

Empirical Correlation of Consistency and Time of Trajectory for Industrial Robots

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Abstract

This research is devoted to develop an empirical correlation mathematical based for consistency and time of a robotized industrial task simulating an automated manufacturing work-cell such as the robotic leaser cutting using an educational robotics test-cell. The correlation is to investigate contributions of the impact parameters on the performance of robotized work-cell. Processing time models the cycle time and quality of the task has been modeled in terms the consistency of outline. A set of mathematical formulas have been used to simulate the consistency and cycle time in order to tackle the variability of proposed sources as pieces of time and dimensions that need to be processed in the loaded parts the work-cell; in addition the relationship that suggestively correlates the impacts. A set of experimental tests has been conducted responding to the predicted formulas for the cycle time and consistency. Experimentation factors that have been leveled from minimal to maximal values are selected based on the robot's computer operating system in terms of processing speed, motion properties, and termination types the default characters of the programming. Analysis the results shows that the correlation can be used to tradeoff the programming solutions objectively depending on the task design requirements. The contribution of this research work is to introduce a new depiction of optimizable factors of robotic computer programs that directly affect the performance criteria.

Biographies

Hayder Zghair is a Faculty in the Department of Industrial and Manufacturing Engineering Department at Kettering University, Michigan, USA. Mr. Zghair earned B.Sc. in Production Engineering from University of Technology, Baghdad; and two M.Sc. degrees. The first Master has been earned in Production Engineering from University of Technology, Baghdad, Iraq. The second Master was in Manufacturing Systems Engineering from Lawrence Technological University, Michigan, USA. Currently, Mr. Zghair is PhD candidate in Manufacturing Systems Engineering at Lawrence Technological University, Michigan, USA. He has published journal and

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