

VOICE RECOGNITION DOOR ACCESS CONTROL SYSTEM



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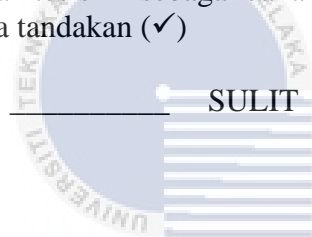
JUDUL: [VOICE RECOGNITION DOOR ACCESS CONTROL SYSTEM]

SESI PENGAJIAN: [2020/2021]

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VOICE RECOGNITION DOOR ACCESS CONTROL SYSTEM

NOR MUNIRA SYAFIQA BINTI MD ZAINI



This report is submitted in partial fulfillment of the requirements for the Bachelor of [Computer Science (Computer Security)] with Honours.

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FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2021

DECLARATION

I hereby declare that this project report entitled
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is written by me and is my own effort and that no part has been plagiarized
without citations.

STUDENT : NOR MUNIRA SYAFIQA BINTI MD ZAINI Date : 10/09/2021



I hereby declare that I have read this project report and found
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this project report is sufficient in term of the scope and quality for the award of
Bachelor of [Computer Science (Network Security)] with Honours.

SUPERVISOR : Nurul Azma Zakaria Date : 11/9/2021
(DR NURUL AZMA ZAKARIA)

DEDICATION

Specially dedicated to
My beloved parents, siblings and friend who have encourage, guided, and inspired
me throughout my journey of education.

To my helpful supervisor, thank you for the guidance from the beginning until the
end of the final year project



ACKNOWLEDGEMENTS

All praise to Allah because of Him, I manage to complete this Final Year Project (FYP). I would like to express my gratitude to my project supervisor, Ts Dr Nurul Azma Binti Zakaria on her invaluable advice, guidance, and her enormous patience throughout the development of the project and research. Without her guide, this report and project cannot be completed. Next, I would also like to express my gratitude to my beloved parents who have helped and given me support, motivation and encouragement throughout my project. In addition, I would like to thank my friends especially my classmate who had contributed to the successful completion of this project. I manage to complete my report and my project which is Voice Recognition Door Access Control System.



ABSTRACT

This project is focused on security door access control system which are most of institution or company still using the old method. The old method which are key mechanism or card as the key to unlock the door. I purposed this project to solve the problem of missing, misplaced and easy to duplicate the keys. Current system also not secure and can easily be hacked. The project that I purposed is Voice Recognition Door Access Control System. This project will only recognize the authorized users only to enter the door. In order to ensure the security of the door access control system, it will ask the users to speak random words on the spot which unauthorized users cannot used or played the recorded of the authorized user's voice. This project also will notify authorized users if they can enter the door successfully through Telegram. Therefore, this project is kind of door access control safety project for making the institution or company more safety and secure from unauthorized users. To make sure this project success I used Waterfall Model Methodology to help me in develop the project. For future works, this project can be improved by adding multifactor authentication.

ABSTRAK

Projek ini difokuskan pada sistem kawalan akses pintu keselamatan yang kebanyakan institusi atau syarikat masih menggunakan kaedah lama. Kaedah lama yang merupakan mekanisme kunci atau kad sebagai kunci untuk membuka pintu. Saya bertujuan projek ini untuk menyelesaikan masalah kehilangan, salah tempat dan mudah menduplikasi kunci. Sistem semasa juga tidak selamat dan boleh diretas dengan mudah. Projek yang saya maksudkan adalah Sistem Kawalan Akses Pintu Pengecaman Suara. Projek ini hanya akan mengenali pengguna yang dibenarkan hanya untuk memasuki pintu. Untuk memastikan keselamatan sistem kawalan akses pintu, ia akan meminta pengguna untuk mengucapkan kata-kata rawak di tempat yang tidak dapat digunakan oleh pengguna yang tidak sah atau memainkan rakaman suara pengguna yang dibenarkan. Projek ini juga akan memberitahu pengguna yang sah sekiranya mereka dapat memasuki pintu dengan berjaya melalui Telegram. Oleh itu, projek ini adalah jenis projek keselamatan kawalan pintu masuk untuk menjadikan institusi atau syarikat lebih selamat dan terjamin dari pengguna yang tidak dibenarkan. Untuk memastikan kejayaan projek ini, saya menggunakan “Waterfall Model” Metodologi untuk membantu saya dalam membangunkan projek ini. Untuk karya yang akan datang, projek ini dapat diperbaiki dengan menambahkan pengesahan multifaktor.

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LIST OF ABBREVIATIONS

FYP - **Final Year Project**



LIST OF ATTACHMENTS

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CHAPTER 1: INTRODUCTION

1.1 Project Background

Door access control system is a very important element in every facility and institutions as a precaution to prevent any theft incident or risk of a data breach. The purpose of this project is to only allow authorized users to enter server room using voice recognition system.

The keys can be misplaced or be stole and the biometric technology can be hacked. An individual's finger can be cut off to perform fingerprint scan, an eyeball can be removed to perform an iris scan, a pin or password can be hacked, and a picture of the individual can be used to perform facial recognition. The most accurate and more convenient is voice recognition technology. More products and gadgets are using speech recognition technology to make life simpler, as voice inputs are considerably more efficient than typing. Voice technology is so easy to use as it does not depend on the quality of the lighting as other biometrics such as retina or face recognition. It has a higher degree of acceptability among users than many other biometric identity verification techniques. This project we proposed has high level of security than others biometric technology.

This is the new technology compared to the old one which is only can recognize users. This voice recognition door access control system can give notifications through online platform which is Telegram when the system can authorize the users.

Nowadays, majority of people are using smart phones. So, it is better to develop a project based on network which is in IoT fields. Therefore, authorized users need to open the mobile application to access the phone's microphone and after the system recognize user's voice, the user can access the door and it will notify the user through Telegram.

1.2 Problem Statement

As commonly used, institutions or company still used the simple key and padlock to lock the door and password technology. So, the main problem is the keys can be easily misplaced or even can be stolen by unauthorized users. For password authentication system, it is very easy to be hacked because the password is stored in the database. Various method can be used to penetrate the system such as using sqlmap, sql injection or brute force attack to enter the database.

Table 1.1 Summary of the Problem Statement

PS	Problem Statement
PS1	Existing system not secured and can be hacked easily
PS2	Virus can be spread through physical touch

1.3 Project Question

Project question is to differentiate the issues that occur in problem statement in table 1.1. The 1.2 table displays the project questions summary based on the problem statement 1.1.

Table 1.2 Summary of the Project Question

PS	PQ	Project Question
PS1	PQ1	Can voice recognition system applied to door access?
PS2	PQ2	Can voice recognition system using mobile application make less physical interaction?

1.4 Project Objectives

Project objectives used to describe the things need to be completed. In order to accomplish the project objectives, targets are stated and need to be considered, that is from the problem statement and the project question. There are a few objectives that need be completed in this project and project objectives as shown below.

Table 1.3 Summary of the Project Objectives

PS	PQ	PO	Objectives
PS1	PQ1	PO1	To integrate the hardware with voice recognition system
		PO2	To test the voice recognition system
PS2	PQ2	PO3	To integrate voice recognition system with mobile application

1.5 Project Scope

The scope of this project is to develop an embedded system with the implement of voice recognition algorithm. This project involves a new design with low-cost material but higher security level. Plus, it was designed to eliminate the weakness of the current security system on the market. The boundary or coverage of this project was limited to institution or company uses. The design architecture, the structure of the embedded system and the programming skill are included in this project.

1.6 Project Contribution

Project contribution is estimated result from the project and substantial contribution of this project. This project uses voice recognition as a security mechanism. For the hardware prototype, the system will use Arduino Uno as the microprocessor and store all the user data. As for the voice recognition, the system will use python module to train the models. Users need to use their voice to unlock the door. Only voices that inside the database can be granted to unlock the door.

Table 1.4 Summary of the Project Contribution

PS	PQ	PO	PC	Project Contribution
PS1	PQ1	PO1	PC1	Voice recognition door lock system is developed
		PO2	PC2	Voice recognition system can recognize authorized users
PS2	PQ2	PO3	PC3	Authorized users can unlock the door using mobile application

1.7 Report Organization

There are 7 chapters in this thesis which are included of Introduction, Literature Review, Methodology, Analysis & Design, Implementation, Testing and Conclusion.

Chapter 1 is about the introduction of this project. There has problem statement, project objectives, project questions, scope of the project has been discussed and presented in this chapter. Chapter one is the project's background and about the problem faced without house appliance system. Explanation on major purpose of this system to the community. Project's aim and objective is also provided.

Chapter 2 is about the literature review which explains about preceding studies that was done before this system was introduced to the community. Greater overview of this project is achieved by using the studies as a reference.

Chapter 3 is about project's methodology, which contains projects prototype and, block diagram. This chapter consist of method used to develop this project. This will be the utilization of software and hardware which where the project is been implemented. Detailed explanations will be briefed about the software and hardware.

Chapter 4 is about analysis and design of project. There are requirement of analysis and hardware design. It is about the project's methodology while chapter five is about experimental. System prototype development is widely explained. It is a crucial part because it is to confirm the project's effectiveness upon completion.

Chapter 5 is about Implementation of the project which contains hardware configuration and software setup. Project's prototype development is widely explained.

Chapter 6 is about Testing the whole projects accomplishing its objectives. There are Testing connection of Arduino Uno, voice recognition system and mobile app connection with Arduino Uno testing.

Chapter 7 is about the overall project's conclusion. Also provide the future ideas that able to upgrade the current prototype.