

Model Predictive Control (MPC) and Proportional-Integral-Derivative (PID) Control of Quadcopters: A Comparative Analysis

Authors : Anel Hasić, Naser Prljača

Abstract : In the domain of autonomous or piloted flights, the accurate control of quadrotor trajectories is of paramount significance for large numbers of tasks. These adaptable aerial platforms find applications that span from high-precision aerial photography and surveillance to demanding search and rescue missions. Among the fundamental challenges confronting quadrotor operation is the demand for accurate following of desired flight paths. To address this control challenge, among others, two celebrated well-established control strategies have emerged as noteworthy contenders: Model Predictive Control (MPC) and Proportional-Integral-Derivative (PID) control. In this work, we focus on the extensive examination of MPC and PID control techniques by using comprehensive simulation studies in MATLAB/Simulink. Intensive simulation results demonstrate the performance of the studied control algorithms.

Keywords : MATLAB, MPC, PID, quadcopter, simulink

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