

**UNIVERSITI TEKNOLOGI MARA**

**BIOMETRIC FINGERPRINT AUTHENTICATION  
FOR STUDENT ATTENDANCE SYSTEM**

**SITI NUR HIDAYAH BINTI MOHD YUSOFF**

**BACHELOR IN COMPUTER SCIENCE (Hons.) DATA  
COMMUNICATION AND NETWORKING**

**JULY 2021**

## **ACKNOWLEDGEMENT**

First of all, I would like to express my highest gratitude to the supervisor for this project, Prof. Dr. Jasni binti Mohd Zain for her guidance throughout this whole process of getting this report done. Her passion in sharing knowledge and information, advices, continuous motivation and emotional support has been a huge help for me in preparing this report. Without her, I would not be able to get this report done on time. I am really grateful to have a great supervisor like Prof. Dr. Jasni.

I would also like to thank my CSP600 lecturer, Madam Idura Ramli for her guidance and constructive criticism given throughout this semester. Thank you so much Madam Idura Ramli for giving us ample time for us to complete this report. Her guidance and motivation has inspired me to do work even harder to ensure that this project will be as successful as planned.

Finally, I would like to thank my friends and family for giving me moral support throughout this whole process of writing this report from the very beginning till the end. This report has given us a better view and chance to explore new technology to be implemented in our daily lives and learn something new. I hope we could always be each other's support system in the future. Thank you.

## **ABSTRACT**

Attendance taking and recording is a method that has been use widely across the world in order to detect whether a person is present or absent at an event. However, the traditional attendance recording method is not suitable to be use in this time and day anymore as it is time consuming, inconvenience and can be manipulate as well. Therefore, recording attendance by using Fingerprint Authentication is a better way to record attendance. This is because the level of accuracy is very high as the human fingerprint is unique and no other individual in this world share the same fingerprint as the other. Therefore, the results cannot be plagiarize or fabricated. This authentication method was developed using C++ programming language with Arduino as it microcontroller. This system uses matching mechanism to recognize the student's identity. Students will place their fingerprint on the scanner and their fingerprint will be compare with the pre-recorded fingerprint in the cloud storage. Once the fingerprint match, the student's attendance for the day will be recorded and the current status will be updated inside the cloud storage. The student's personal details such as their name, matric number as well as their class would be display at the small LED screen connected to the device once their current attendance status has been updated in the cloud storage.

## TABLE OF CONTENTS

<b>CONTENT</b>	<b>PAGE</b>
<b>SUPERVISOR APPROVAL</b>	<b>ii</b>
<b>STUDENT DECLARATION</b>	<b>iii</b>
<b>ACKNOWLEDGEMENT</b>	<b>iv</b>
<b>ABSTRACT</b>	<b>v</b>
<b>TABLE OF CONTENTS</b>	<b>vi-viii</b>
<b>LIST OF FIGURES</b>	<b>ix-x</b>
<b>LIST OF TABLES</b>	<b>xi</b>
<b>CHAPTER ONE: INTRODUCTION</b>	
1.1 Background of study	1
1.2 Problem Statement	2
1.3 Objectives	3
1.4 Scope and Limitation	3
1.5 Project Significance	4
1.6 Chapter Summary	5
<b>CHAPTER TWO: LITERATURE REVIEW</b>	
2.1 History of attendance	14
2.2 Internet of Things (IOT) (importance of IOT and examples of applications)	15
2.3 Biometric Authentication (Different types of authentication techniques and application in daily life)	16-17
2.4 Cloud computing and storage (What is cloud storage, how it works)	17
2.5 Methods (using Arduino as microcontroller, hardware devices that needs to be use)	18
2.6 Related works	19
2.6.1 Fingerprint Authentication Technique test results	19
2.6.2 Design of Fingerprint Authentication Technique	20-21
2.6.3 Improvements on previous work	21-22
2.6.4 Cloud based system	22

# CHAPTER ONE

## INTRODUCTION

In this chapter, a brief explanation regarding the background of the project and crucial information such as the problem statement and project scope and limitations was stated and explained in detail.

### **1.1 Background study**

Taking attendance has been used as a method to record who is present and who is absent be it in a working environment, school as well as tertiary education. According to Merriam-Webster (2020) Attendance is the act of attending something or someone. It is very crucial to record attendance as it is an important record that must be kept for further use as well as to ensure that one person is being responsible of their own actions. One example of method to record attendance is by preparing a name list of the students in one particular class and every students will hand down their signature at the designated paper. However, nowadays, in this modern era, we can see a lot more people and company has been working hard and coming out with new ideas and improvements in the technology and IT field in order to make their customers or also known as the end user's life easier. Based on the previous related work conducted by O Shoewu, O.A. Idowu (2012), a system called Automated Fingerprint Attendance System (AFAS) was used to make the attendance recording process faster and much more accurate. Based on the product testing done by the author, this technique is proven to have very low rate of failure which is 6% only and the whole attendance recording process only took 3.79 seconds for the Fingerprint Authentication system instead of 17.83 seconds by using the current technique. This test result proved that this new technique of recording attendance is a lot better than the current technique Hence, this project will focus on providing a much more convenient way of recording attendance among students, which is through Biometric Fingerprint Authentication method.