

عنوان مقاله:

Design and Comparison of MPC and LQR Control Methods for a Passenger Aircraft

محل انتشار:

بیست و یکمین کنفرانس بین المللی انجمن هوا فضا ایران (سال: 1401)

تعداد صفحات اصل مقاله: 6

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خلاصه مقاله:

The paper compares the performance of two altitude controllers, MPC and LQR, for aircraft in cruise flight conditions. The design of the controllers is based on the linearized state space matrix of the aircraft's longitudinal motion around the trim conditions. The controllers' ability to track the desired altitude while satisfying input and state constraints is evaluated, and it is found that both controllers are effective in maintaining the desired altitude. However, the MPC controller outperforms the LQR controller in terms of limited control input, achieving smoother and more efficient control input by predicting the future behavior of the system. The proposed altitude controllers provide a promising solution for maintaining the desired altitude of aircraft in cruise flight conditions, and the comparative analysis of the two control methods can assist in the selection of the appropriate control strategy for a given aircraft system based on the desired performance requirements.

کلمات کلیدی:

MPC, LQR, Fixed-wing, Aircraft, Altitude control

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