International Journal of Scientific Research & Engineering Trends
Volume 5, Issue4, July-Aug-2019, ISSN (Online): 2395-566X

# Classifying Vehicle Activity Patterns from IOT Device: A Survey

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***Abstract*** **- In this work, the Internet of Things Technology can greatly enhance the performance, monitoring and maintenance of the vehicle. In this paper analysis is based on the Implementation of new cost effective methodology based on IoT to monitor vehicle health remotely for performance evaluation. Information from the sensors is transmitted via the mobile radio network. The vehicle consist of onboard GPRS module which collect the CAN data from the CAN device fitted on the vehicle and send it to the remotely located server. Second phase work focus on Monitoring the temperature of the vehicle system avoid sparking of the vehicle and also providing the fuel consumption & Battery information of display and third phase of implementation using of GSM Module when vehicle is provide the unusual activity & driver is facing any problem then it give message to the owner of vehicle. This will facilitate preventive maintenance, fault detection, historical analysis of the vehicle in addition to real time monitoring. In this paper we analysis the different vehicle parameters via remote monitoring system.**

***Keywords-*** IoT (Internet of thing), GPS/GSM/GPRS, CAN (Controller Area Network), Sensor.

## I. INTRODUCTION

Mobile data systems are getting cheaper and more widespread each year. People are staying online longer than before, which opens up tremendous possibilities for projects related to the Internet of Things (IoT) [1]. Around 47% of the world's population is already using the Internet [2] and by 2020 it is foreseen that the number of devices connected to the Internet will be over 50 billion [3].

As wireless network technologies going one step ahead day by day, internet-connected mobile devices such as smart phones and tablets are now in widespread use. Thus resulting in a new concept, Internet of Things (IoT), was introduced and has received attention over the past few years. IoT represents a system which consist a thing in the real world, and sensors attached to or combined to these things, connected to the Internet via wired and wireless network structure. The IoT sensors can use various types of connections such as RFID, Wi-Fi, Bluetooth, and Zig Bee, in addition to allowing wide area connectivity using many technologies such as GSM, GPRS, 3G, and LTE. IoT-enabled things will share information about the condition of things and the surrounding environment with people, software systems and other machines. by the technology of the IOT, the world will becomes smart in every aspects, since the IOT will provides a means of smart cities, smart healthcare, smart homes and building, in addition to many important applications such as smart energy, grid, transportation, waste management and monitoring [1] .

With the advent of development of IoT (Internet of Thing) technology, the automotive field has undergone drastic changes in terms of customer comfort and safety. The structure of vehicles has become more complex. Increased degree of automation has been incorporated in the design of the vehicle. Significant safety features have been added at lower costs. Now a day, the focus is on vehicle interior network application and the wireless data transmission technology. This system is based on the widely used CAN bus technology. Therefore vehicle interior network came into existence. CAN (Controller Area Network, CAN); relying on its stability performance, low price and high reliability and real-time, has now been widely used in automotive internal network[2]. GSM and GPRS technology are used for sending this real time information of vehicle status when any abnormal faults are detected to remote location for performance evaluation and monitoring. The GPS system will provide location and time. GPS provides accurate location and time information for an unlimited number of users in all weather, day and night, anywhere in the world. It has the advantages of a wide coverage, high accessing speed, charging according to the flow rate. This has influenced us to remotely monitor the critical parameter of vehicle based on IoT (Internet of things) technology. This paper mainly focuses on remotely monitoring the vehicle parameter based on CAN bus through web application by using IoT technology, which can be used to improve the efficiency of monitoring, to maintain the system security, to lower the maintenance costs as well as the operating costs.

## II. LITERATURE REVIEW

### 2.1 Problem Formulation

In the Literature survey, we are analyzing the several problems like location of vehicle, engine burst information engine temperature, fuel & battery consumption analysis information about the condition of the driver such as, Drunker not drunk. With these some problem are not define previous work. Hence we are proposing the work smart vehicle monitoring system form removing these problems.

### 2.2 Proposed system

The main contributions of this paper are summarized as follows.

1. In my base Paper vehicle tracking and monitoring system to enhance the safety and security driving using IoT Proposed Monitoring the temperature of the vehicle system avoid sparking of the vehicle and also providing the fuel consumption & Battery information of display.
2. In this Paper Proposed using of GSM Module when vehicle is provide the unusual activity & driver is facing any problem then it give message to the owner of vehicle.
3. In this proposed IOT system that allows the owner to monitor the data provided by the sensors available on a vehicle, and to control processes automatically, anytime and anywhere using cloud system analysis.
4. An Android-based IoT system for vehicle monitoring and diagnostic paper Proposed work is to monitor the critical parameter of vehicle system through an IoT based network in order to control it remotely. The information from the sensors is transmitted via the mobile radio network. The vehicle consist of onboard GPRS module which collect the CAN data from the CAN device fitted on the vehicle and send it to the remotely located server.
5. The proposed conceptual system in this work is to monitor the critical parameter of vehicle system through an IoT based network in order to control it remotely. The information from the sensors is transmitted via the mobile radio network output Module) or CAN (controller area network) controller.
6. The uniqueness of the proposed system is that it will be easier to monitor the parameter of the vehicle in a holistic level.
7. The vehicle consist of onboard GPRS module which collect the CAN data from the CAN device fitted on the vehicle and send it to the remotely located server.
8. In this proposed paper I will represents the IOT application block diagram for remotely monitoring the vehicle parameter.. The diagram consist of three stage starting with the on board unit which will collect the sensor data from vehicle networks through I/O Module (input/output Module) or CAN (controller area network) controller.

Table 1: Study and comparison between existing systems.

| Existing System | Technology | Methodology | Comment |
|---|---|---|---|
| Bus transportation system using WSN | PC based system WSN are used to monitor the system | Location analysis sending information to server | The system is complex |
| Children tracking system | GPS mobile ad hoc network, PC based system | Children tracking and data analysis | The system is easily upgrade. |
| Public transport management services | Microcontroller and PC based system | GPS tracking sending alert messages | Complex |
| Intelligent bus monitoring & management system | RFID ,GPS ,GSM PC based system | GPS tracking database collection alerting | User friendly |
| On board public information system using GPS and GSM for public transport | GPS GSM/GPRC, PC based system | GPS tracking control using map and sending alert SMS | User friendly |
| GPS-GSM based tracking system with Google map based monitoring | GPS GSM and Microcontroller based system | GPS tracking monitoring using Google map and alerting | The system is User friendly |
| GNSS based bus monitoring & sending messages to passenger | PC based system | RFID monitoring , location tracking and alerting | The system is easy to Upgrade |
| Vehicle tracking and monitoring | System is based on ARM7 and LPC2148 Linear programming microcontroller | Tracking ,temperature sensing and alerting | The system is User friendly |

## III. PROPOSED SYSTEM ARCHITECTURE

### 3.1 Internet of Thing (IoT)

IoT technology is the interconnection of different networked embedded devices used in the everyday life integrated into the Internet. It aims to automate the operation of different domains such as home appliances, health care systems, security and surveillance systems, industrial systems, transportation systems, military systems, electrical systems, and many others. In order to achieve a fully automated process, devices in the different domains must be equipped with micro-controllers, transceivers, and protocols to facilitate and standardize their communication with each other and with external entities.

IOT system is composed of three layers: the perception layer, the network or transmission layer, and the application layer. The perception layer includes a group of Internet-enabled devices that can percept, detect objects, collect systems information, and exchange information with other devices through the Internet communication networks. Sensors, Global Positioning Systems (GPS), cameras, and Radio Frequency Identification Devices (RFID) are examples of devices that exist at perception layer. The network/transmission layer is responsible of forwarding data from perception layer to the application layer under the constraints of devices' capabilities, network limitation and the applications' constraints. IoT systems use a combination of Internet and short-range networks based on the communicated parties. Short-range communication technologies such as Bluetooth and ZigBee, CAN (controller area network) are used to carry the information from perception devices to a nearby gateway. Other technologies such as Wi-Fi, 2G, 3G and 4G, carry the information for long distances based on the application. The upper layer is the application layer, where incoming information isprocessed to induce insights upon which we can design better power's distribution and management smart cities, power system monitoring, vehicle health strategies. Applications aim to create smart homes, smart cities, power system monitoring, vehicle health monitoring, demand-side energy management, coordination of distributed power storage, and integration of renewable energy generators [3].

### 3.2 GPS

A GPS consists of three discrete parts. These three parts are: the satellites in orbit, the ground control stations, and the users (satellite receivers found in land, air, sea). For the part of satellites in orbit, twenty-four (24) satellites are in orbit, of which twenty to twenty-one (20–21) are in operation. Four (4) from these 21 satellites are visible at any time from any station on earth. The vertical and horizontal position for each specific station is feasible to be obtained in the form of X, Y, Z coordinates (position vector). The information concerning the speed ( dt/dx , dt/dy , dt/ dz ) of a vehicle, airplane, ship etc. is also available all over the world, at any time, and under all weather conditions. Ground control station consists of master control station, monitoring station and injecting station.

### 3.3 GPRS

The general packet radio service (GPRS), a data extension of the mobile telephony standard GSM, is emerging as the first true packet-switched architecture to allow mobile subscribers to benefit from high-speed transmission rates and run data applications from their mobile terminals. It is a GSM based wireless packet switching technology, providing end to end and wide-area wireless IP connectivity, whose purpose is to provide packet based form of data services for GSM users, shown in fig. 1. GPRS provides high-speed wireless IP services for mobile users, fully supports the TCP/IP, dynamically allocates IP addresses for the mobile sites and achieves mobile Internet functions, accessing to the Internet through GGSN. Any kind of business in the fixed Internet will also be able to be achieved through GPRS mobile networks. Two new network nodes GGSN and the SGSN are introduced for transmission and reception of GPRS data packets. Node GGSN is a gateway connecting GPRS network with external data network, by which GPRS packet data packets can be performed protocol conversion, so these data packets can be sent to a remote TCP/IP [4].

Fig.1 GPRS Concept.

## III. CONCLUSION

Use of IOT for monitoring of a vehicle parameter is an important step as day by day large number of vehicle populated on road. Thus monitoring of vehicle parameter will enhance future decision making process for easy operation and maintenance of the vehicle. In this paper we proposed an IoT based remote monitoring system for vehicle parameter, the approach is studied, implemented and successfully achieved the remote transmission of data to a server for supervision. IoT based remote monitoring will improve energy efficiency of the system by making use of low power consuming advanced wireless modules thereby reducing the carbon foot print. Web Console

based interface will significantly reduce time of manual supervision and aid in the process of scheduling task of vehicle.

## REFERENCES

[1]. Zeinab Kamal Aldein Mohammed, Elmustafa Sayed Ali Ahmed, "Internet of Things Applications, Challenges and Related Future Technologies".
[2]. M.Sharath , M.Sudhakar, "Vehicle Health Monitoring System Using CAN".
[3]. Manar Jaradat, Moath Jarrah, Abdelkader Bousselhamb, Yaser Jararweha,_, MahmoudAl-Ayyouba, "The Internet of Energy: Smart Sensor Networks and Big Data".
[4]. Laisheng Xiao, Zhengxia Wang "Internet of Things: a New Application for IntelligentTraffic Monitoring System.
[5]. D. Bandyopadhyay, J. Sen, "Internet of Things: Applications and Challenges in Technology and Standardization," SPRINGER Wireless Personal Communications, vol.58, no.1, pp.49-69, May 2011.
[6]. Brahima Sanou. (2017, Mar. 10). "ICT Facts and Figures 2016" [Online]. Available: http://www.itu.int/en/ITU-D/Statistics/Documents /facts/ICTFactsFigures2016.pdf
[7]. Dave Evans, "The Internet of Things - How the Next Evolution of the Internet Is Changing Everything," CISCO, pp.1-10, Apr. 2011.
[8]. C. Rowland, E. Goodman, M. Charlier, A. Light, A. Lui, "Designing Connected Products: UX for the Consumer Internet of Things," O'Reilly, May 2015.
[9]. António F. Maio, José A. Afonso, "Wireless Cycling Posture Monitoring Based on Smartphones and Bluetooth Low Energy," Lecture Notes in Engineering and Computer Science: Proceedings of the World
[10]. N. Lu, N. Cheng, N. Zhang, and X. Shen, "Connected Vehicles: Solutions and Challenges", IEEE Internet of Things Journal, vol. 1, no. 4, pp. 289-299, 2014.
[11]. A. Benslimane, "Localization in Vehicular Ad Hoc Networks", in Proceeding of Systems Communications, pp. 19-25, 2005.
[12]. F. Yang, S. Wang, J. Li, Z. Liu, and Q. Sun, "An overview of internet of vehicles", China Communications, vol. 11, no. 10, pp. 1-15, 2014.
[13]. W. Sun, J. Liu, and H. Zhang, "When smart wearables meet intelligent vehicles: challenges and future directions", IEEE Wireless Communications Magazine, vol. 24, no. 3, pp. 58-65, 2017.
[14]. F. Zhou, and A. Benslimane, "Reliable safety message dissemination with minimum energy in VANETs", in Proceeding of Global Communications Conference, pp. 587-592, 2014.
[15]. H. Zhang, J. Li, B. Wen, and J. Liu, "Connecting intelligent things in smart hospitals using NB-IoT", IEEE Internet of Things Journal, 2018. DOI: 10.1109/JIOT.2018.2792423.
[16]. S. Yang, and Z. H. Liu, "Anomaly Detection for Internet Of Vehicles: A Trust Management Scheme With Affinity Propagation", in Proceeding of Mobile Information Systems, pp. 1-10, 2016.
[17]. V. L. Praba, and A. Ranichitra, "Isolating Malicious Vehicles and Avoiding Collision Between Vehicles in VANET", in Proceeding of IEEE International Conference on Communication and Signal Processing, pp. 811-815, 2013.
[18]. K. A. Alheeti, A. Gruebler, and K. D. Mcdonaldmaier, "An Intrusion Detection System Against Malicious Attacks on The Communication Network of Driverless Cars", in Proceeding of IEEE Consumer Communications and Networking Conference, pp. 916-921, 2015.
[19]. P. Jin, S. Parker, and J. Fang, "Freeway Recurrent Bottleneck Identification Algorithms Considering Detector Data Quality Issues", Journal of Transportion Engineering, vol. 138, no. 10, pp. 1205-1214, 2012.