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Predictive Vehicle Maintenance

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Abstract: *Predictive maintenance for vehicles using IoT and machine learning is a modern solution aimed at improving vehicle reliability and reducing maintenance costs. The proposed system leverages ESP32 microcontrollers connected to various sensors, including DHT11 for engine temperature monitoring, DS18B20 for battery temperature monitoring, voltage and current sensors for battery level monitoring, an ultrasonic sensor for engine oil level detection, MQ-3 for smoke level detection, and an ADXL345 accelerometer for accident detection. Data collected by these sensors is transmitted wirelessly to a laptop via a Zigbee module. The system uses machine learning algorithms to predict the vehicle's condition and sends maintenance alerts to the user through Telegram messages. This approach ensures timely maintenance, prevents unexpected breakdowns, and enhances vehicle safety and longevity*

Keywords: *Predictive maintenance*

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