



**ATTENDANCE APPLICATION USING FACE RECOGNITION AND LOCATION BASED SERVICE  
USING MOBILE**

**UNDERGRADUATE THESIS**

**Submitted as one of the requirements to obtain**

**Sarjana Komputer**

**By:**

**VINCENT**

**001202000088**

**FACULTY OF COMPUTING  
INFORMATICS STUDY PROGRAM**

**CIKARANG**

**JUNE, 2020**

**ATTENDANCE APPLICATION USING FACE AND LOCATION BASED  
SERVICE USING MOBILE**

By

Vincent

Approved



---

Prof. Dr. Ir. Wiranto

Herry Utomo, M. Korn

Thesis Advisor



---

Cutifa Safitri, Ph.D.

Program Head of Informatics



---

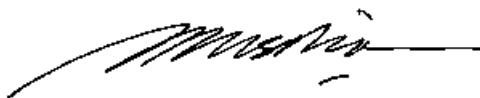
Rila Mandala, Ph.D

Dean of Faculty of Computing

## PANEL OF EXAMINER APPROVAL

The Panel of Examiners declare that the undergraduate thesis entitled **ATTENDANCE APPLICATION USING FACE RECOGNITION AND LOCATION BASED SERVICE USING MOBILE** that was submitted by **Vincent** majoring in **Informatics** from the Faculty of Computing was assessed and approved to have passed the Oral Examination on **Thursday June 15, 2023**.

### Panel of Examiner



RUSDIANTO ROESTAM

**Chair of Panel Examiner**



CUTIFA SAFITRI

**Examiner I**

## STATEMENT OF ORIGINALITY

In my capacity as an active student of President University and as the author of the undergraduate thesis/final project/business plan (underline that applies) stated below:

Name : Vincent  
Student ID number : 001202000088  
Study Program : Informatics  
Faculty : Computing

I hereby declare that my undergraduate thesis/final project/business plan entitled "ATTENDANCE APPLICATION USING FACE RECOGNITION AND LOCATION BASED SERVICE USING MOBILE" is, to the best of my knowledge and belief, an original piece of work based on sound academic principles. If there is any plagiarism, including but not limited to Artificial Intelligence plagiarism, is detected in this undergraduate thesis/final project/business plan, I am willing to be personally responsible for the consequences of these acts of plagiarism, and accept the sanctions against these acts in accordance with the rules and policies of President University.

I also declare that this work, either in whole or in part, has not been submitted to another university to obtain a degree.

Cikarang, 2023



( Vincent )

Full name & signature

## SCIENTIFIC PUBLICATION APPROVAL FOR ACADEMIC INTEREST

As a student of the President University, I, the undersigned:

Name : Vincent

Student ID number : 001202000088

Study program : Informatics

for the purpose of development of science and technology, certify, and approve to give President University a non-exclusive royalty-free right upon my final report with the title:

ATTENDANCE APPLICATION USING FACE RECOGNITION AND LOCATION BASED SERVICE USING MOBILE

With this non-exclusive royalty-free right, President University is entitled to converse, to convert, to manage in a database, to maintain, and to publish my final report. There are to be done with the obligation from President University to mention my name as the copyright owner of my final report.

This statement I made in truth.

Cikarang, 2023

A handwritten signature in black ink, appearing to be the name 'Vincent' written in a stylized, cursive script.

( Vincent )

Full name & signature

## ADVISOR'S APPROVAL FOR PUBLICATION

As a lecturer of the President University, I, the undersigned:

Advisor's Name : Prof. Dr. Ir. Wiranto Herry Utomo, M.Kom

NIDN : 0612076201

Study program : Informatics

Faculty : Computing

declare that following thesis:

Title of undergraduate thesis : ATTENDANCE APPLICATION USING FACE  
RECOGNITION AND LOCATION BASED SERVICE  
USING MOBILE

Undergraduate Thesis author : Vincent

Student ID number : 001202000088

will be published in **journal** / **institution's repository** / **proceeding** / **unpublish** /  
..... (underline one that applies)

Cikarang, 2023



( Prof. Dr. Ir. Wiranto Herry Utomo, M.Kom )

Advisor Full name & signature

# PLAGIARISM CHECK RESULT

revision 8

---

## ORIGINALITY REPORT

---

<b>16%</b>	<b>14%</b>	<b>1%</b>	<b>12%</b>
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

---

## PRIMARY SOURCES

---

<b>1</b>	<b>Submitted to President University</b> Student Paper	<b>6%</b>
<b>2</b>	<b>repository.president.ac.id</b> Internet Source	<b>5%</b>
<b>3</b>	<b>www.coursehero.com</b> Internet Source	<b>2%</b>
<b>4</b>	<b>theses.hal.science</b> Internet Source	<b>&lt;1%</b>
<b>5</b>	<b>journal.umg.ac.id</b> Internet Source	<b>&lt;1%</b>
<b>6</b>	<b>Submitted to West Herts College</b> Student Paper	<b>&lt;1%</b>
<b>7</b>	<b>Submitted to Colorado Technical University</b> Student Paper	<b>&lt;1%</b>
<b>8</b>	<b>Submitted to United Colleges Group - UCG</b> Student Paper	<b>&lt;1%</b>
<b>9</b>	<b>digitalcommons.mtu.edu</b> Internet Source	<b>&lt;1%</b>

---

## Stats

**Average Perplexity Score: 160.485**

---

A document's perplexity is a measurement of the randomness of the text

**Burstiness Score: 192.817**

---

A document's burstiness is a measurement of the variation in perplexity

Your sentence with the highest perplexity, "*President University 2.*", has a perplexity of: 771



## **ABSTRACT**

Manual attendance is inefficient, and signatures are often used as proof of attendance, which can be stolen or lost. A system that can eliminate these problems is needed. Developers want to record attendance flexibly, monitor activity, and use face recognition and area detection to proof of attendance. This final project aims to create a web-based application that makes it easier for users to record and monitor attendance from anywhere and at any time with an attendance system that uses face recognition and area detection. The methodology used is Rapid Application Development. The developer prioritizes requirements and constructs a website prototype with fully functional functionality. The user can give input during this process to ensure the application corresponds with the client. If all goes according to plan, the prototyping process will be repeated. Finally, the developer test, update, and add features to the application before it is sent to the client. The conclusion is that this application has been tested, and the results are what is expected, such as the user can do face recognition, the system can detect user location. The application is generally in line with expectations. This web-based e-commerce attendance management system uses face-api.js and geolocation API as the main feature for record attendance.

# DEDICATION

Appreciatively, I dedicate this thesis to Us, another part of myself that is always eager for challenges in life. And especially for:

1. President University
2. The whole lecturers at the Information Technology Department of the Faculty of Computing.
3. To our beloved Parents who always support me though their endless love and prayers, who always cheer me up, May GOD always give them health and always take care of them
4. All my best friends and family at Information Technology Department batch 2020
5. All those who have helped the researcher to complete the thesis which may not be mentioned one by one.

## **ACKNOWLEDGMENTS**

I have taken efforts in this project. However, it would not have been possible without the kind support and help of many individuals. I would like to extend my sincere thanks to all of them. I am highly indebted to Mr. Prof. Dr. Ir. Wiranto Herry Utomo, M.Kom for their guidance and constant supervision as well as for providing necessary information regarding the project and also for their support in completing the project. His constant guidance and willingness to share his vast knowledge made us understand this project and its manifestations in great depths and helped us to complete the assigned tasks on time. I would like to express my gratitude towards my parents and absentia project members. for their kind cooperation and encouragement which helped me in completion of this project. My thanks and appreciations also go to my colleagues in developing the project and people who have willingly helped me out with their ability.

# TABLE OF CONTENT

ABSTRACT.....	8
DEDICATION .....	9
ACKNOWLEDGMENTS .....	10
LIST OF FIGURES.....	16
LIST OF TABLES.....	18
CHAPTER I.....	19
INTRODUCTION .....	19
I.1 Background.....	19
I.2 Problem Statement.....	20
I.3 Objectives .....	20
I.4 Scope and Limitations.....	21
I.4.1 Scope .....	21
I.4.2 Limitations .....	21
I.5 Project Methodology.....	21
I.6 Final Project Outline .....	23
CHAPTER II.....	25
LITERATURE REVIEW .....	25
II.1 Rapid Application Development .....	25

II.2 DATABASE.....	27
II. 2 .1 Database Management System .....	27
II.2.2 Structured Query Language .....	27
II.2.3 MySQL .....	27
II.3 Express.js.....	28
II.3.1 HTTP Request.....	28
II.4 UML (Unified Modelling Language).....	28
II.4.1 Diagram UML.....	29
II.5 Model View Controller.....	31
II.6 Trilateration Theory (Geolocation API) .....	33
II.7 Related Work .....	34
II.7.1 CATAPA.....	34
II.7.2 Comparison Related Work .....	35
CHAPTER III .....	36
SYSTEM ANALYSIS.....	36
III.1 System Overview .....	36
III. 2 Function Analysis.....	37
III.3 Use Case Diagram.....	38
III.4 Use Case Narrative.....	39
III.5 Swim Lane Diagram.....	46

III.5.1 Login Swim Lane Diagram .....	46
III.5.2 Dashboard Swim Lane Diagram.....	47
III.5.3 Clock-In Swim Lane Diagram.....	48
III.5.4 Clock-Out Swim Lane Diagram .....	49
III.5.5 Logout Swim Lane Diagram .....	50
III.6 Hardware and Software Requirement .....	50
III.6.1 Hardware requirements.....	50
III.6.2 Software requirements .....	51
CHAPTER IV .....	52
SYSTEM DESIGN .....	52
IV.1 User Interface Design .....	52
IV.1.1 Agency Login Page .....	52
IV.1.2 Login by User .....	53
IV.1.4 Time Management Page.....	54
IV.1.5 Recording Page .....	55
IV.2 Class Diagram .....	55
CHAPTER V .....	56
SYSTEM IMPLEMENTATION.....	56
V.1 User Interface.....	56
V.1.1 Agency Login Page .....	56

V.1.2 User Login Page .....	57
V.1.3 Dashboard .....	58
V.1.4 Time Management Page .....	58
V.1.5 Record Page .....	59
V.2 Application Details .....	60
V.2.1 Database .....	60
V.2.2 Variable Deceleration .....	63
V.2.3 Enable CORS .....	63
V.2.4 Login User.....	64
V.2.5 Change Password .....	64
V.2.7 User today attendance .....	66
V.2.9 Total day of user attendance .....	68
V.2.10 Get all user from agency .....	68
V.2.11 Record Attendance .....	69
V.2.12 Timeliness user.....	70
CHAPTER VI .....	71
SYSTEM TESTING .....	71
VI.1 Testing Environment.....	71
VI.2 Testing Scenario .....	71
VI .2.1 Login & Register .....	71

VI.2.2 Home Page .....	73
VI.2.3 Clock-in Page .....	73
VI.2.4 Clock-out Page .....	74
VI.2.5 Face Recognition Scenario .....	74
VI.2.6 Area Recognition Scenario .....	76
VI.2.7 URL Manipulation Scenario.....	77
VI.3 Testing Summary .....	77
CHAPTER VII.....	78
CONCLUSION AND FUTURE WORKS .....	78
VII.1 Conclusion .....	78
VII.2 Future Works.....	78
REFERENCES.....	78



## LIST OF FIGURES

Figure I.1 Rapid Application Development (RAD) Diagram.....	22
Figure II.1 Use Class Diagram .....	29
Figure II.2 Use Case Narrative Diagram.....	30
Figure II.3 Swim Lane Diagram .....	30
Figure II.4 Class Diagram .....	31
Figure II.5 MVC architecture.....	32
Figure II.6 Trilateration Theory.....	33
Figure II.6 CATAPA.....	34
Figure III.1 Use Case Diagram.....	38
Figure III.2 Login Page Swim Lane.....	46
Figure III.3 Dashboard Swim Lane Diagram.....	47
Figure III.4 Swim Lane Clock-In.....	48
Figure III.5 Swim Lane Clock-Out.....	49
Figure III.6 Swim Lane Logout.....	50
Figure iv.1 Agency Page Design .....	52
Figure iv.2 Login Page (User Section) .....	53
Figure iv.3 Dashboard Page.....	53
Figure iv.4 Attendance.....	54
Figure iv.5 Record Page.....	55
Figure iv.6 Class Diagram.....	55
Figure V.1 Login Page (Agency Section) .....	57
Figure V.2 Login Page (User Section) .....	57

Figure V.3 Dashboard Page.....	58
Figure V.4 Time-Management Page.....	59
Figure V.5 Record Page.....	59
Figure V.6 Table Database .....	60
Figure V.7 Agency Table.....	60
Figure V.8 Attendance Table.....	61
Figure V.9 User Table.....	61
Figure V.10 Structure Table.....	61
Figure V.11 Connecting Database.....	62
Figure V.12 XAMPP.....	62
Figure V.13 Variable Deceleration.....	63
Figure V.14 Enable CORS.....	63
Figure V.15 Login User.....	64
Figure V.16 Change Password.....	64
Figure V.17 Agency Login.....	65
Figure V.18 User today attendance.....	66
Figure V.19 User Monthly Attendance.....	67
Figure V.20 User total attendance.....	68
Figure V.21 Get all user from agency.....	68
Figure V.22 Record attendance.....	69
Figure V.23 Timeliness User.....	70

## LIST OF TABLES

Table II.1 Related Work Different .....	35
Table III.1 Function Analysis.....	37
Table III.2 Use Case Narrative for “Login” .....	39
Table III.3 Use Case Narrative for “Access Dashboard Page” .....	40
Table III.4 Use Case Narrative for “Record Attendance” .....	42
Table III.5 Use Case Narrative for ‘Logout’ .....	44
Table III.6 Hardware Requirement.....	51
Table III.7 Software Requirement.....	51
Table VI.1 Testing Scenario Login & Register.....	71
Table VI.2 Testing Scenario Main Page.....	73
Table VI.3 Testing Scenario Clock-In Page.....	73
Table VI.4 Testing Scenario Clock-Out Page.....	74
Table VI.5 Testing Scenario Face Recognition Page.....	74
Table VI.6 Testing Scenario Area of Attendance.....	76
Table VI.7 URL Manipulation.....	77