CHAPTER I

INTRODUCTION

1.1 Background

The Academic System is a software tool that provides students with convenient access to academic resources such as lectures, seminar submissions, projects, and trial schedules, among others. The ArSys platform has previously been utilized for Electrical Engineering at FPTK Indonesia University of Education, and does not currently rely on facial recognition. Enhancing the platform with face recognition technology is expected to improve its performance and better meet the academic community's needs.

The face recognition process, have beginning with detection of face in real-time in front of the camera. This face is then identified and processed by Computer Vision (CV) using Deep Learning methods (Liu et al., 2017). The system uses Convolutional Neural Network (CNN) techniques to match the face recognition with the database, and then combines Flutter libraries with Neural Network Machine Learning technology to create an attendance recording system that accurately recognizes faces (Sun et al., 2018).

Previous studies has extensively covered face recognition features and their implementation in diverse fields. Earlier attendance recording systems relied on the Viola Jones algorithm (Fachmi et al., 2019) and operated through web browser applications that relied on search engines. But with new research, Flutter is now used to create more efficient and easily accessible systems. Another study had created an Android-based attendance recording application (Radityatama, 2017), but the authors identified challenges in saving facial databases and achieving accurate facial recognition, which was time-consuming.

This undergraduate thesis research focuses on utilizing Flutter to create an attendance recording application that uses Machine Learning, Computer Vision, and Artificial Intelligence technologies for face recognition. The resulting output is an application that is compatible with smart mobile. The objective of this research is to address issues related to manual attendance recording. Integrating an attendance recording application with Arsys academic system can facilitate

faster and more precise attendance recording.

The main objective of this research is to create an attendance recording system based on face recognition and artificial intelligence that is integrated with the ArSys academic system in real-time. The goal is to produce better results than previous research studies and to contribute to the realization of a Smart Campus.

1.2 Research Problem

1. How to build a smart mobile attendance application using Flutter and Artificial Intelligence?
2. How to build an attendance recording application that can be integrated with the academic system?
3. What is/are the result/s of face recognition and accuracy using Flutter and Artificial Intelligence?

1.3 Research Objective

1. Developing an intelligent mobile attendance system that is integrated with an established academic system
2. Applying the use of the attendance recording application integrated with the academic system
3. Obtaining face recognition results and accuracy using Flutter and Artificial Intelligence.

1.4 Limitation of Problem

1. The application is only focused on students of Indonesia University of Education.
2. The method used to create the application is Flutter and Artificial Intelligence.
3. The application requires a dataset of faces to be detected and must be in real-time in front of the camera

1.5 Research Benefit

To create innovation in the academic system in ArSys for recording student attendance by utilizing Artificial Intelligence and Flutter technology in fast and accurate face recognition.

1.6 Research Paper Structure

The current study consists of five chapters which discuss the following matters:

Chapter 1 Introduction, this section presents the background of the research, research problem, research objectives, research limitations, research benefits, and organizational structure used in the thesis. And then, Chapter 2 Literature Review, in this section contains the scientific foundation of the research conducted is explained, including knowledge about Artificial Intelligence, Flutter, Face Recognition, Computer Vision, and Deep Learning. Chapter 3 Research Methodology, this section talking about the research design is presented and the system used, as well as the tools and materials used in the research are explained. Chapter 4 Result and Discussion, it presents the results of the research conducted, including the Integrated Attendance Application Based On Face Recognition and Artificial Intelligence With Academic System, and the accuracy results of the developed application. And the last, Chapter 5 Conclusion and Suggestion, in this section will present the conclusion of the research findings. It will also provide recommendations for future studies.