UNIVERSITI TEKNOLOGI MARA

AN AUTOMATIC TARGET SHOOTER USING ARDUINO

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

College of Engineering

Feb 2025

ABSTRACT

The project aims to develop an Automatic Electronic Target Shooter, addressing limitations in existing products by introducing dynamic targets with horizontal movement, laser sensors for improved accuracy, and real-time scoring display. These enhancements cater to individual needs for challenge, precision, and feedback, providing a more engaging and fulfilling targeting experience. Additionally, the project has broader community and global significance, promoting physical activity, sustainability, and skill development. The project includes a functioning prototype with static and moving targets, accurate target detection using Arduino circuits, and a scoring display feature. Moreover, utilizes programming skills to ensure smooth operation of the system. Overall, this project represents a significant advancement in interactive target systems, with potential applications in entertainment, training simulations, and education.

ACKNOWLEDGEMENT

Completing my diploma has been an incredibly fulfilling journey, and I am deeply grateful to everyone who has supported me along the way.

First and foremost, I thank Allah for providing me with the strength, patience, and guidance to persevere. My heartfelt appreciation goes to my mother, Madam Rokiah and family, whose unwavering love and encouragement gave me the motivation to keep going even in challenging times. I am immensely grateful to my supervisor, Dr Azizul Hakim and lecturers, whose expertise and mentorship have been instrumental in shaping my understanding and skills. Lastly, I extend my gratitude to my friends, who stood by me, offering their friendship, collaboration, and moral support.

This achievement is a collective victory, and I am blessed to have had such wonderful people in my life throughout this journey.

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INTRODUCTION

1.1 Background of Study

The development of automatic electronic target shooters has gained considerable attention, especially in the fields of recreational shooting, training and simulations targeting technologies. Traditional target shooting systems often utilize stationary targets or simple mechanical movement mechanisms, which limit the realism of the training experience. However, advancements in sensor technology and automation have enabled significant improvements. By incorporating laser detection for real-time tracking and a dual-axis movement system, the latest iteration of an automatic electronic target shooter aims to address the limitations of previous models, offering both horizontal and vertical movement capabilities to simulate more diverse and challenging scenarios [1].

Introducing two levels of movement, horizontally and vertically, allows for a target might take in real-world conditions. This dual-axis movement also represents a leap forward in terms of versatility, as it simulates a wider range of dynamic environments, preparing users for varied and complex shooting situations [2]. Laser detection systems, on the other hand, offer a high degree of accuracy for hit detection, reducing errors compared to traditional mechanical or acoustic target sensors. As a result, combining dual-axis motion with laser detection can substantially improve target-shooting accuracy, reliability, and user engagement, particularly valuable for competitive shooters or individuals looking to enhance their targeting skills [3].

Other than that, by utilizing a system that detects laser “hits” with precision, the electronic target shooter can offer feedback in real time, enabling users to correct their aim promptly. Additionally, the use of laser detection aligns with safety and environmental considerations, as it eliminates the need for projectiles, making it an ideal solution for indoor training facilities and environments where safety is paramount [4]. This development highlights a commitment to enhancing target shooting devices by