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Robust nonlinear real-time control strategy to stabilize a PVTOL aircraft in crosswind

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ABSTRACT

A robust control strategy to stabilize a PVTOL aircraft in the presence of crosswind is proposed in this paper. The approach makes use of Robust Control Lyapunov Functions (RCLF) and Sontag's universal stabilizing feedback. A nonlinear dynamic model of the aircraft taking account the crosswind has been developed. Likewise, a robust nonlinear control strategy is proposed to stabilize the PVTOL aircraft using RCLF, and we have employed the Riccati equation's parameters to compute and tune it in real-time. To validate the proposed control strategy, various simulations have been carried out. The controller has been also applied in real-time to a PVTOL prototype undergoing crosswinds. The experimental results show the good performance of the control algorithm.

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