DESIGN OF AN AUTOMATIC DOORSTOP FOR RESIDENTIAL SECURITY USING A MICROCONTROLLER-BASED INTELLIGENT CAMERA WITH IMAGE RECOGNITION FEATURES

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ABSTRACT

Character detection is an innovative technology that converts text images into a digital text format, known as Optical Character Recognition (OCR). In this study, OCR is employed to transform license plate images into text. This technique will be integrated into the development of an automatic door barrier system for residential areas. The system combines Internet of Things (IoT) technology with OCR. IoT serves as a network that connects devices, enabling them to communicate with one another, while OCR acts as a character recognition tool, facilitating automation within the system. The primary electronic components utilized in this study include the ESP32-CAM, PIR sensor, servo motor, LED, and buzzer. Additionally, the database employed is a NoSQL database using the Firebase platform. Based on the tests conducted, the system can accurately detect license plate characters with an average accuracy rate of 98.6%. This average is derived from four accuracy test results: the first test yielded an accuracy of 99.90%, the second test achieved 100%, the third test recorded 99.00%, and the fourth test resulted in 95.50%.

Keywords: Internet of Things (IoT), Optical Character Recognition (OCR), NoSQL Database, System, Firebase