BAB 1
PENDAHULUAN

1.1 Project Background

Rapidness advancement of technology, specifically after Covid-19 pandemic educational online resources has grown significantly which has been spread through various channels and became very popular among students around the world because the flexibility of online environment which can be accessed by anyone, anywhere, and at any time (Stoian et al., 2022). Sudden transition to online educational caused by Covid-19 not only brought benefits such as flexibility, convenience environment but also presents challenges such as conducting secure online examinations to prevent cheating during the examination.

Technological significant advancement of online education learning has introduced new challenges to maintain academic integrity, particularly in online environment. This challenges due to the variant type of cheating, including identity impersonation which most concerning of cheating in online environment, where a student has another unauthorized individual to complete their examination. Compared to the traditional examination with live observation by invigilator, online examination offers greater opportunities for be able to do cheat due to the lack of invigilator physical observation and accessibility of digital sources and communication. These issues highlight needed for innovative solutions to achieve fairness academic in virtual environment(Holden et al., 2021).

To address the problem of impersonation which having another person to complete an online exam this project proposes the development of face recognition application for quiz login systems. By utilizing the power of Convolutional Neural Network (CNN), the system will authenticate the identity of every student before granting access to the application to take online quiz examination. The application leverages an advanced and lightweight CNN architecture optimized for mobile devices and embedded vision task. MobileNetV2 also demonstrates a good accuracy which is suitable for real-time case of face recognition on mobile devices that has limited resources.

The face recognition system will ensure that only authorized students can gain access to the application to conduct quizzes, effectively addressing the problem of identity theft and improving the integrity of online exams. By combining the efficiency of MobileNetV2 with real-time facial recognition to obtain a secure authentication system, this project is to develop a mobile-based application that has a secure authentication system along with providing materials to students as study materials when conducting quizzes.

1.2 Problem Statement

The rapid advancement of development technology accompanied by the post-Covid-19 pandemic shifting to online education which has caused online education

to become increasingly more popular than before this has made the provision of materials and online exams an important component in learning.

Despite its popularity, online learning faces significant challenges specifically online exams with traditional authentication system, the common challenges are identity impersonation caused unregistered people to be able to take exams held in the name of registered students.

The rise of popularity of face recognition system adaption for authentication system, ranging from mobile device to door control access, making it a convenient choice for various applications, this widespread adaption of face recognition has exposed vulnerabilities to spoofing attacks.

1.3 Research Objectives

1. To develop mobile application with a supporting web platform for managing and delivering educational materials and online exams.
2. To implement face recognition model using MobileNetV2 for secure user authentication, preventing identity impersonation.
3. To implement real-time blink detection within the face recognition system to enhance authentication security by differentiating live users from static images.

1.4 Project Scope

1.4.1 Scope of System

1. **Capture Image and Image Upload**
   Users can capture their face image by blinking both eyes. To ensure security, taking pictures can only be done through the camera so it does not use the gallery. The image that has been captured by users will be uploading automatically.
2. **Image Preprocessing and Classification**
   After the face image is uploaded it will go through convolutional layer and then ReLU and pooling layer this whole process done by utilizing MobileNetV2 architecture.

1.4.2 Scope of User

1. **Access to Application**
   After the classification process is complete and the result is verified, it will directly move the user into home pages.
2. **Display of Material**
   Users can view and read all the materials that have been provided. Material can be different from other users. Helper features have been provided such as displaying materials based on categories which aim to make it easier for users to find the desired material based on categories.
3. **Taking Exam**

Users can take the quizzes provided which are limited to one attempt only.

1.4.3   Scope of Admin

1. **Generate Materials**
    Admin are allowed to create new material for user
2. **Generate Quiz**
    Admin are allowed to create new quiz for user

1.4.4   Scope of Super Admin

1. **User and Content Management**
    Super Admin are allowed to manage user, materials, and quizzes data.
2. **Database Management**
    Super Admin given the authority to access the database and make modifications of user data that is no longer needed.

1.5 Project Significance

The proposed AI-based system of facial recognition utilizing lightweight of Convolutional Neural Networks architecture by using MobileNetV2 addresses the critical issue of identity impersonation in online examinations. Impersonation not only undermines academic integrity but also creates unfairness in the assessment process, impacting the credibility of educational institutions.

This mobile application fills the existing gap by providing a robust and efficient solution for verifying student identities in real-time. By ensuring that only authorized users can access materials and quizzes, the system enhances the fairness and reliability of online assessments. Furthermore, the lightweight and efficient architecture of MobileNetV2 makes the solution highly adaptable for mobile and resource-constrained environments, offering scalability for widespread adoption in educational settings.

1.6 Chapter Summary

This chapter provides the key aspect of the proposed mobile application which integrates with face recognition for secure login system, leveraging lightweight CNN architecture using MobileNetV2. This development system is motivated due Covid-19 pandemic, which introduced an opportunity and challenges of online education learning for maintaining fairness of academic integrity standards. Among those of challenges issues, particularly the most common cheating is identity impersonation which is a critical issue.

Development of a mobile application implements a real-time facial recognition system enhanced security against identity forgery can be maintained. Image capture can be done through blink detection, which will proceed by the MobileNetV2 and classification will be conducted to identify each face.

The functionality of application such as access to materials and quiz attempts are the main features provided in this project. The significance of this project emphasizes a system that aims to overcome identity impersonation in order to improve academic integrity and support the ever-growing online education.