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2019 7th International Conference on Mechatronics Engineering, ICOM 2019
October 2019, Article number 8952036
7th International Conference on Mechatronics Engineering, ICOM 2019; Putrajaya; Malaysia; 30 October
2019 through 31 October 2019; Category numberCFP1951N-ART; Code 156771

Analysis of Point-to-Point Robotic Arm Control using PID controller (Conference Paper)

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Abstract

Point-to-point robotic arm has been used in manufacturing industry to assist company in increasing its production rate. However, the biggest concern in robotic arm is the accuracy for the robot to complete the task of pick-and-place of an object which is dependent on the designed controller. This study investigates the accuracy of the 5 degrees of freedom (DOF) robotic arm model with PID controller. The forward kinematic is analysed systematically in order to determine the required movements for each of the robotic arm joint for its desired operations. The objective of this paper is to simulate the movements of the robotic arm with and without controller by utilizing MATLAB GUI, a microcontroller and servo motors in order to demonstrate the effectiveness of the system. Performance comparison of the robotic arm in completing the pick-and-place task with and without PID is presented in this paper. The preliminary results showed that the difference errors between the desired angular displacement of with and without controller are 0.65%, 3.61%, 10.74%, 82.18% and 44.44% for the five movements. © 2019 IEEE.

SciVal Topic Prominence ⓘ

Topic: Robotics | Robotic arms | Twisted string

Prominence percentile: 96.174 ⓘ

Author keywords

kinematics analysis MATLAB PID controller Robotic arm

Indexed keywords

Engineering controlled terms:

Controllers Degrees of freedom (mechanics) Electric control equipment Kinematics
Manufacture MATLAB Proportional control systems Robotic arms
Three term control systems

Engineering uncontrolled terms

Angular displacement Forward kinematics Kinematics analysis Manufacturing industries
Performance comparison PID controllers Point to point Production rates

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Robotics

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ISBN: 978-172812971-6
Source Type: Conference Proceeding
Original language: English

DOI: 10.1109/ICOM47790.2019.8952036
Document Type: Conference Paper
Sponsors: Inspilogix, ProStram Technologies
Publisher: Institute of Electrical and Electronics Engineers Inc.

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