ACTUATOR AND CONTROLLER DESIGN FOR THE INVERTED PENDULUM ON A CART DRIVEN BY A BELTING SYSTEM

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ABSTRACT

The inverted pendulum is one example of an unstable system and is a classical problem in control theory. Many different approaches in construction and control methodologies have been studied by different researchers in order to solve this problem. The main objective is to keep the inverted pendulum in the vertical position i.e. in the balanced condition. In this project, a single inverted pendulum on a cart is balanced by moving the cart forward and backward using a pulley-belt transmission system. The plant parameters are obtained experimentally in the laboratory. A suitable actuator has been chosen to drive the cart. The state-space pole-placement technique controller has been designed, to balance the inverted pendulum. Simulation results show that the inverted pendulum can be balanced.

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