

# SMART CAR PARKING SYSTEM USING INTERNET OF THINGS

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**Abstract:** With the rapid proliferation of vehicles availability and usage in recent years, finding a vacant parking space is becoming more and more difficult, resulting in a number of practical conflicts. This is about creating a reliable system that takes over the task of identifying free slots in a parking area and keeping the record of vehicles parked very accurately. This project reduces human effort at the parking area to great extent such as in case of searching of free slots by driver and calculating the payment for each vehicle using parking area. The various steps involved in this operation are vehicle identification, free slot detection and payment calculation. Vehicle identification is carried out using RFID, free slot detection is carried out using display and payment calculation is done based on period of parking.

**Key words:** Internet of things

## 1.INTRODUCTION

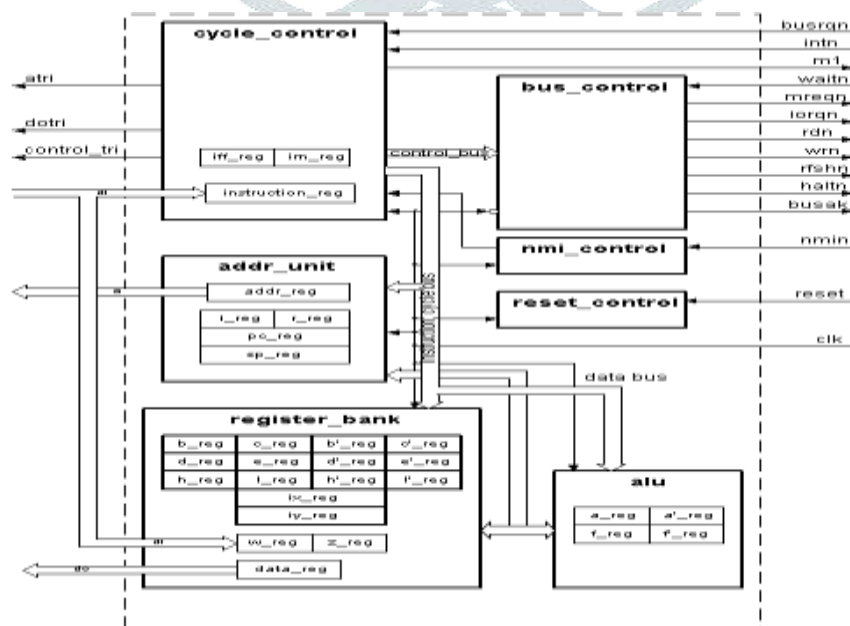
The internet of things says is that the scope of this internet is going to be expanded. So, it is going to be expanded beyond computing and computer devices being connected. Each and everything that we see around us that we use at our home in businesses, in workplaces, everything being internet worked. So, this is the whole vision of internet work of things, internet of things.

Car parking problem is a major contributor and has been, still a major problem with increasing vehicle size in the luxurious segment and confined parking spaces in urban cities. Searching for a parking space is a routine activity for many people in cities around the world. Smart Parking systems typically obtains information about available parking spaces in a particular geographic area and process is real-time to place vehicles at available positions. It involves using low-cost sensors, real-time data collection, and mobile-phone-enabled automated payment systems.

### 1.1 MICROPROCESSOR

A microprocessor as a term has come to be known is a general-purpose digital computer central processing unit. Although popularly known as a computer on a chip. The microprocessor contains arithmetic and logic unit, program counter, Stack pointer, some working registers, clock timing circuit and interrupt circuits. To make a complete computer one must add memory usually RAM & ROM, memory decoders, an oscillator and number of I/O devices such as parallel and serial data ports in addition special purpose devices such as interrupt handlers and counters.

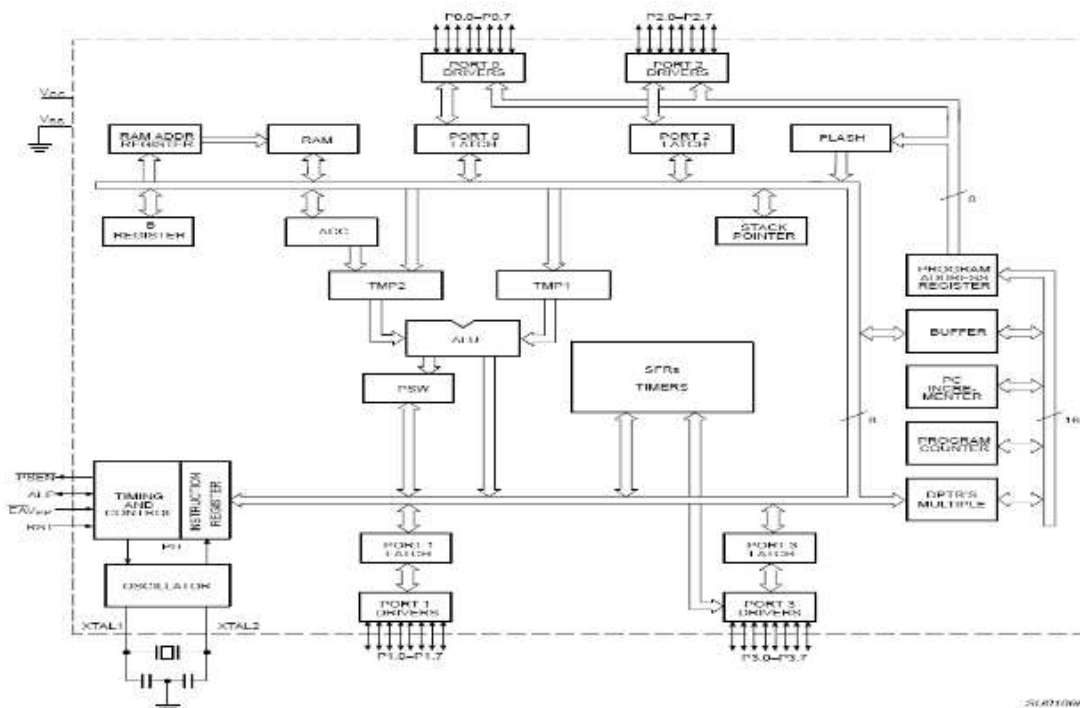
#### BLOCKDIAGRAM OF MICROPROCESSOR



## 1.2 MICROCONTROLLER

Micro controller is a true computer on a chip the design incorporates all of the features found in a microprocessor CPU: arithmetic and logic unit, stack pointer, program counter and registers. It has also had added additional features like RAM, ROM, serial I/O, counters and clock circuit. The design approach of a microcontroller uses a more limited set of single byte and double byte instructions that are used to move code and data from internal memory to ALU. Many instructions are coupled with pins on the IC package; the pins are capable of having several different functions depending on the wishes of the programmer.

### BLOCK DIAGRAM OF MICROCONTROLLER



## 1.3 WIFI MODULE

Technology When you use USB as a power source, and to provide protection for your USB port, there is a PTC (positive temperature coefficient) fuse (MF-MSMF050-2) in series with the USBVCC. This provides protection from overcurrent, 500mA. When an overcurrent limit is reached, the PTC resistance increases a lot. Resistance decreases after the overcurrent is removed.



The ESP8266 arduino compatible module is a low-cost Wi-Fi chip with **full TCP/IP capability**, and the amazing thing is that this little board has a **MCU (Micro Controller Unit) integrated** which gives the possibility to **control I/O digital pins** via simple and almost pseudo-code like programming language. This device is produced by Shanghai-based Chinese manufacturer, **Espressif Systems**.

### ESP8266-01 Technical specifications

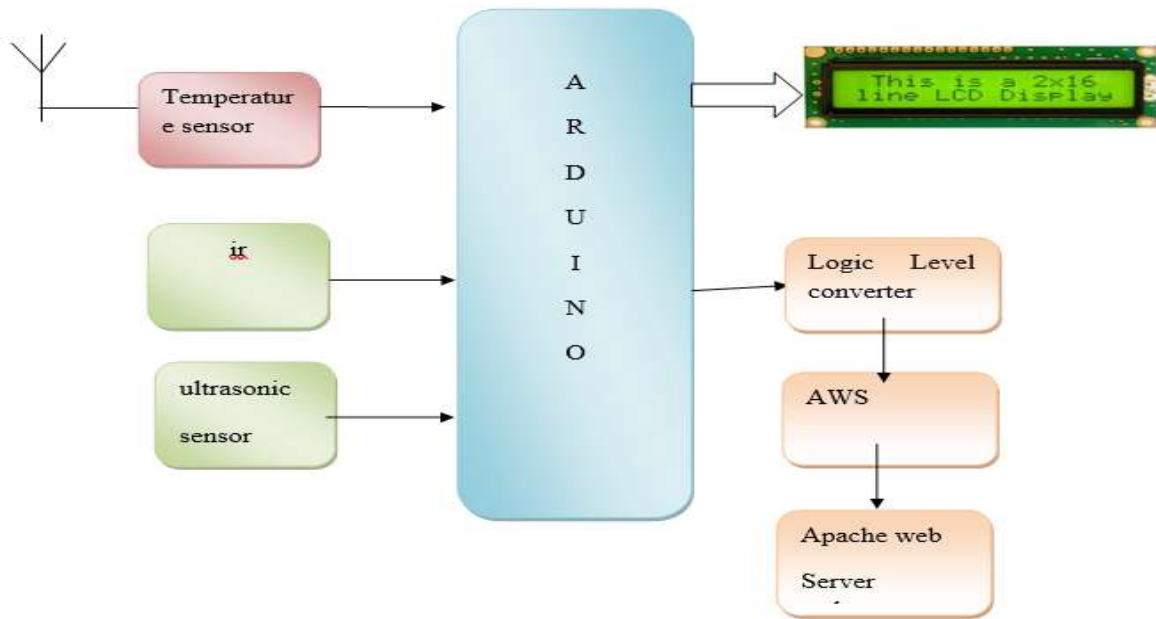
- 32-bit RISC CPU: Tensilica Xtensa LX106 running at 80 MHz \*\*
- 64 KiB of instruction RAM, 96 KiB of data RAM
- External QSPI flash – 512 KiB to 4 MiB\* (up to 16 MiB is supported)
- IEEE 802.11 b/g/n Wi-Fi
- Integrated TR switch, balun, LNA, power amplifier and matching network
- WEP or WPA/WPA2 authentication, or open networks
- 16 GPIO pins

- SPI, I<sup>2</sup>C,
- I<sup>2</sup>S interfaces with DMA (sharing pins with GPIO)

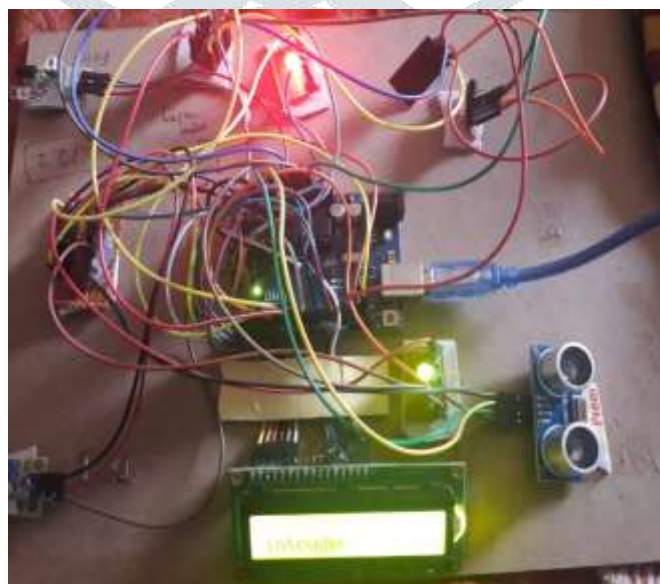
**2. PROPOSED SYSTEM**

Smart Parking System is very important in aspect to avoid much human efforts, this system is completely based on an Arduino and esp8266 Processor, and we are developing a web application in PHP. whenever any person want to park his vehicle in park area then have to open his web application it will shows free parking slots, at that place vehicle identification is done by RFID sensors and id is generated for that user ,when a user park his vehicle on parking slot then IR sensor is detected and whenever he leaves that slot that time for that id payable amount is generated ,whenever next time that person will park his vehicle on any slot that time only a amount is updated for that id. It will be possible for 5 times, after that time user have to pay a parking amount online ,suppose any person not payed amount and if he will go for parking his vehicle that time the buzzer will generate an alarm and it sends a message to authorized person.in this payment for parking is also calculated by Arduino.

**BLOCK DIAGRAM**



**3. RESULT**



The result discuss that the arduino consists of the temperature sensor, IR sensor and an ultra-sonic sensor is connected to the arduino and then to the logic converter to the AWS server to which it store the data the in the cloud.



The result discuss that the if a visitor wants to park his car the visitor will book the slot from the mobile application and books the slot and enters to parking area with sensor and gives the slot to park the car where it is availability.



The result discuss that the visitor 1 wants to park his car the visitor will book the slot from the mobile application and books the slot and enters the parking area by paying to some amount to an hour the process will continue to till there a space.



The result discusses that the visitor 1 who parks in the particular parking slot area wants to leave the parking place. While the visitor 1 will leaving the parking slot the IR sensor will give intruder ultrasonic sound the visitor is leaving the parking place and the slot is available to another visitor.

#### 4. CONCLUSION

The concept of smart cities has always been a dream for humanity. Since the past couple of years large advantages have been made in making smart cities a reality. The growth of internet of things and cloud technologies have give rise to new possibilities in term of smart cities. Smart parking facilities and traffic management systems have always been at the core of constructing smart cities.

The system that we proposed real time information regarding availability of parking slots in a parking area. User from remote locations could book a parking slot for them by the use of our mobile application.

#### 5. FUTURE SCOPE

- Smart parking will help in the efficient management of parking in an area and will avoid spill-over parking. Various technological options are available to meet parking demands, regarding from conventional ramp type to fully auto made type, the policy says.

- It recommends that parking fees collected should be utilized for building infrastructure, devising methods and strategies for parking management as well as financing and upgrading various mass public transit modes.
- The policy proposed to encourage sharing of facilities and introduction of the transfer of development rights., tax subsidies, and capital subsidy, if needed. As a policy to eventually free up space allocated to parking, levy of user fees or impact fee has been recommended for parking on roads and public spaces.

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