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Trajectory Tracking Controller Based on Normalized Right Coprime Factorization Technique for the Ball and Plate System

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Abstract : This paper presents the development of a double-loop trajectory-tracking controller for the ball and plate system (BPS) using the Normalized Right Coprime Factorization (NRCF) scheme.The Linear Algebraic (LA) method is used to design the inner loop required to stabilize the ball, while H-infinity NRCF method, that involved the lead-lag compensator design approach, is used to develop the outer loop that controls the plate. Simulation results show that the plate was stabilized at 0.2989 seconds and the ball was able to settle after 0.9646 seconds, with a trajectory tracking error of 0.0036. This shows that the controller has good adaptability and robustness.

Keywords : ball and plate system, normalized right coprime factorization, linear algebraic method, compensator, controller, tracking.
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