IOT BASED SMART CAR PARKING SYSTEM

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Motivation/Introduction:

This initiative addresses urban parking challenges by employing an IoT-driven smart system. Sensors installed in parking spaces detect vacancies in real-time, relaying data to a central hub. This data is then accessible via a user-friendly mobile app, directing drivers to available spots and minimizing the congestion caused by endless circling. Moreover, the system ensures efficiency by managing access through secure barriers, allowing only authorized vehicles to utilize designated spaces. This not only alleviates frustration for legitimate parkers but also yields valuable insights into parking patterns. Urban planners can leverage this data to optimize parking infrastructure and devise strategies for future needs. Ultimately, this smart parking system aims to reduce driver stress, decrease environmental impact, enhance traffic flow, and inform future urban development endeavours.

Scope of the Project:

The project's main objective is to create an IoT-powered smart parking system. This involves installing sensors in parking spaces for occupancy detection, establishing a central database for real-time data storage, and crafting a user-friendly mobile app for availability display. Additionally, a secure barrier system will be deployed to regulate access and ensure only authorized vehicles use designated spots. Key functionalities such as real-time app updates, navigation to available spaces, secure entry/exit, and data gathering for future planning will be emphasized. While this summary provides a broad overview, a more detailed scope would include specifics on system integration, security protocols, and mobile app interface design.

Methodology:

1. Sensors (IR and ultrasonic) detect the presence or absence of the vehicles in parking spaces.

2. Sensor data is sent to the microcontroller, which processes it and determines the slot status (occupied/free).

3. The microcontroller transmits this data via Bluetooth through the HC-05 module.

4. The mobile app receives the data and updates the database with the real-time parking slot information.

5. The app displays the updated parking status on the user interface, guiding drivers to available slots.

6. The servo motor can be used with the data to create physical barriers indicating free/occupied slots.

Fig1: Block Diagram:

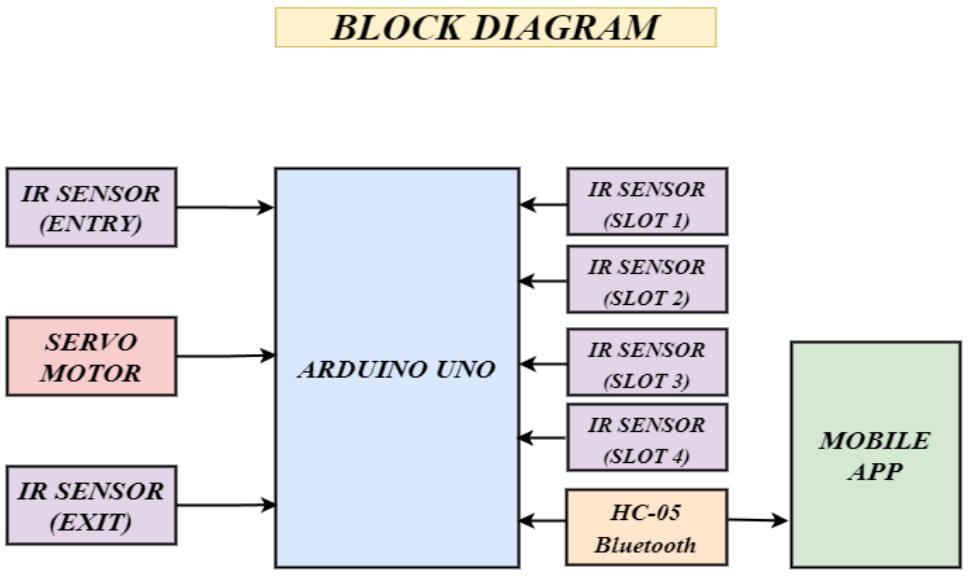
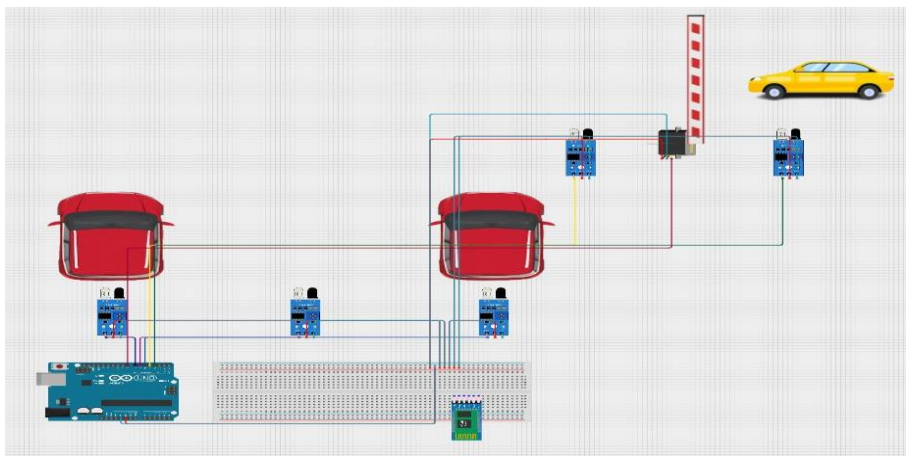


Fig2: Circuit Diagram



Experimental Result:

Conclusion/Summary:

In conclusion, the implementation of this IoT-driven smart parking system offers a promising solution to alleviate urban parking challenges. By harnessing the power of real-time data and user-friendly technology, the system effectively guides drivers to available parking spaces, reducing congestion, fuel wastage, and driver stress. Moreover, its secure barrier system ensures efficient utilization of designated spots, enhancing overall parking management. The system's capability to collect valuable data for future planning further underscores its significance in optimizing urban infrastructure and fostering sustainable development. Ultimately, this innovative approach not only addresses immediate parking issues but also paves the way for smarter, more efficient urban mobility solutions.

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