SMART PARKING NOTIFICATION

Overview

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Introduction

- A major problem in day to day life is traffic congestion.
- This project work presents the basic concept of using server or cloud based smart parking services in smart cities.
- Internet of things (IoT) serves as a catalyst for this smart parking system.
- The focus and objective of this project work lies on mono-parking management architectural system which works on real-time basis

Embedded System



- A computer system with a dedicated function within a larger mechanical or electrical system, often with real-time computing constraints
- Modern embedded systems are often based on microcontrollers (i.e. CPUs with integrated memory or peripheral interfaces).
- A common standard class of dedicated processors is the digital signal processor (DSP).

IoT Disciplinary Fields



IoT Protocol Stack



MQTT – MQ Telemetry Transport

- A light weight message queuing and transport protocol.
- Suited for M2M (Mobile to Mobile), WSN (Wireless Sensor Networks) and ultimately IoT scenarios where sensor and actor nodes communicate with applications through the MQTT message broker.



Block diagram



Hardware Requirements

- Arduino UNO
- IR Sensor
- Current Amplifier
- WeMos D1
- 16x2 LCD
- Power Supply

Arduino UNO

- Microcontroller board based on the ATmega328P.
- 14 digital input/output pins (of which 6 can be used as PWM outputs)
- 6 analog inputs.
- 16 MHz quartz crystal
- A power jack
- Connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

The board...



Infra Red (IR) Sensor

• Operating Voltage: 5V



- Mode selection Configurable High / Low Output State (Using AH and AL pins)
- Adjustable Range using preset (potentiometer on board)
- Useful for various Robotic Applications, Room Visitor Counter Systems, etc

Current Amplifier

• Current amplifier supplies the succeeding stage with a current that is a fixed multiple of the input current.



WeMos D1

• An Arduino UNO Compatible WiFi board based on ESP8266EX.

Features

- 11 digital input/output pir
- 1 analog input(3.2V max)
- Micro USB connection
- 9-24V power input.
- Compatible with Arduino
- Compatible with node mcu



Liquid Crystal Display (LCD)

- LCD screen is an electronic display module.
- Most common LCDs connected to the microcontrollers are 16x2 and 20x4 displays.
- A 16x2 LCD means it can display 16 characters per line and there are 2 such lines.
- Each character is displayed in 5x7 pixel matrix.
- 16x2 LCD has two registers, Command and Data.



Pin Diagram



Why LCD??

- LCDs are,
- ➢ economical
- easily programmable
- have no limitation of displaying

Power Supply





Software Used..

- Arduino IDE
- Eclipse Android SDK(Software Development Kit)

Programming Languages Used..

- Embedded C/C++
- Java & XML

ANDROID APP 'MQTT DASHBOARD'

MQTT Dashboard			
Host test.mosquitto.org	Port 1883	Торю	CONNECT
SHOW DEMO HELP			
NOTE: Wildcard topics and topics with anything else than number	output are not supported		
Click on topic suggestions to fill them in the form: bjaanes/mock/home/temperature bjaanes/mock/street/car-speed bjaanes/mock/random10k			
	bjaanes/mock/home	/temperature	



bjaanes/mock/street/car-speed

General Architecture



Advantages

- Optimized parking.
- Reduced traffic.
- Reduced pollution.
- Enhanced user experience.
- New revenue streams.
- Increased safety.
- Real time data and trend insight.
- Decreased management cost.
- Increased service and brand image.

Future Scope

- Smart car parking system with automatic billing system.
- Safety measures such as vehicle number tracing, driver face-recognition can be introduced .

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