

Investigation of classical and fuzzy controller robustness for gantry crane system incorporating payload

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ABSTRACT

This paper presents theoretical investigations into the dynamic characterisation of a two dimensional gantry crane system incorporating payload. A dynamic model of the system is developed using Euler-Langrange formulation. Simulation exercises are performed in Matlab with two different control strategies, PD and PD-Fuzzy controllers. To study the effects of payload weight on the response of the gantry crane system, the sway angle movement of the rope and its respective power spectral density are evaluated with different payload weight being placed at the end of the rope. Simulation results are presented in time and frequency domains. The robustness of the classical and fuzzy controllers in minimizing the sway angle is examined in terms of time response specifications and the results are then discussed in details.

KEYWORDS:

Gantry crane system; PD controller; PD-FLC controller

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