

ABSTRACT

This final project discusses the implementation of a face recognition-based smart door lock system using the Huskylens AI camera. The system is designed as an additional authentication method for the BARDI Smart Lock to enhance access flexibility and convenience through automatic door unlocking. The Huskylens camera detects faces locally without requiring an internet connection. When a registered face is detected, the ESP32 microcontroller sends a door unlock command to Tuya Cloud, which is connected to the BARDI Smart Lock. Cloud communication is secured using authentication methods such as access token, sign, and ticket ID. Test results show that the system achieves an average response time of 3 seconds from face detection to door unlocking, with a face recognition accuracy of 64%. The system remains functional under various lighting conditions (20–300 lux) and operates efficiently with a sleep mode that activates when no activity is detected. With stable performance, energy efficiency, and secure cloud integration, this system is suitable for smart home and IoT-based laboratory environments.

Keywords: Smart Door Lock, Face Recognition, Huskylens, IoT, ESP32, Tuya Cloud