

## **Robust Model Predictive Controller for Uncertain Nonlinear Wheeled Inverted Pendulum Systems: A Tube-Based Approach**

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**Abstract :** This work presents the problem of tube-based robust model predictive controller for a class of continuous-time systems in the presence of input disturbances. The main objective is to point out the state trajectory of closed system being maintained inside a sequence of tubes. An estimation of attraction region of the closed system is pointed out based on input state stability (ISS) theory and linearized model in each time interval. The theoretical analysis and simulation results demonstrate the performance of the proposed algorithm for a wheeled inverted pendulum system.

**Keywords :** input state stability (ISS), tube-based robust MPC, continuous-time nonlinear systems, wheeled inverted pendulum

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