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MC BASED SMART HOME AND VEHICLE CONNECTIVITY

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ABSTRACT

The Internet of Things (IoT) is a development of the worldwide web in Which everyday objects have network connectivity, allowing them to Send and receive data. The IoT becomes a Smart network of devices, vehicles, Buildings, and even people embedded with electronics, software, sensors/ Actuators, and network connectivity to enable these objects to collect and Exchange data. In the proposed system we present the intelligent monitoring and management home and vehicle with IoT. Here the home and vehicle are the things of IoT and they will upload the corresponding sensor information to the IoT cloud, from wher the information will be shared with connected vehicles and persons. In the proposed system also designed android application to monitor the home and vehicle.

1. INTRODUCTION

Today smart grid, smart homes, smart water networks, intelligent transportation, are infrastructure systems that connect our world more than we ever thought possible. The common vision of such systems is usually associated with one single concept, the internet of things (IoT)[1][10], where through the use of sensors, the entire physical infrastructure is closely coupled with information and communication technologies; where intelligent monitoring and management can be achieved via the usage of networked embedded devices. In such a sophisticated dynamic system, devices are interconnected to transmit useful measurement information and control instructions via distributed sensor networks.

Today sensors are everywhere. We take it for granted, but there are sensors in our vehicles, in our smart phones, in factories controlling CO2 emissions, and even in the ground monitoring soil conditions in vineyards. While it seems that sensors have been around for a while, research on wireless sensor networks (WSNs) started back in the 1980s, and it is only since 2001 that WSNs generated an

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increased interest from industrial and research perspectives. This is due to the availability of inexpensive, low powered miniature components like processors, radios and sensors that were often integrated on a single chip (system on a chip (SOC).

The idea of Internet of things (IOT) was developed in parallel to WSNs. The term internet of things was devised by Kevin Ashton in 1999 [1] and refers to uniquely identifiable objects and their virtual representations in an "internet-like" structure. These objects can be anything from large buildings, industrial plants, planes, cars, machines, any kind of goods, specific parts of a larger system to human beings, animals and plants and even specific body parts of them. While IOT does not assume a specific communication technology, wireless communication technologies will play a major role, and in particular, WSNs will proliferate many applications and many industries. The small, rugged, inexpensive and low powered WSN sensors will bring the IOT to even the smallest objects installed in any kind of environment, at reasonable costs

Integration of these objects into IOT will be a major evolution of WSNs.

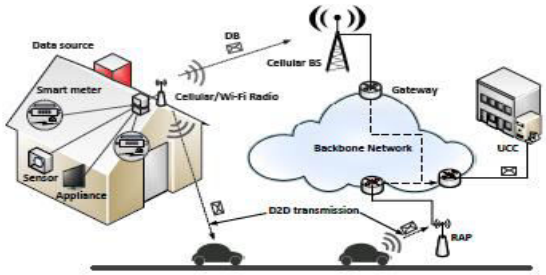

Fig1.1 IOT connected home and vehicles

In this proposed system as shown in fig 1.1 the use and evolution of WSNs within the wider context of IOT for home and vehicles is discussed and provides a review of WSN applications, while also focussing the attention on infrastructure technologies, applications and standard features in WSN designs.

2. RELATED WORK

This section presents the most relevant work to the proposed system. As it will be evidenced throughout this system, my work provides analytical and experimental evaluation of the proposed system's performance, where as most of the works discussed in the literature only suggest proposed designs without supplying performance results. Moreover, compared to other similar systems, our system is more complete in that it describes and analysis the overall system and its interactions. In[4][8] a novel framework for vehicle social networks with a dynamic trust capability that aims to minimize the impact of malicious behaviour in the social network.

In[3] proposed a framework,*VeDi*, for vehicular crowd sourced video social network over VANETs. In the proposed work, vehicles share metadata based description of videos that are captured by the occupants of the vehicle and are accessible to surrounding vehicles.

In[5][6] it defines important components, their interactions, and inter-relations, which are inspired from the structure of SIOT. A structure of interaction message is provided which adopts DSRC standards that can support various applications such as safety, efficiency and infotainment.

The novel concept of Social Internet of Things (SIOT), based on a sort of social relationship among objects, analogously to what happens for human beings[6].

Using Road Speak framework different people traveling along the same roadways at the same time can form virtual mobile communities. They present the design of Road Speak, an inter vehicle voice chat system that allows users to automatically join Voice Chat Groups along these roadways [11].

"Towards the implementation of IOT for environmental condition monitoring in homes"(Kelly, Sean Dieter Tebje, Nagender Kumar Suryadevara, and Subhas Chandra Mukhopadhyay.) In this paper, we have reported an effective implementation for Internet of Things used for monitoring regular domestic conditions by means of low cost ubiquitous sensing system.[2]

"Security Architecture of the Internet of Things Oriented to Perceptual Layer". (Zhang, Weizhe, and Baosheng Qu) .The Internet of Things (IOT) is omnipresent Internet-based network. However, the IoT exhibits characteristics that pose considerable risks: heterogeneity, inherent openness, and terminal vulnerability.[3]

3. PROPOSED SYSTEM

The proposed system introduces a Intelligent Home and Vehicular network, where each vehicle is a sender, a receiver and a router at the same time, which is the main reason that it can broadcast the information to the IOT, which uses this information to provide these instruction to the drivers, and information to the parents. This information is quite important because most of the services that are available in a IOT and also the system provides the home information through IOT which is required for smart home automation.

A low cost and efficient smart home and vehicular system is presented in our

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design. This system has two main sections as shown in fig 1.1.

1. Home section
2. Vehicle section

3.1 Home Section

As we can see in figure 1.2, the smart home system offers feature such as monitoring the temperature sensor. It also offers switching functionalities to control fan connected to the relay system and all these can be monitored from the Android smart phone app or web application. This section consists of Arduino uno as processing unit and LM35 for sensing temperature, relay for switching the fan and

ESP8266 wifi module for uploading the information to cloud.

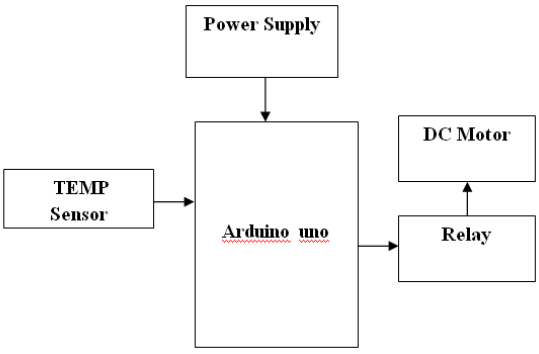

Fig 3.1:BlockDiagram of Home Section

In the proposed system vehicle section consists of sensors to detect fire accidents and collisions, and ARM7 (LPC2148) microcontroller to process the sensor data and wifi module to upload the information to IOT cloud

3.2 Vehicle section

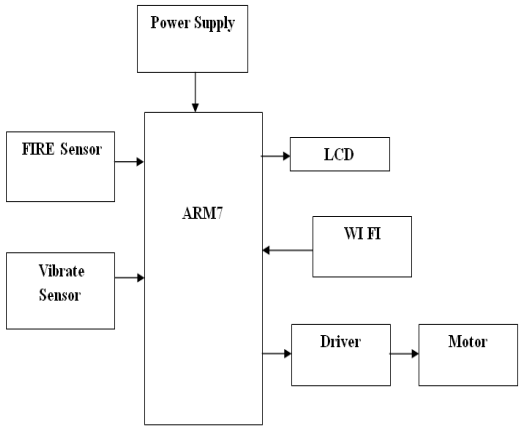

Fig3.2 :Block Diagram of Vehicle Section

Fig3.3 :Monitoring Section

4. Hardware Requirements:

- ARM7 (LPC2148)
- ARDUINO UNO
- RELAY
- LCD
- Wifi module
- BUZZER
- Vibration sensor
- Temperature sensor
- Dc motor

5. SOFTWARE REQUIREMENT

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- Keil µ Vision4 Software
- The Arduino IDE
- Proteus:
- FLASHMAZIC

6. RESULT ANALYSIS

The proposed system was fully developed and tested to demonstrate its feasibility and effectiveness. The screenshots of the smart home app developed has been presented in Figure below.

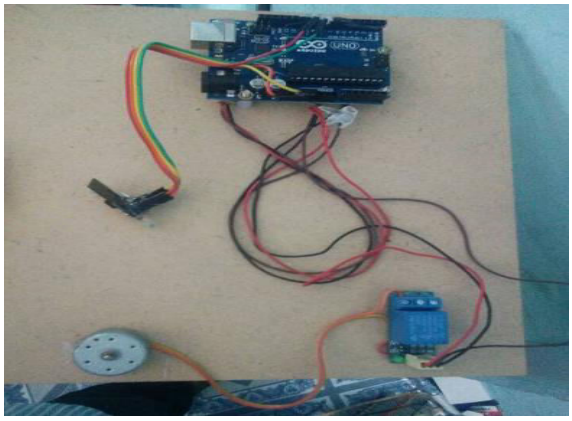

Fig6.1(a) Home section

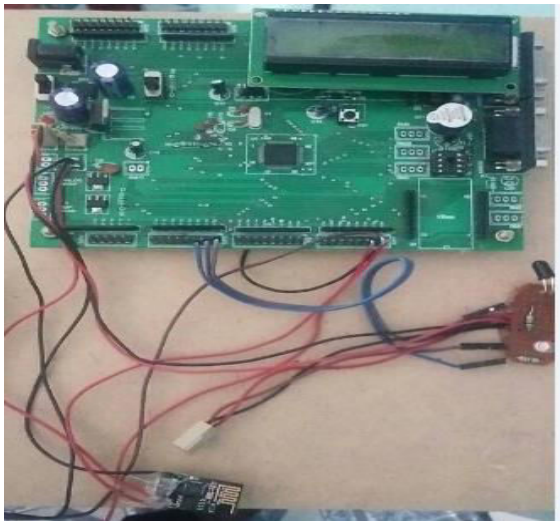

Fig6.1(a) Vehicle section

7. CONCLUSION

Using different approaches we can reduce the emergency services arrival time when an accident occurs, trying to avoid traffic jams that could result from this particular situation. Moreover, we can conclude that traffic density is a key factor to distribute traffic in an efficient manner. Proposal of a method that allows estimating the vehicular density in urban environments at any given time by using the communication capabilities between vehicles. And also monitoring the vehicle status and home parameters from single application. Which will become a user friendly and efficient.

Future works can be done on increase this smart grid model by including industries , farms and etc along with home and vehicles for energy saving ,automation, etc and thus make a more intelligent system. It also stores the sensor parameters in the database (webpage) in a timely manner. This will help the user to observe the condition of various parameters anywhere anytime.

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