

Development of AGV Robot with Vision to Detect QR Code as Navigation Point

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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**Development of AGV Robot with Vision to Detect QR Code as Navigation Point**

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The purpose of this thesis is to make AGV navigation that detect QR code as the navigation point with ROS. The navigation system of the AGV is designed indoor with some obstacle around, creating industrial environment. QR code will be implemented by installed into some area (walls, beam, shelves) and then the robot will try to find the QR code that already programed to stop to the specified location in order of the QR code. The main program consist of reading the QR code and tracking the QR code so it will give the position of the QR code in the camera coordinate. Other program is for the AGV navigation system served as path planning and obstacle avoidance. To archieve this objective, the AGV will try to searching for the QR code while avoiding obstacle. After they found the QR code the camera will read the message in the QR code and then compare it with the one that the robot ordered to find. If it is a mismatch then the AGV will continue searching the QR code. If it matchs then the AGV will move forward to the QR code and stop (docking) in certain amount of time. While the AGV moving towards the point, the AGV will try to calibrate the position so the robot could docked. After docking for certain time, the AGV will move out from the docking area and then try to find another QR code until the AGV already docked to all the point. This AGV took inspiration from RCLL Robot Platform which tasked to go to the specified point and doing some work while stationed. The result is QR code reading for AGV accuracy is 80% - 90% for basic movement like following QR, straight line and rotation movement while searching QR. But it need more improvement if implemented in room because QR code reading ability is limited.

Keywords: AGV, ROS, QR code, Navigation, RCLL, FESTO, MPS.



DEDICATION

I dedicate this work to Jesus Christ,
My family, who have support me through this thesis projects,
My friends and teachers who have been my moral support and technical support,
All researchers for their help, support, and time throughout my thesis work.



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