

Collision Avoidance Based on Model Predictive Control for Nonlinear Octocopter Model

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Abstract : The controller of the octocopter is mostly based on the PID controller. For complex maneuvers, PID controllers have limited performance capability like in collision avoidance. When an octocopter needs avoidance from an obstacle, it must instantly show an agile maneuver. Also, this kind of maneuver is affected severely by the nonlinear characteristic of octocopter. When these kinds of limitations are considered, the situation is highly challenging for the PID controller. In the proposed study, these challenges are tried to minimize by using the model predictive controller (MPC) for collision avoidance with a nonlinear octocopter model. The aim is to show that MPC-based collision avoidance has the capability to deal with fast varying conditions in case of obstacle detection and diminish the nonlinear effects of octocopter with varying disturbances.

Keywords : model predictive control, nonlinear octocopter model, collision avoidance, obstacle detection

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