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Review Implementation of Smart Vehicle Parking

System

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Abstract: In today's era one of the most common problems which the world is facing is an exponential increase in population. This has indirectly increased a lot of other issues; one of them being the quantity of vehicles on the road. The increased number of vehicles results in shortage of parking areas. This project aims to present an intelligent parking system for vehicles that identifies the parking slot automatically through sensors and displays it without making the drivers to circle around the parking area.

The availability of parking slots will be displayed to the drivers at the entrance. It also captures the number plate of vehicles by using camera and recognises the number using image processing and stores it in the server at the entrance and also at the exit of parking area for ease of payment purposes. All the information's will be simultaneously updated in the IoT server and can be used for future use. It is found that the system decreases the manual work and provides high efficiency and high accuracy.

Keywords: Intelligent Parking, Data-Base, Internet Provider

I. INTRODUCTION

In past days individuals use the general public mode of transportation as Car for moving from one place to a different. But because of globalization the individuals move from geographical area to urban areas for employment and different wants the Individual transportation are improved plenty ease. Owing to this increase in vehicle the parking becomes very complicated and the people can park they're on the either sides of the roads results in heavy traffic. At present there's no systematic approach. The manual management may be enforced in many areas. The parking problem in big cities, especially the mega-cities, has become one of the key causes of the town holdup, driver frustration and air pollution. The need for parking and parking facilities is constantly on the rise. On average, 30 percent of traffic is caused by drivers wandering around parking spaces. This paper shows an intelligent and user-friendly automated parking system.

We have implemented some techniques to ensure the effortlessness of traffic at car parking zones.

This process can be done by an application with the help of Internet Application. The concept of Internet Application started with things with identity communication devices. The image may be captured and that they may be allowed to Image segmentation and edge detection through boundaries with some methodology. All the slot information is updated to server.

II. RESEARCH GAP

A significant research gap in online parking systems lies in the application of these systems in open parking lots, especially in diverse environmental conditions. While closed parking environments have seen considerable success with these systems, open parking lots pose unique challenges and opportunities that need further exploration. Additionally, there's a need for research on how to effectively integrate online parking systems with autonomous vehicles, including optimizing parking selection for large-scale autonomous drivers.

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III. PROBLEM STATEMENT

1. Inefficient Parking Search: Drivers spend significant time circling, often contributing to traffic congestion, just to find an available parking spot.

Lack of real-time information about parking availability leads to wasted time and frustration.

2. Traffic Congestion: The search for parking spaces, especially in busy areas, contributes significantly to traffic congestion.

Vehicles idling while drivers look for parking spots create unnecessary emissions and fuel consumption.

IV. OBJECTIVES

- Streamline Parking Processes: Online systems allow users to reserve parking spots in advance, eliminating the need to search for available spaces, which reduces time spent in parking lots and on the streets.
- Increase Efficiency: By automating tasks like payment and entry/exit, online systems improve the efficiency of parking operations, reducing delays and congestion.
- Reduce Traffic Congestion: Real-time availability updates and guided parking systems minimize the number of vehicles circling, leading to reduced traffic congestion and improved traffic flow.
- Improve User Experience: Online parking systems offer convenience, accessibility, and a more pleasant parking experience for drivers, making it easier to find and manage parking.
- Maximize Parking Space Utilization: By allowing users to reserve spaces in advance, online systems optimize space utilization and minimize wasted capacity.

V. SCOPE

A smart vehicle parking system can significantly expand beyond simple parking space management, influencing various aspects of urban life and contributing to a more efficient, sustainable, and user-friendly environment. It can optimize space utilization, reduce traffic congestion, enhance driver convenience, and even play a role in smart city initiatives.

Here's a more detailed look at the scope:

1. Optimized Parking Space Utilization:

Real-time availability:

Sensors and technology allow for constant monitoring of parking space occupancy, providing drivers with accurate real-time information on available spots.

Space optimization:

Algorithms can be used to dynamically allocate parking spaces based on demand and location, preventing overcrowding and maximizing space usage.

Predictive analytics:

By analyzing historical data and current trends, smart parking systems can predict future demand and optimize parking space allocation accordingly.

2. Reduced Traffic Congestion:

Reduced search time:

Drivers can locate and reserve spaces remotely, eliminating the need to spend time circling for parking, thus reducing congestion.

Optimized vehicle flow:

Smart parking systems can guide drivers to the most appropriate parking areas, minimizing unnecessary traffic and improving overall traffic flow.

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Improved traffic management:

Data collected by smart parking systems can be used to improve traffic management strategies in smart cities.

3. Enhanced Driver Convenience:

Mobile app integration:

Drivers can use mobile apps to reserve spaces, pay for parking, and receive real-time updates on parking availability.

Automated payment systems:

Integration with cashless payment systems eliminates the need for coins or paper tickets, streamlining the payment process.

User-friendly interface:

Smart parking systems can offer intuitive interfaces that make it easy for drivers to navigate and find parking.

4. Contribution to Smart City Initiatives:

Data-driven decision-making:

The data collected by smart parking systems can be used to inform decision-making related to urban planning, transportation, and infrastructure.

Improved urban mobility:

By optimizing parking and reducing traffic congestion, smart parking systems can contribute to more efficient and sustainable urban mobility.

Environmental benefits:

Reduced traffic congestion and fuel consumption associated with searching for parking can contribute to lower carbon emissions.

5. Increased Security and Safety:

License plate recognition:

Smart parking systems can utilize license plate recognition (LPR) technology to track vehicle movements and identify potential parking violations.

Real-time monitoring:

Security cameras and sensors can provide real-time monitoring of parking areas, helping to prevent theft and other security incidents.

Reduced accidents:

By reducing traffic congestion and vehicle search time, smart parking systems can also contribute to a safer environment by reducing accidents caused by distracted drivers.

In conclusion, the scope of smart vehicle parking systems extends far beyond simply managing parking spaces. They are powerful tools that can significantly enhance urban efficiency, convenience, and sustainability, playing a crucial role in the development of smart cities.

VI. RESEARCH METHODOLOGY

A comprehensive research methodology for an online parking system should encompass a combination of quantitative and qualitative approaches to thoroughly evaluate system functionality, user experience, and potential impact. This includes conducting surveys and user interviews, analyzing system data, and potentially employing simulations to model system performance.

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I. Data Collection Methods:

A. Quantitative Methods:

- Surveys: Develop structured questionnaires to gather data on user demographics, parking habits, and preferences.
- System Data Analysis: Analyze parking utilization patterns, booking rates, and user interactions within a pilot implementation or simulation.
- Simulations: Use computer simulations to model system performance under different scenarios, including varying traffic patterns and user demand.

B. Qualitative Methods:

- User Interviews: Conduct in-depth interviews with potential users and stakeholders to gather insights into their needs, expectations, and challenges.
- Focus Groups: Facilitate group discussions to explore user perspectives on the online parking system and its potential benefits.
- Observation: Observe parking behavior in target areas to understand current practices and identify potential improvement areas.

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