

Railway Track Crack Detection and Accident Robo

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Abstract: The goal of this project is to create a robot that can detect accidents on railway tracks using a variety of sensors and an Arduino Uno microcontroller. The system's goal is to increase railway safety by spotting track irregularities and quickly responding to mishaps. An Arduino Uno board, an ultrasonic sensor, a GPS module, a buzzer, a DC motor, a motor driver, an accelerometer, and a Bluetooth terminal are among the major parts of the system the robot can anticipate potential threats ahead and take appropriate action by using the ultrasonic sensor to detect impediments or barriers on the railway rails. A built-in accelerometer can identify unusual vibrations or anomalies on the rails, which may point to track flaws or loose parts. In such situations, the system can quickly alert the maintenance team for immediate attention, ensuring the railway network runs without a hitch. The robot's precise location is tracked using the GPS module, allowing for network-wide monitoring and data logging. Planning for maintenance and additional analysis can be done using this data. The buzzer will sound to alert people in the area in case of an accident or emergency, and the accelerometer will give more details on the impact's severity. This information aids in assessing the possible harm inflicted and can be vital for emergency response teams. This research offers a complete approach to detecting railway tracks preventing accidents. The technology improves safety, reduces accidents, and aids in the smooth functioning of railway networks by combining several sensors and using Arduino Uno as the central processing unit.

Keywords: Ultrasonic Sensor, Arduino UNO, Accelerometer, GPS, Crack, Bluetooth Terminal.

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