UNIVERSITI TEKNOLOGI MARA CAWANGAN JOHOR KAMPUS PASIR GUDANG

FINAL YEAR PROJECT 2 (EEE368)

REPORT

FACE RECOGNITION DOOR LOCK SYSTEM

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ABSTRACT

The project aims to develop a secure and convenient door lock system that utilizes face recognition technology. The system's primary objective is to enhance security by accurately identifying individuals based on their facial features and granting access only to authorized personnel. The project involves designing and implementing a hardware and software solution that integrates a camera module, image processing algorithms, and a microcontroller based control unit. The camera captures the face of the person approaching the door, and the captured image is processed using facial recognition algorithms to match it against a preregistered database of authorized users. If a match is found, the door lock is automatically released, allowing entry. The system provides a reliable and efficient method of access control while eliminating the need for traditional keys or access cards, making it convenient for users. Additionally, the project considers factors such as accuracy, speed, and robustness to ensure a reliable and user-friendly face recognition door lock system.

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CHAPTER ONE

INTRODUCTION

1.1 Project Overview

The study of a face recognition door lock system project involves developing a system that utilizes facial recognition technology to control access to a secured area or manage the opening and closing of a door. This project typically involves setting up hardware components such as a camera, microcontroller or single-board computer, display, and electric lock mechanism. The process begins with capturing an image of the person in front of the door, followed by face detection algorithms to locate and identify the presence of a face. Face recognition techniques are then applied to compare the extracted facial features with a pre-existing database of known faces. If a match is found, the system verifies the identity and decides whether to grant access based on a predetermined threshold or confidence level. Upon successful verification, the system triggers the unlocking mechanism to open the door. The project also involves database management for adding, removing, and updating face records. The success of the project depends on factors like hardware quality and the accuracy of face detection and recognition algorithms. The increasing need for efficient access control and security systems has led to the exploration of advanced technologies, such as facial recognition, for enhancing door lock systems. Traditional key-based or password-based door lock systems have their limitations, including the risk of keys being lost or stolen or passwords being compromised. Face recognition technology presents a promising solution by providing a convenient and secure method for identifying individuals. However, implementing an effective face recognition door lock system presents several challenges. First, the system needs to accurately detect and locate faces in real-time, even under various lighting conditions and different orientations. Face detection algorithms must be robust enough to handle variations in facial appearance, facial expressions, and occlusions caused by accessories like glasses or masks. Furthermore, the system needs to accurately recognize and match the detected faces with a pre-existing database of known individuals. Face recognition algorithms should be able