DESIGNING AND CONSTRUCTING AN AUTONOMOUS MOBILE ROBOT WITH NATURAL NAVIGATION SYSTEM TO DELIVER GOODS IN A WAREHOUSE

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 purpose of this thesis is to design and construct an autonomous mobile robot with natural navigation system to deliver goods in an industrial environment. Autonomous mobile robot is a comprehensive intelligent system integrating environmental self-perception, dynamic decision-making and planning, behavior control and self-execution. The mobile robot uses laser radar as the core sensor for the positioning and navigation technology, the mobile robot can explore the unknown environment and obtain the two-dimensional environment map, and can realize the autonomous navigation of the mobile robot. The SLAM (Simultaneous Localization And Mapping) technology and the positioning and navigation technology in the known environment are studied. In the positioning problem, the developed robot uses laser radar and uses particle filter-based Monte Carlo positioning algorithm to obtain global positioning information. Several experiments for the SLAM mapping, autonomous navigation, positioning and navigation function of the robot were designed and tested. The test of the actual performance of the robot positioning and navigation function system in the real scene verifies the feasibility of the adopted system decision mode.

Keywords: *AGV, AMR, ROS, Autonomous Mapping, Autonomous Navigation, Path Planning, Obstacle Avoidance, Voice Command, AR Marker.*

DEDICATION

I would like to dedicate this thesis to the Almighty God, to my beloved families and friends, to my advisor and to all lecturers at SGU.

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