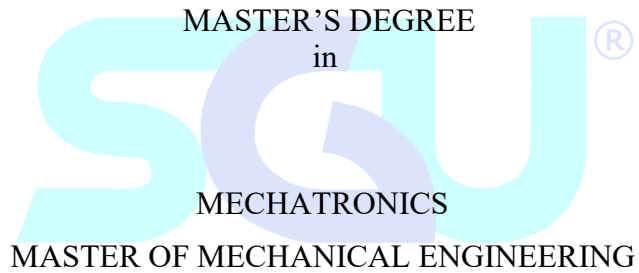


**MINIATURE PROTOTYPE AUTOMATED STORAGE AND RETRIEVAL SYSTEM
WITH SMALL CRANE AND LIGHT LOAD USING ARDUINO, RFID, AND IOT**

By

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2-2352-003

MASTER'S DEGREE
in
®
MECHATRONICS
MASTER OF MECHANICAL ENGINEERING



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July 2024

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

MINIATURE PROTOTYPE AUTOMATED STORAGE AND RETRIEVAL SYSTEM WITH SMALL CRANE AND LIGHT LOAD USING ARDUINO, RFID, AND IOT

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Nowadays, small and medium-sized companies face challenges in storing their products due to the increasing variety and the need to store them separately in specific locations. As land prices rise with growing populations, there is a necessity to use land more efficiently to avoid wastage. This project aims to address these issues by designing and developing a middle plate capable of handling up to 20 objects on shelves. The proposed Automated Storage and Retrieval System (ASRS) is designed to be reconfigurable for use across various enterprises. The project introduces new systems that optimize product storage using a modular approach where each product fits into a designated location. The ASRS consists of five floors, each with four stations, utilizing a sliding mechanism with a gripper positioned at the centre of the storage system. This mechanism retrieves materials from specific areas connected via a conveyor belt system. Object identification is managed through Radio Frequency Identification (RFID) technology. Furthermore, the proposed ASRS is adaptable for handling a variety of objects that share the same size and weight characteristics. Products are stored in predefined areas on high shelves. This system is particularly suitable for small and medium-sized companies seeking efficient material storage with single pallet

racking, providing uniform 10 cm height across all five floors. Importantly, the ASRS operates fully automated, minimizing human risk factors.

Keywords: Automated Storage Retrieval System (ASRS), Radio Frequency Identification (RFID),

Land prices, (twenty)20, objects, shelves, five floors, four stations, 10 cm.





DEDICATION

I dedicate this works for my family (my late father Mr. Ang Teng Sam, Mrs.Irene Siu Hua, Mrs.Angela Ang-lan, Mr. Ade Surya Maranatha Tarigan, Mrs. Agnes Ang Lili, Mr. Willi Bunaputra, Ms.Michelle Mathilda Ratulangi) and my company which I currently work Master Tianjin Logistic Equipment.



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From the beginning, he had confidence in my abilities to not only complete a degree but to complete it with excellence.

I have found my coursework throughout the Curriculum and Instruction program to be stimulating and thoughtful, providing me with the tools with which to explore both past and present ideas and issues.

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