigated. Interesting results are found in terms of complying with the expected behavior of a mobile robot system and time-energy minimization.