Refined H∞-Optimal Approach to Rotorcraft Flight Control

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Abstract

This paper introduces an approach to refine the H∞-optimal controller for the four-block H∞ control problem. The second singular value of the compensated system can be analyzed and synthesized with a free parameter by the proposed approach. This approach is implementable in computation with an appropriate selection of a diagonalizing matrix pair. The H∞ norm of the sublayers can, therefore, be improved. The characterization of the sublayers for the four-block problem is also completed. The problems that required higher robustness are suggested by this proposed approach. Furthermore, an engineering application concerning the rotorcraft flight control is provided. The simulation results bestow a promising progress both in the frequency domain and in the time domain. The gain margin, phase margin, settling time, and damping effect are improved in this example.