GNANAMANI COLLEGE OF TECHNOLOGY(Pachal,Namakkal.)

DEPARTMENT OF BIO MEDICAL

ENGINEERING

(Third Year)

**Title**: **Smart parking**

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SMART PARKING

**PROBLEM :**

Difficulty in Accurate parking Space Detection-One common challenge in smart parkingSystems is accurately detecting whether a parking space is occupied or vacind in accutare detection can lead to confusion and insufficiency

**KEYWORDS:**

1)Internet of things

2)Smart city

3) Messaging protocols

4)Standerdization

5)Introperability

6)Protuct life cycle management

**INTRODUCTION:**

**\* .** An IOT based parking system is a vechile parking management system to is the search for the vacant parking spot in a parking lot through a smart phone.

\*. The system utilizes various sensors and microcontrollers with internet capability for decting parked vechiles and to uptate the data in real time on internet .

**DESIGN OF SMART PARKING:**

**\*.** As Mentioned above the proposed smart parking lot circuit will be equipped

With several sensors

\*. Inexpensive microcontrollers and wifi module using which a car/any vechile won car check if there is a vacant space in a parking lot using his /her phone or tabelet or even on computer.

**DATA FUSION:**

Compain data from multiple sensor to increase accuracy for example,you can use both infrared and ultra sonicsensors in tandem by cross referencing their

Data can reduce false readings .

**MACHINE LEARNING:**

**\***.Implement machine learning algorithms to analog sensor data

\*.Machine learning can help in fine tuning occupancy detection by accounting for various factors like sesor noise lighting conditions and environmentalChanges.

**REAL TIME UPDATES:**

\*. Connect the sensor data to a central system or a mobile app that provides

Realtime updates to users

\*.Indicating available parking space this ensures that drivers are directed to the nearest vacant spot

**MAINTENANCE AND CALIBRATION:**

\*.Regularly maintain and calibration the sensors to ensure their accuracy over time . this includes checking for sensor malfunctions or obstructions

\*.By addressing the accuracy of parking space detection through IOT Sensors

And data processing.you can improve the efficiency and user experience of your

SMART PARKING PROJECT.

**SOFTWARE :**

Software used for arduino based smart parking system project is arduino IDE

**ARDUINO IDE:**

This is the primary software for programming Arduino boards you can downloade it from the official arduino web site.

PHASE-2

INNOVATION

**1. \*\*IoT Connectivity:\*\***

- Utilize IoT modules (such as ESP8266 or ESP32) with Arduino to connect the system to the internet.

- Enable bidirectional communication, allowing the system to send data to the cloud and receive commands or updates.

**2. \*\*Soil Moisture Sensing:\*\***

- Implement soil moisture sensors in key locations to measure the moisture content of the soil.

- Use capacitive soil moisture sensors for accurate readings, and calibrate them to specific soil types.

**3. \*\*Data Transmission:\*\***

- Establish a secure connection to an IoT platform (like ThingSpeak, Blynk, or AWS IoT) to transmit real-time data.

- Ensure data encryption for privacy and security.

**4. \*\*Cloud-Based Analytics:\*\***

- Implement cloud-based analytics to process and analyze the collected data.

- Utilize machine learning algorithms to predict future soil moisture levels based on historical data, weather forecasts, and other relevant parameters.

**5. \*\*Mobile Application:\*\***

- Develop a user-friendly mobile app for farmers or users to monitor and control the system remotely.

- Include features such as real-time soil moisture levels, historical data graphs, and the ability to adjust irrigation settings.

**6. \*\*Automated Irrigation Control:\*\***

- Implement an automated irrigation system that adjusts water flow based on real-time sensor data.

- Include features like scheduling, threshold alerts, and emergency shutdown in case of sensor malfunctions or extreme conditions.

**7. \*\*Energy Efficiency:\*\***

- Design the system to be energy-efficient by using low-power components and optimizing the communication protocols.

8**. \*\*Scalability:\*\***

- Ensure that the system is scalable, allowing users to expand the coverage area or add more sensors as needed.

**9. \*\*Weather Integration:\*\***

- Integrate weather APIs to incorporate forecast data into the decision-making process.

- Adjust irrigation schedules based on upcoming weather conditions to avoid unnecessary watering during or after rainfall.

**10. \*\*Community and Data Sharing:\*\***

- Allow for community-based data sharing where users can contribute anonymized data for broader analysis.

- Promote a collaborative approach to water management, especially in regions facing water scarcity.