SIMULATION AND OPTIMIZATION OF PICK AND PLACE ROBOT OPERATION

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A thesis submitted in partial fulfillment of the requirement for award of Bachelor of Engineering (Hons.) in Mechanical Engineering.

BACHELOR ENGINEERING (HONS) (MECHANICAL)

UNIVERSITI TEKNOLOGI MARA (UiTM)

MAY 2010

ACKNOWLEDGEMENT

First and foremost, Alhamdulillah and thanks to Allah the Almighty for the completion of this thesis. I am eternally grateful for the support and encouragement from my family. Since a day I entered higher education institution, my family has always inspired and motivated me beyond mere academic mediocrity. During past year and the half, the support continued and encourages me more hardworking and tough in completing my project. The satisfaction of completing this project would have been meaningless without having my family support throughout the entire process.

I also indebt to Assoc. Prof. Dr. Ir. Hj. Muhammad Azmi bin Ayub as my project advisor for his valuable time, guidance, encouragements and advises in making of this thesis. Furthermore to some of my fellow friends who helped and supported me as well not only trusting in accomplishing this project also rather skilled by using the CATIA application.

Last but not least, I would like to express my gratitude to other people who are help and support directly or indirectly for completion of this thesis. Thank you.

ABSTRACT

Robots are heavily used in the manufacturing industry. A robot can take a medial task done by an operator and maximize productivity by working in minimal time with maximum results [2]. This means that any mechanical failure of the robot system can result in many hours of lost production or can generate large amounts of scrap parts. The joint failure is one of the cause of robot cannot operate properly and whole operation stop. The joint failures occur due to extreme angle of movement at one or two particular joint. Therefore, preventive maintenance is important thing in order to reduce probability of robot failure during operation time. In this project, pick and place operation is used as a sample of robot operation to analyze robot's angle of movement at each joints and its cycle time. The SCORBOT ER-5 Plus robot has been used as a model in this project. Within this project, operation pick and place of the SCORBOT ER-5 Plus robot is simulated using CATIA V5 R17 DMU Kinematics at different location of workcell in order to get its cycle time and displacement angle. The result of simulation result had been analyzed to get angle of movement at each joint of robot and it cycle time. To accomplished this project result has being recorded and tabled. In conclusion, all the gathering result had been analyzed and proposes the best location for place the robot in order to get even distribution movement at each joint and the shortest cycle time for each operation that can improve robot preventive maintenance and optimize it operation time.

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