Optimal H_∞ Design of Conventional Control Systems

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Abstract. The aim of the paper is to present a design method of a control system with PID (Proportional-Integral-Derivative) structure based on an H_∞ norm minimization technique. It is shown that the necessary and sufficient solvability conditions of the optimal control problem are equivalent with the feasibility of a system of bilinear matrix inequalities. A numerical algorithm to solve this system is proposed.

The theoretical developments are illustrated by a case study concerning the automatic flight control system design of a launch vehicle.