

# Car Engine Performance and Life Prediction

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**Abstract:** *This research focuses on the development of a digital twin system for predicting car engine performance and remaining life using real-time data collected from an OBD2 adapter. The digital twin is a virtual model that mirrors the car engine's operational parameters such as RPM, temperature, fuel consumption, and throttle position. By analyzing this data, the digital twin provides real-time monitoring and predictive insights into engine health, allowing for predictive maintenance and life cycle estimation. The system combines Java, JavaScript, and web-based technologies for real-time visualization, along with algorithms that analyze engine performance trends to predict wear and tear. This paper discusses the implementation of the digital twin, its data flow from the OBD2 to the virtual engine model, and its potential for improving engine maintenance strategies. The system aims to reduce maintenance costs, avoid engine failures, and enhance the overall life of car engines.*

**Keywords:** Digital twin, car engine, performance prediction, life estimation, OBD2 adapter, predictive maintenance, real-time monitoring