Intelligent Parking Based on Geolocation Using IoT

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Abstract

The project "Intelligent parking based on geolocations using IoT" is aimed to guide people around the city and make them aware of the parking restrictions using Internet of Things. Every person who owns a vehicle has been ticketed at least once due to parking issues. Nowadays every vehicle equipped with GPS technology and smart gadgets, but it miserably fails to avoid parking issues. Thus, we are creating a cloud enabled backend service for the city traffic controller to create Geolocation using polygons which will be sending true or false whether the point asked for resides within the polygon.

Index Terms- Arduino MEGA; Buzzer; Geolocations; Mongo DB; PHP; Sensor.

1 INTRODUCTION

It's a problem in big cities to get parking: searching for a vacant parking space takes a long time. Car parks are often full during term time though many vehicles do not have parking permits. There is no deterrent to unauthorized parking in unmarked or reserved bays. The car park management system will enable us to make more efficient use of available spaces by controlling vehicle access at key entrances. It will also provide a means of enforcing parking policy, by issuing warning notices and fines to people parking illegally. To build a smart parking system it is necessary to have some sensors that can be applied to a system. We know the parking can be an issue for people. That's why we are planning to introduce a park management system to more effectively control parking and enhance the environment for everyone. Every person who owns a vehicle has been ticketed at least once due to parking issues. Nowadays every vehicle equipped with GPS technology and smart gadgets, but it miserably fails to avoid parking issues. Thus, we are creating a cloud enabled backend service for the city traffic controller to create Geolocation using polygons which will be sending true or false whether the point asked for resides within the polygon. The embedded device inside the vehicle is constantly sending its data during tracking, which we are utilizing to query a geospatial command when the speed decreases to a stationary point and reply back whether it is safe to park or not.

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2 LITERATURE SURVEY

Literature survey is an important step in software development process. In various referred papers, authors have discussed about different factors that affect the parking process, methods used to enhance parking system, techniques used in tracking and parking. The papers suggest that various protocols, techniques that can be used to overcome drawbacks of the existing system.

2.1 A Cloud-Based Intelligent Car Parking Services for Smart Cities

This paper presents the generic concept of using cloud-based intelligent car parking services in smart cities, as an important application deployed on the Internet of Things (IoT) paradigm. The corresponding IoT sub-system includes sensor layer, communication layer, and application layer. A high-level view of the system architecture is outlined. To demonstrate the provision of car parking services with the proposed platform, a cloud-based intelligent car parking system for use within a University campus is described along with details ofdesign and implementation.

2.2 MQTT protocol

Message queuing telemetric transport is a publish subscribe based messaging protocol. TCP and UDP protocols are used for IOT appliances. There are various other protocols XMPP, DDS, AMQP used to handle various issues. It represents M2M protocol. MQTT protocol has several benefits like increased scalability, reduction in bandwidth consumption, efficient distribution of information. This protocol connects devices and network with middleware and applications. The default port where it works is on TCP/IP port. The various types of MQTT are hivemq, pahoMQTT. It is most widely used connection protocol for M2M and IOT [8][20].

2.3 CVMS: Cloud Based Vehicle Monitoring System in VANETs:

Integration of Cloud computing with VANET is supposed to be the next big thing because of its scalability and reliability. In vehicular ad hoc networks (VANETs) the network services and applications (e.g., safety messages, vehicle navigation data) require an exchange of vehicle and event location information. This paper proposes a new VANET-Cloud integrated service called CVMS: (Cloud Based Vehicle Monitoring System in VANETs) as service in which, vehicles moving on the road serve as witnesses of designated events, capture the real time video or photo of specific location, route or a deadly accident. A group of vehicles with mounted on-board navigation units collaborate to form the vehicular cloud and sends the real time data to central cloud using roadside cloud. The proposed real time cloud-based video capture system has been experimented with various scenarios of video based road services. The algorithm for efficient lane changing, navigation data transferring from vehicular cloud to the central cloud in a real time environment has been implemented on a simulator of an on-board camera based embedded system. The goal of this service is to recognize and track faulty vehicle, emergency vehicles, video and photo capturing of any event, route or location. The

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presented work demonstrates the potential of our proposed system for enhancing and diversifying real-time video services in road environments.

3 PROPOSED METHOD

We are creating a cloud enabled backend service for the city traffic controller to create Geolocation using polygons which will sending true or false whether the point asked for resides within the polygon. In our project we are using five components GPS, MCU, Sensor, Buzzer, Sim800. GTO P019 is the GPS used. GPS is used for tracking locations. The microcontroller used is Arduino Mega. Arduino consists of printed circuit board and a piece of software or IDE(Integrated development environment) that runs on your computer to write and upload computer code to the physical board.The sensor is used in the form of a switch, it triggers when vehicles goes from on state to off state.Buzzer sends alert messages like whether the vehicle is parked at a parking zone or not. Sim800 is used to get latitude and longitude.

4 DESIGN

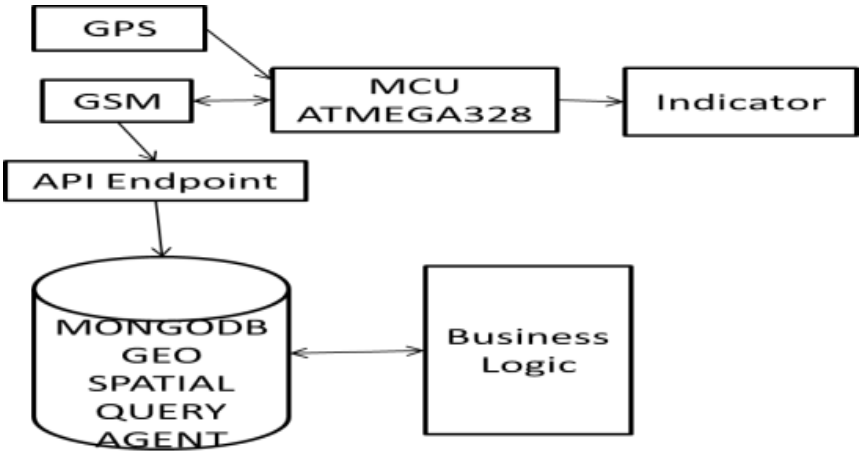

fig: Block Diagram

The main components are Server, Client and Admin Front End. For the Admin to work we need a web server. Mongo DB is used to run the spatial queries and it is also easy to work with and supports multiple arrays. Business logic holds the logic that is coded. Arduino Mega is chosen as GSM and GPS works as UART port. JSON is a data interchange format which is easy for machines to parse and generate.

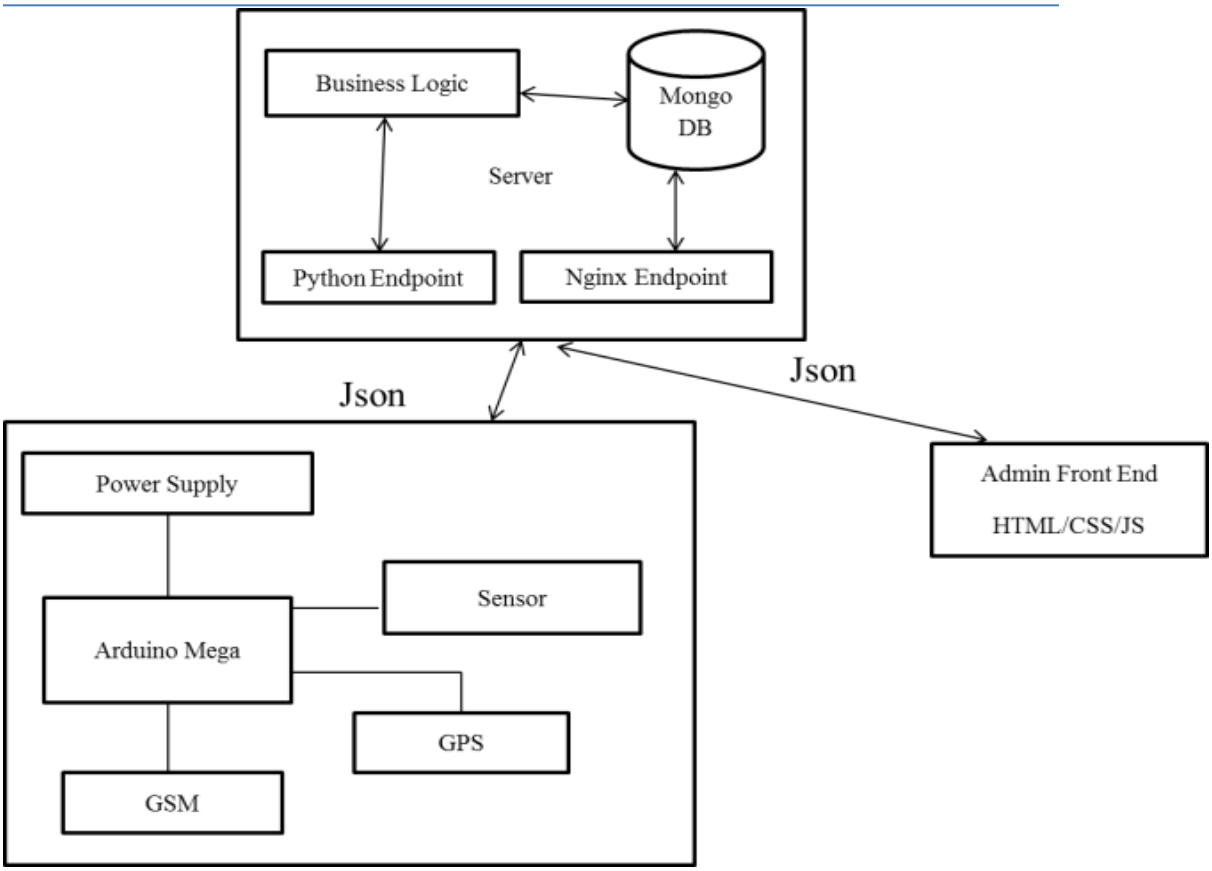

fig: System Architecture

5 CONCLUSION

The project "Intelligent parking based on geolocations using IoT" is aimed to guide people around the city and make them aware of the parking restrictions using Internet of Things. The park management system will enable us to make more efficient use of available spaces by controlling vehicle access at key entrances. It will also provide a means of enforcing parking policy, by issuing warning notices and fines to people parking illegally. Our project will check whether a vehicle is in parking or no parking area. If it is in the no parking buzzer will beep and a notification will be sent to the admin.

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