UNIVERSITI TEKNOLOGI MARA

DESIGN ANALYSIS AND FABRICATE A FUNCTIONAL GRABBER FOR ROBOTIC ARM CAR

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Dissertation submitted in partial fulfillment
of the requirements for the degree of
Diploma
(Mechanical Engineering)

College of Engineering

ABSTRACT

A grabber for a robotic arm car is a well-known machine that has been deployed and used globally. It offers a lot of benefits in this day and age. First, the grabber is used to pick up an object of various shapes. There are many grabbers that already exist in this modern day, but they are not specifically for use in the kindergarten environment. In order to create the grabber for a robotic arm car to put it in kindergarten, it has to improve the design that already exists. The objective is to design and fabricate a functional grabber mechanism for a robotic arm car that is capable of securely grasping. This project shows the details of the process to produce the machine, from its design to fabricating it and all the manufacturing processes that it will undergo. This project aims for kindergarten teachers to help caretakers do chores while being more relaxed and to expose kids and children to the robotic world, thus making them interested and excited to know more and learn more about robotics.

ACKNOWLEDGEMENT

I would like to express my sincere appreciation to all those who supported me throughout the completion of this project. Firstly, I would like to express my gratitude to everyone who helped make this project a success, especially to my supervisor, Miss Liyana binti Roslan, who helped me in many ways with her patience, ideas, knowledge, support, and guidance.

I am also grateful to my lecturer and the UiTM Pasir Gudang for providing facilities and laying a strong foundation in mechanical engineering. Not forgetting also all the UiTM staff, especially the laboratory staff and technicians, who assist with various equipment and resources during fabrication.

Last but not least, I would want to thank my family and friends for their inspiration and motivation, which helped me stay focused during this journey. I've always been inspired by their unshakeable faith in my ability. Thank you.

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CHAPTER ONE
INTRODUCTION

1.1 Background of Study

Designing and fabricating a functional grabber for a robotic arm car involves the creation of a mechanical extension capable of grasping objects. This integral component integrates engineering principles with innovative design to enhance the functionality of robotic systems, enabling them to perform a myriad of tasks across various industries, from manufacturing to exploration [1]. The grabber's design must prioritize factors such as weight, strength, flexibility, and adaptability to diverse environments, ensuring optimal performance in real-world scenarios [2]. Fabrication techniques encompass a range of processes, from 3D printing to precision machining, each tailored to meet specific design requirements and production constraints [3]. Ultimately, the success of this endeavor hinges on the seamless integration of design ingenuity, technical expertise, and practical application, driving advancements in automation and robotics for the benefit of society [4].

Today, one significant issue related to the design and fabrication of grabbers for robotic arm cars is the need for functional and adaptability across diverse environments and tasks. Robotic systems often encounter dynamic and unpredictable situations, requiring grabbers that can efficiently grasp objects of varying shapes, sizes, and textures while navigating through complex terrains [5]. Additionally, considerations such as power consumption, cost-effectiveness, and ease of maintenance further complicate the design process [6].

To address these challenges, researchers and engineers are exploring innovative approaches such as modular grabber designs that can adapt to different tasks by changing attachments or configurations [7]. Advanced sensing technologies, including computer vision and tactile sensors, are integrated into grabbers to provide real-time feedback and improve grasp stability [8]. Furthermore, various machine learning algorithms enable robotic arm cars to learn from experience, enhancing their ability to manipulate objects in unstructured environments [9]. By combining these