MODELING AND CONTROLLER DESIGN OF ROBOTIC MANIPULATOR

MOHD FIRDAUS BIN RAHIM

(2007269286)

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"I declared that this thesis is the results of my own work except the ideas and summaries which I have clarified their sources. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any degree."

Signed: ....

Date : ..17/5/2010..

Mohd Firdaus Bin Rahim
UiTM No : 2007269286

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ABSTRACT

A robot manipulator also known as robotic arm usually programmable with similar function to a human arm. A manipulator is composed of links, joints and drive components. The degree-of-freedom (DOF) of a robotic manipulator can be defined as the direction in which a robot moves when a joint is actuated. Usually each joint represents one degree of freedom. This project was undertaken to study how to develop a mathematical model for robotic manipulators and equipped with controller. First of all, the two-link manipulator is a simple; the 2-DOF mechanism that incorporates a large amount of complexity in its dynamics. Therefore, based on theory by using Newton-Euler method of mathematical modeling are investigated. Mathematical model is developed base on a 2-DOF manipulator. The mathematical model is tested and the controller is designed by using engineering software i.e. MATLAB Simulink. The physical behavior and the controller are investigated based on an angle control so that the manipulator can provide the ideal rotation with properly to improve the response of the system.

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