OPTIMIZING DELTA ARM ROBOT BY IMPLEMENTING ROBOT OPERATING SYSTEM – INDUSTRIAL (ROS-I) AND VISION-SYSTEM

By

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STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.

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ABSTRACT

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The main purpose of this thesis is to implement Robot Operating System – Industrial (ROS-I) into the existing SGU's Delta Arm Robot. The ROS-I was used due to its emphasis of code reutilization and based on ROS which provides vast package library for robotics applications. The implementation consists of two main subsystems vision-system and robot movement which at the end create the whole structure of Delta Arm Robot to perform simple pick and place task. The vision-system was used to perform object detection and sent the appropriate coordinate information from the detected object into the robot movement system. In the robot movement system, then the information will be processed to manipulate the Delta Arm Robot. Existing hardware from the robot such as Dynamixel servo, conveyor belt, and the Delta Arm Robot parts were used in order to create those two subsystems. Additionally, new rotary end-effector and mechanical gripper were made for future development of the Delta Arm Robot. At the end, the result of this thesis was a system that can perform a simple pick and place task and indirectly improve the Delta Arm Robot from the existing one.

Keywords: ROS-I, Delta Arm Robot, Vision System, End-Effector, Pick and Place, Dynamixel

DEDICATION

In dedication to my parents, my advisor, Dr. Rusman Rusyadi, B.Eng., M.Sc, without whom this thesis would be incomplete and for the advancement of Indonesia`s automation industry.

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