



## INTISARI

### ***SMART DOOR LOCK MENGGUNAKAN SISTEM FACE RECOGNITION DAN TEXT-TO-SPEECH MELALUI APLIKASI BLYNK***

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Keamanan ruang server merupakan aspek penting untuk menjaga integritas dan ketersediaan data. Sistem kunci konvensional memiliki kelemahan seperti kehilangan, duplikasi, dan penyalahgunaan. Penelitian ini merancang dan mengimplementasikan *smart door lock* berbasis IoT dengan ESP32-CAM untuk pengenalan wajah, *streaming* kamera *real-time*, serta kendali solenoid otomatis dan manual melalui aplikasi Blynk. Sistem dilengkapi notifikasi berbasis Blynk dan *text-to-speech* berbasis browser yang memutar suara konfirmasi saat pintu berhasil terbuka. Wajah pengguna didaftarkan melalui *dashboard*, dan proses pengenalan dilakukan secara lokal melalui komunikasi *WebSocket* untuk menjaga kecepatan dan keandalan. Pengujian dilakukan pada berbagai kondisi seperti jarak, atribut wajah, ekspresi, pencahayaan, dan jumlah wajah dalam satu *frame*. Hasil menunjukkan sistem mampu mengenali wajah yang terdaftar dengan rata-rata waktu respon 1,7 detik dan akurasi rata-rata 92% pada jarak optimal 50 cm dengan pencahayaan >300 lux. Sistem juga mampu mengaktifkan solenoid dalam 1 detik, memutar suara notifikasi secara *real-time*, dan mendukung pemantauan jarak jauh melalui *dashboard* publik berbasis VPS dan FRP secara stabil.

Kata kunci: *Blynk*, Pengenalan wajah, *Internet of Things*, *Smart Door Lock*, *Text-to-Speech*

## ABSTRACT

### ***SMART DOOR LOCK USING FACE RECOGNITION AND TEXT-TO-SPEECH SYSTEM THROUGH BLYNK APPLICATION***

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*Server room security is crucial to maintain the integrity and availability of stored data. Conventional key-based locking systems have weaknesses such as loss, duplication, and unauthorized use. This study designs and implements an IoT-based smart door lock using ESP32-CAM for face recognition, real-time camera streaming, and both automatic and manual solenoid control via the Blynk application. The system includes Blynk-based notifications and browser-based text-to-speech, which plays a confirmation sound when the door is successfully unlocked. User faces are registered through a dashboard, and the recognition process is performed locally using WebSocket communication to ensure speed and reliability. Tests were conducted under various conditions such as distance, facial attributes, expressions, lighting, and the number of faces in a frame. Results show the system can recognize registered faces with an average response time of 1.7 seconds and an average accuracy of 92% at an optimal distance of 50 cm under lighting >300 lux. The system can also activate the solenoid within 1 second, play audio notifications in real-time, and support stable remote monitoring via a public VPS- and FRP-based dashboard.*

*Keyword: Blynk, Face Recognition, Internet of Things, Smart Door Lock, Text-to-Speech*