

**MICROCONTROLLER DESIGN FOR AN OMNIDIRECTIONAL MOBILE  
ROBOT  
(PROGRAMMING FOR SIMULTANEOUS LOCALIZATION, MAPPING,  
AND EXPLORATION)**

By

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BACHELOR'S DEGREE  
in

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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

### MICROCONTROLLER DESIGN FOR AN OMNIDIRECTIONAL MOBILE ROBOT (SLAM AND EXPLORATION)

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This paper is particularly intended to create a map through SLAM algorithm, in particular using Hector SLAM and explore the unknown environment using the Hector Exploration node. SLAM is an algorithm that used for creating a virtual map that can be used for environment sensing. Using the *mecanum* wheel or omnidirectional mobile robot where laser scanner sensor is used. RPLIDAR A2 is chosen for the laser scanner due its low-cost price while still producing a good set image of map. ROS framework is used to program for the robot since it provide ready-to-use packages regarding to SLAM. After the map was created, it will be used for dynamic path planning where it can provide the static map for the basic of the dynamic path planning. Through this process a sufficient map is created.

*Keywords: SLAM, ROS, Omnidirectional, Mecanum Wheel.*



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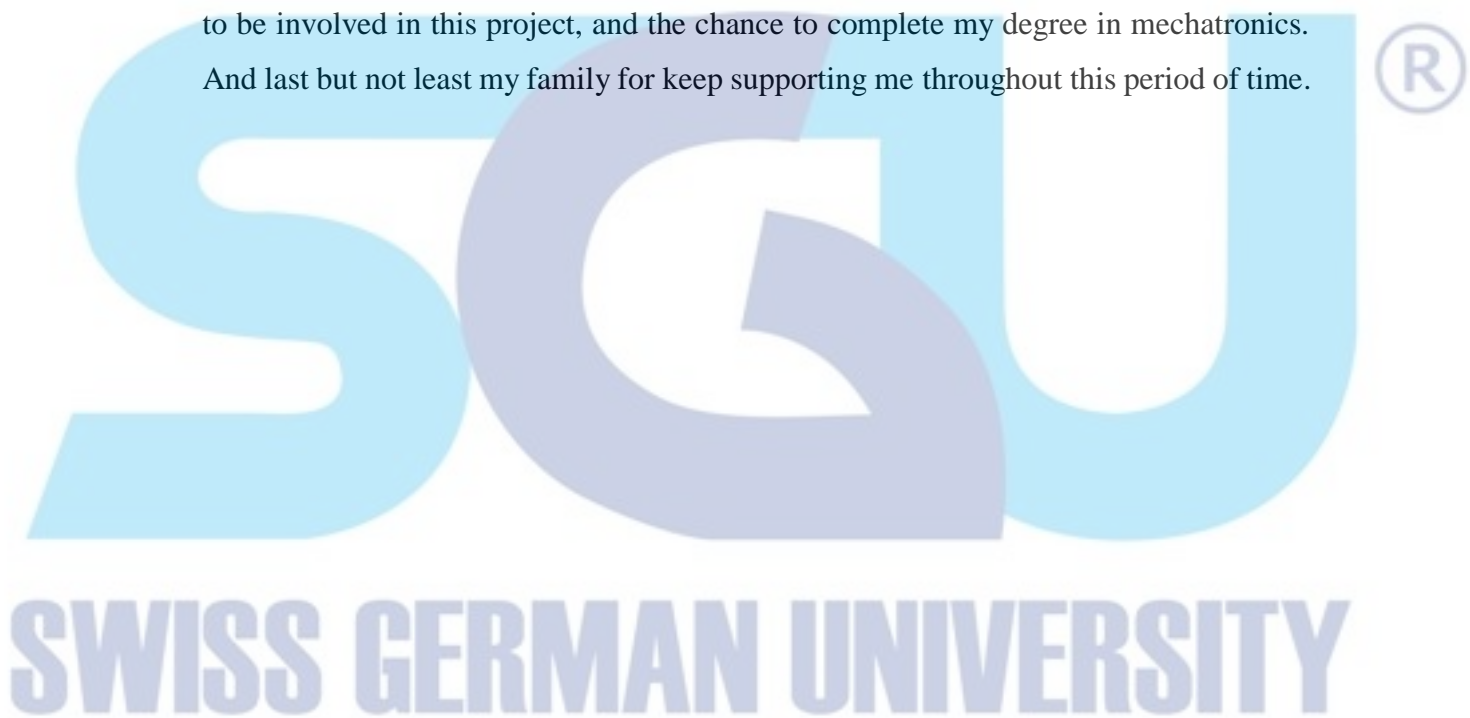
## **DEDICATION**

I dedicated my work for my family, God, SGU, and Indonesia



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