

Smart Railway Signal and Gate Automation for Road Vehicle Safety

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Abstract: *The Smart Railway Signal and Gate Automation System is designed to improve safety at railway level crossings by automating gate control and signal operations. The system uses an ESP32 microcontroller along with IR sensors and a vibration sensor to detect the arrival and movement of trains. Based on sensor inputs, the controller automatically operates servo motors to open and close the railway gate. Signal lights and buzzers are activated to alert road users about an approaching train. The system also supports IoT functionality using the Blynk application for remote monitoring and control. This system reduces human intervention, minimizes accidents, and ensures smooth and efficient traffic management, making it suitable for modern smart transportation systems.*

Keywords: Smart Railway Gate Automation, ESP32 Microcontroller, Infrared (IR) Sensors, Servo Motor Control, Internet of Things (IoT), Railway Safety Systems, Embedded Systems, Blynk Application

