

## **ABSTRACT**

As time progresses, technology has made human life safer, more comfortable, and easier. With the development of Internet of Things (IoT) technology, which allows convenience in various aspects, it is expected to be integrated into the "Smart Home" system. Therefore, through research on smart home related to a prototype of a smart door with face recognition authentication, it is expected to simplify the process of entering and leaving the house and enhance security due to the presence of an Android application that enables remote management.

The product to be developed consists of a prototype device, a deep learning model, and an application. This document presents the proposed system concept, its workings, as well as the details of the product costs, along with the reasons and considerations for choosing certain components. There are two system options in realizing this smart door system. The first concept runs deep learning on a Raspberry Pi as both a microcomputer and microcontroller in the system. Meanwhile, the second system uses ESP32-CAM as the microcontroller and camera for capturing images. The concept of using ESP32-CAM is chosen as the solution to the existing issues.

The results of this research demonstrate that the entire smart door prototype system can work well with the presence of four sub-systems, namely IoT, deep learning, Android application, and cloud computing. Testing is carried out to ensure functionality and security, including the ability to detect individual faces, automatically capture and send images, and remotely manage the door through the Android application. The face recognition system uses several deep learning algorithms implemented on ESP32-CAM to function effectively in detecting users based on captured images. The test results also indicate the accuracy and responsiveness of the system to user commands. Based on these results, the smart door prototype shows potential for enhancing security and convenience in monitoring and managing home door access automatically and integrated with Smart Home technology.

Keywords: Smart Door Prototype, IoT, Deep Learning, Android Application, Cloud Computing.