DESIGN OF SLIDING-PID CONTROL SYSTEM FOR DOUBLE PENDULUM ON MOVING CART

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Abstract

Most systems that exist in the real world are nonlinear systems so that are difficult to control. Double pendulum is a system that simulates a control mechanism to regulate the stability problem. The main problem in control system design for the double pendulum is to stabilize the pendulum rod in equilibrium by moving train on limited trajectory.

In this research, Sliding-PID control system is designed to stabilize the double pendulum. Sliding-PID controller is a combination of PID controller and Sliding Mode Controller. Double pendulum system is modeled by using Matlab Simulink based on the equations of kinematics and dynamics.

The results of the implementation of Sliding-PID control system on the simulation shows that Sliding-PID controller able to make the double pendulum on moving cart achieves its stability 43.42% faster than classical PID controller.

Keywords: double pendulum, PID controller, Sliding-PID.
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