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|  | **Title : Smart Parking System using IOT** | | **FF No. 180** |  |
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| **Department: Computer Science** | | **Academic Year:2023-24** | | | |
| **Semester : 7th** | | **Group No. : G8** | | | |
| **Project Title: Smart Parking System using IOT** | | | | | |
| **Project Area: IOT** | | | | | |
| **Group Members Details:** | | | | | |

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| Project approved / Not approved  **Guide Project Coordinator Head of Department** |

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**Project Synopsis :** The "Smart Car Parking System using IoT" project aims to revolutionize the traditional parking management system by leveraging Internet of Things (IoT) technology. The project focuses on addressing the growing urban parking challenges, optimizing parking space utilization, and providing a seamless experience for both drivers and parking administrators.

In this project, a network of IoT devices and sensors will be strategically deployed throughout the parking facility. These devices will be equipped with various sensors such as ultrasonic, infrared, and cameras to monitor the availability of parking spaces in real- time. The data collected from these sensors will be transmitted wirelessly to a central control unit.

Key **Features of the Smart Car Parking System :**

* l-time Space Availability: The system will continuously monitor and update the status of each parking space, indicating whether it is occupied or vacant. This real-time information will be displayed on digital signage at the entrance and within the parking facility, helping drivers quickly identify available spaces.

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* Automated Payment via UPI: To enhance user convenience, the system will integrate the Unified Payments Interface (UPI) payment system, enabling users to seamlessly pay for their parking through the mobile app. Users can link their UPI-enabled bank accounts to the app, allowing for quick and secure transactions.
* Dashboard: Parking administrators will have access to a web-based dashboard that provides insights into parking occupancy, to select the parking slot timing, fine if time exceeded, This data can aid in efficient resource allocation and decision-making
* Timed Parking Slots with Dynamic Pricing:

Users can select available parking time slots through the website. Different time slots are associated with varying pricing based on demand and availability. Dynamic pricing adjusts rates in real-time based on parking demand, encouraging users to choose less busy times.

* Occupancy Detection and Prediction:

Cameras and sensors monitor parking space occupancy. Machine learning algorithms analyze historical data to predict parking space availability for different times. Users can check the likelihood of finding parking before arriving.

* Pre-Book and Pay :   
  This Feature enables users to reserve parking spaces ahead of time through the website, selecting their preferred date and time of arrival. After choosing an available slot and making an online payment, a QR code is generated for their reservation. This QR code is presented to LPR cameras at the entrance for access and at the exit for payment calculation, streamlining the parking process. Users receive an e-receipt and enjoy benefits such as guaranteed parking, time savings, and a convenient cashless payment experience.
* Security : There will be images sensors at entry point and exit point, which can be used verify that there has been no theft and vehicles are safe.
* Analytics: The collected data on parking usage patterns can be analyzed to optimize the parking layout, pricing strategies, and operational efficiency. This will contribute to better urban planning and resource management.
* Environmental Impact: By reducing the time spent circling for parking spots, the system can help reduce carbon emissions and traffic congestion in urban areas.

Overall, the Smart Car Parking System using IoT aims to streamline the parking experience for users while offering valuable insights for parking facility management. It leverages IoT technology to create a connected and intelligent parking ecosystem that benefits both individuals and communities.

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| Group No. | G8 | | |
| Activity | Review Schedule | Progress Review Report submitted | Signature of Guide |
| Review 1 | Mid Sem. Semester | Yes / No |  |
| Review 2 | End of Semester | Yes / No |  |

Format of Progress Review Report:

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| **Review No.: 1 Group No.: Date:** |
| **Progress Review Report** |
| **Signature of Guide:** |

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| **Review No.: 2 Group No.: Date:** |
| **Progress Review Report** |
| **Signature of Guide:** |