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AN IMPROVED REENTRY TRAJECTORY OPTIMIZATION METHOD FOR MULTIPLE NO-FLY ZONES AND WAYPOINTS

Abstract

Convex optimization has shown its unique theoretical advantages in high lift-to-drag ratio reentry vehicle gliding trajectory planning in recent years. The limitation that still exists in this method, however, involves in multiple no-fly zones or waypoints constraint. It is difficult to guarantee convergence and physical reality in some cases. This paper describes improvements based on an energy management method which be able to enhance the lateral maneuverability and overcome previous problem. In order to apply convex optimization, discretization and relaxation methodology are used to convert trajectory planning into a second-order cone programming (SOCP) which could be solved by modern tools. According to energy management result, trajectory is divided into several phases and solved independently. Simulation results are presented to demonstrate the performance of the developed algorithm.