

IoT based Train Track Checking System

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Abstract: *The IoT-based railway tracks monitoring system aims at safety improvement, predictive maintenance, and operation cost reduction. At present, manual inspections require a lot of time and may contain human errors; real-time data measurement is not possible with these manual inspections. Once track condition data is continuously collected (remote monitoring), a system of smart sensors (ultrasonic, vibration, temperature, GPS), wireless communication (Wi-Fi, LoRa, 5G), and cloud-based analytics is being employed for this purpose. An AI algorithm studies collected sensor data in identifying track defects and predicting failures before sending an alert to the railway authorities for corrective actions well in time. This ensures that maintenance activities are properly scheduled for the benefit of reliability, mostly in the remote areas: a huge transformation step toward smart and safe railway infrastructure.*

Keywords: IoT, Railway Track Monitoring, Smart Sensors, Ultrasonic Sensors, Railway Safety, GPS Tracking, AI-based Analytics.

