

PROJECT REPORT

WEB-BASED ATTENDANCE SYSTEM USING FACE AUTHENTICATION

RSITAS

ANDRE NUGROHO PRANOTO 19.K1.0026

Faculty of Computer Science Soegijapranata Catholic University 2021

APPROVAL AND RATIFICATION PAGE



HALAMAN PENGESAHAN

Judul Tugas Akhir: Web-based Attendance System using Face Authentication Diajukan oleh Andre Nugroho Pranoto NIM : 19.K1.0026 101 Tanggal disetujui 21 Desember 2022 Telah setujui oleh Pembimbing : Y.b. Dwi Setianto S.T., M.Cs. Penguji 1 Yonathan Purbo Santosa S.Kom., M.Sc Penguji 2 Hironimus Leong S.Kom., M.Kom. R. Setiawan Aji Nugroho S.T., MCompIT., Ph.D Penguji 3 Peng<mark>uji 4</mark> Rosita Herawati S.T., M.I.T. Penguji 5 Y.b. Dwi Setianto S.T., M.Cs. Penguji 6 Yulianto Tejo Putranto S.T., M.T. Rosita Herawati S.T., M.I.T. Ketua Program Studi Dr. Bernardinus Harnadi S.T., M.T. Dekan

Halaman ini mer<mark>upa</mark>kan halaman yang sah dan dapat diverifikasi melalui alamat di bawah ini.

sintak.unika.ac.id/skripsi/verifikasi/?id=19.K1.0026

DECLARATION OF AUTHORSHIP

I, the undersigned:

Name : Andre Nugroho Pranoto

ID : 19.K1.0026

declare that this work, titled "Web-Based Attendance System Using Face Authentication",

and the work presented in it is my own. I confirm that:

- 1. This work was done wholly or mainly while in candidature for a research degree at Soegijapranata Catholic University
- 2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated.
- 3. Where I have consulted the published work of others, this is always clearly attributed.
- 4. Where I have quoted from the work of others, the source is always given.
- 5. Except for such quotations, this work is entirely my own work.
- 6. I have acknowledged all main sources of help.
- 7. Where the work is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself.

Semarang, December, 28, 2022

Andre Nugroho Pranoto 19.K1.0026

HALAMAN PERNYATAAN PUBLIKASI KARYA ILMIAH UNTUK KEPENTINGAN AKADEMIS

Yang bertanda tangan dibawah ini:

Nama: Andre Nugroho PranotoProgram Studi: Teknik InformatikaFakultas: Ilmu KomputerJenis Karya: Skripsi

Menyetujui untuk memberikan kepada Universitas Katolik Soegijapranata Semarang Hak Bebas Royalti Nonekslusif atas karya ilmiah yang berjudul "Web-Based Attendance System Using Face Authentication". Dengan Hak Bebas Royalti Nonekslusif ini Universitas Katolik Soegijapranata berhak menyimpan, mengalihkan media/formatkan, mengelola dalam bentuk pangkalan data (database), merawat, dan mempublikasikan tugas akhir ini selama tetap mencantumkan nama saya sebagai penulis / pencipta dan sebagai pemilik Hak Cipta.

Demikian pernyataan ini saya buat dengan sebenarnya.

Semarang, 28 Desember 2022 Yang menyatakan

Andre Nugroho Pranoto 19.K1.0026

ACKNOWLEDGMENT

First, I expresses my highest gratitude to Jesus Christ for blessing, love, opportunity, health, and mercy to complete this undergraduate thesis. This undergraduate thesis entitled "Web-Based Attendance System using Face Authentication" is submitted as the final requirement in accomplishing undergraduate degree at Information Technology, Computer Science, Soegijapranata Catholic University

I have received a myriad of support, advice, and assistance throughout this document writing. I would like to thank my supervisors *Y.b. Dwi Setianto S.T., M.Cs.* for formulating this topic and help in writing this thesis. I would like to thank *my beloved family* for giving me endless love, support and also worked to give me comfortable facilities in completing my study in Soegijapranata Catholic University. You gave me great escape to rest my mind from my thesis.

My gratitude also goes to my beloved girlfriend *Gracella Ignasha Gunawan* who always be my support system everyday. I am very grateful to have a supportive girlfriend, who sincerely helps and supports me until I can finished all.

Last but not least, I am also very grateful to have some close friends who always support me. My appreciation goes to *Christian Yap*, *Tan Yudistira*, *Jevon Carla*, *Davin Chang*, *and Kevin Christanto* who always accompanies and encourages me in every class until the end of semester and until now I can finish this document.

Semarang, December, 28, 2022

Andre Nugroho Pranoto 19.K1.0026

ABSTRACT

Attendance is a crucial task that wastes a lot of time and very vulnerable to being cheated if done manually. Many automatic methods, such as fingerprint biometric attendance also available for this purpose. But, as we know this methods waste time as well because we must form a line to place our thumb on scanning device.

Face recognition is a biometric information process that is easier to use and has a greater operating range than other biometric. Facial recognition systems are built on computer programs that analyze images of human faces for the purpose of identifying them. Location-based services bring together geospatial technologies, information and communication technologies, and the Internet to deliver targeted information to people in real time based on their geographic location.

Attendance system that combines facial recognition and geolocation can prevent fraud in attendance such as off-site attendance or what the Indonesians said as "Titip Absen". Our system automatically detect fraud if employee or students make an off-site attendance so they can't make an attendance.

In this paper, I propose an Openface Algorithm for face extraction from an image and combined with Cosine Similarity to doing verification job.

Keyword: face recognition, attendance system, location-based services, biometric, OpenFace Algorithm, Cosine similarity..

COVER	i
CHAPTER 1 INTRODUCTION	10
1.1. Background	10
1.2. Problem Formulation	10
1.3. Scope	11
1.4. Objective	11
CHAPTER 2 LITERATURE STUDY	12
CHAPTER 3 RESEARCH METHODOLOGY	14
3.1 Collecting Dataset	15
3.2 Extracting Face from an Image	16
3.3 Euclidean Distance	17
3.4 Cosine Similarity	
3.5 Deploy Website using Streamlit Library	19
CHAPTER 4 ANALYSIS AND DESIGN	20
4.1. Analysis	20
4.2. Design	20
CHAPTER 5 IMPLEMENTATION AND RESULTS	24
5.1. Implementation JAPB	24
5.2. Results	26
CHAPTER 6 CONCLUSION	

TABLE OF CONTENTS

LIST OF FIGURE

Figure 3.1 How Face Recognition works	14
Figure 3.2 Dataset from Kaggle	15
Figure 3.3 Downloaded Dataset	15
Figure 3.4 Dataset for Attendance Website	16
Figure 3.5 Openface Algorithm	17
Figure 3.6 Numpy Save File	17
Figure 3.7 Euclidean Distance	18
Figure 3.8 Cosine Similarity	18
Figure 3.9 Attendance Web-Apps	19
Figure 4.1 Face Authentication Flowchart	21
Figure 4.2 Face Image Input	22
Figure 4.3 Face Detection and Cropped Representation	22
Figure 5.1.1 User Successfully taking Attendance	24
Figure 5.1.2 User Face Not Detected	25
Figure 5.1.3 User Face Not Verified	25
Figure 5.1.4 User Attendance Report	26
Figure 5.2.1 Experiment Fraud of Face Authentication	29

LIST OF TABLE

Table 4.1	Openface Models	23
Table 5.2.1	Positive & Negative Prediction	26
Table 5.2.2	TP,TN,FP,FN	27
Table 5.2.3	Results of Classification Report	27
Table 5.2.4	Finding Best Threshold with 60 Data Testing	28
Table 5.2.5	Performance Time	28

/