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Parameterized Lyapunov Function Based Robust Diagonal Dominance Pre-Compensator Design for Linear Parameter Varying Model

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Abstract : For dynamic decoupling of linear parameter varying system, a robust dominance pre-compensator design method is given. The parameterized pre-compensator design problem is converted into optimal problem constrained with parameterized linear matrix inequalities (PLMI); To solve this problem, firstly, this optimization problem is equivalently transformed into a new form with elimination of coupling relationship between parameterized Lyapunov function (PLF) and pre-compensator. Then the problem was reduced to a normal convex optimization problem with normal linear matrix inequalities (LMI) constraints on a newly constructed convex polyhedron. Moreover, a parameter scheduling pre-compensator was achieved, which satisfies robust performance and decoupling performances. Finally, the feasibility and validity of the robust diagonal dominance pre-compensator design method are verified by the numerical simulation of a turbofan engine PLPV model.

Keywords : linear parameter varying (LPV), parameterized Lyapunov function (PLF), linear matrix inequalities (LMI), diagonal dominance pre-compensator
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