

ABSTRACT

IoT technology is a technology that can be applied in various fields and can monitor and control activities connected to the internet connection. Activities that can be implemented using IoT can be physical or virtual devices. In the field of smart infrastructure in Indonesia. Many real-time detection systems based on computer imaging have been developed. some of these computer vision-based devices are connected to the internet network or are included in the IoT category. Among them are ETLE (Electronic Traffic Law Enforcement) or electronic ticketing, facial recognition biometric security systems on smartphones, to facial recognition authentication for financial service application security.

In this proposal, the use of the Internet of Things will be proposed for the development of automatic gateways using object detection methods. In this study, the object selected is a real-time image or video of a car and its license plate. The main devices that will be used are a camera (webcam) as a tool to take pictures of the car and its license plate, Raspberry Pi as a medium for computing/processing object detection, and a servo that functions as a prototype of a gate. The results of this system will be integrated into the Firebase *database* to view its output on the *database*.

From the test results of the object detection program, using the algorithm of the YOLOv4 object detection model (You Only Look Once), the number plate detection accuracy is obtained with a score of 0.9196 or 91%. This means that the detected object has a similarity value of 91% with the dataset in the program. In addition to testing the accuracy of object detection, the quality of network performance or Quality of Service (QoS) such as throughput, delay, jitter, and packet loss from the Raspberry Pi to the Firebase database is also tested. In the QoS test, the average throughput is 29.661,533 bps, the average packet loss is 0%, the average delay is 24,244 ms, and the average jitter is 32,3351 ms.

Keywords: Network performance, object detection, YOLOv4, Raspberry Pi, Internet of Things, *database*, QR code