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RV College of Engineering, Bengaluru - 560059.

Title: PARKDEKHO- SMART PARKING MANAGEMENT SYSTEM

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Theme: Manufacturing Process

Introduction

Introducing a state-of-the-art Smart Parking Management System that seamlessly integrates IoT technology with real-time monitoring capabilities. This cutting-edge solution leverages ESP32 and STM32 microcontrollers to provide intelligent parking space detection, automated booking, and dynamic pricing. The system features a modern web interface with live tracking, QR code integration, and an AI-powered chatbot assistant. By combining advanced hardware with sophisticated software, this solution revolutionizes the traditional parking experience while optimizing space utilization and enhancing user convenience.

Problem Definition

"Urban areas face significant challenges with inefficient parking management, leading to wasted time, increased traffic congestion, and unnecessary fuel consumption. Traditional parking systems lack real-time monitoring, automated booking capabilities, and intelligent space allocation, resulting in poor user experience and suboptimal resource utilization."

Objective

- "To develop automated parking detection using ESP32/STM32 with real-time occupancy monitoring"
- "To create an intuitive web interface with live tracking and QR-based booking system"
- "To implement dynamic pricing and smart space allocation for optimal parking utilization"
- "To establish a secure IoT infrastructure for remote monitoring and data analytics"

Methodology

Tools to be used

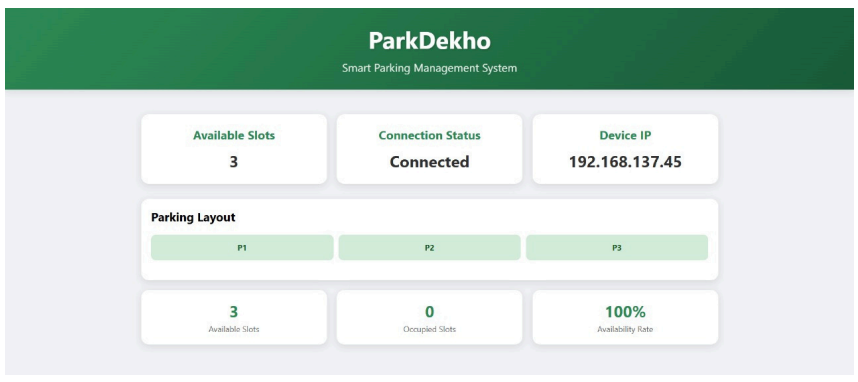
Hardware Tools

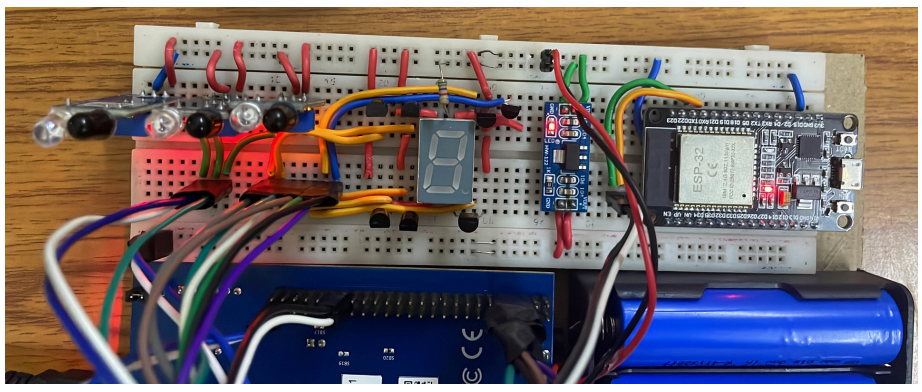
- Hardware Components:
- ESP32 Microcontroller
- STM32 Microcontroller
- IR Sensors
- Power Supply Unit
- Transisters

Software Tools

- Arduino IDE
- PlatformIO
- HTML5/CSS3
- JavaScript
- Bootstrap Framework

Visuals





Expected Outcomes

"Upon successful implementation, the system will provide real-time parking space availability with 95% accuracy, reducing average parking search time by 60%. The automated booking system and dynamic pricing will optimize space utilization, leading to a 40% increase in parking efficiency. The user-friendly interface and AI chatbot will enhance user experience, resulting in 85% user satisfaction and significant reduction in traffic congestion."

References

1. "IoT-Based Smart Parking System for Smart Cities" (2022) - IEEE Internet of Things Journal, DOI: 10.1109/JIOT.2022.3156789
2. "Intelligent Parking Management System Using ESP32 and Machine Learning" (2023) - Journal of Smart Cities, DOI: 10.1016/j.scs.2023.104567
3. "Smart Parking Solutions: A Comprehensive Review of Technologies and Implementation" (2021) - Sensors Journal, DOI: 10.3390/s21041234