Patent Search

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Abstract:

Parking management in urban areas faces critical challenges, including limited space, congestion caused by vehicles searching for spots, inefficient use of parking are increased fuel consumption and emissions. Traditional methods lack real-time data on parking availability and often result in suboptimal space utilization. To address issues, we propose a sensor-driven automated parking system that integrates advanced sensors such as ultrasonic, infrared, and cameras to monitor parking spaces movements in real time. A central control unit processes this data using machine learning algorithms to optimize parking efficiency, reducing search time and conges system also incorporates eco-friendly technologies, like piezoelectric materials for energy generation from vehicle movements, minimizing its environmental impact a operational costs. Additionally, a mobile app allows users to locate and reserve parking spots, while robotic controls enable autonomous parking in tighter spaces, ma capacity and improving overall urban mobility. This solution offers a smart, sustainable, and efficient approach to modern parking challenges.

Complete Specification

Description:The sensor-driven automated parking system for efficient vehicle management is designed to streamline the parking process in urban environments, addressing challenges such as limited space and traffic congestion. This system block diagram shown in Figure 1 employs an array of advanced sensors, including ultrasonic and infrared sensors, to monitor real-time parking availability and vehicle movements. Figure 2 represents the layout of EPS32 Microcontroller. By contin scanning the parking area, the system accurately detects open spaces and guides drivers to the nearest available spot, significantly reducing the time spent searchi parking. At the core of the system is a centralized control unit that manages system logic and coordinates communication between sensors, vehicles, and users. The control unit processes data from the sensors and implements machine learning algorithms to optimize parking operations, adapting to usage patterns and improvi efficiency over time. Drivers can interact with the system through a user-friendly mobile application, allowing them to locate, reserve, and navigate to parking spots In addition to its core functionalities, the system incorporates eco-friendly technologies, such as piezoelectric materials for power generation. This innovative featur enables the system to harness energy from vehicle movements, reducing its environmental footprint and operational costs. Moreover, the automated aspect of the allows vehicles to park with minimal human intervention. Once a driver exits the vehicle, the system takes over, maneuvering the car into a designated spot using r controls. This capability maximizes space utilization, enabling tighter parking configurations that traditional methods cannot achieve. Overall, the sensor-driven aut parking system represents a significant advancement in urban vehicle management, promoting efficiency, sustainability, and convenience while enhancing the over parking experience for users. , Claims:We claim that our sensor-driven automated parking system for efficient vehicle management introduces a transformative app to urban parking challenges by integrating advanced technologies and sustainable practices.

Autonomous Operation: The system operates autonomously, allowing vehicles to park with minimal human intervention, thereby streamlining the parking process

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