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Classifying Vehicle Activity Patterns from Iot Device & Remote Monitoring System

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Abstract **- By using 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. This will facilitate preventive maintenance, fault detection, historical analysis of the vehicle in addition to real time monitoring. In this paper analysis 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. 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. We are Using Support-Weight Approach for classification of IoT Data, after that we compared some parameter like Computation Cost, Computation Time, Accuracy etc.**

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 consists 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 ZigBee, 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. RELATED WORK

Existing system	Technology	Methodology	Comment
Bus transportation system using WSN[5], [8]	PC based system WSN are used to monitor the system	Location analysis sending information to server	The system is complex
Children tracking system[6]	GPS mobile ad hoc network, PC based system	Children tracking and data analysis	The system is easily upgrade.
Public transport management services[7] [4]	Microcontroller and PC based system	GPS tracking sending alert messages	Complex
Intelligent bus monitoring & management system[9]	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 [10]	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 [11]	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 [12]	PC based system	RFID monitoring , location tracking and alerting	The system is easy to Upgrade
Vehicle tracking and monitoring [13]	System is based on ARM7 and LPC2148 Linear programming microcontroller	Tracking ,temperature sensing and alerting	The system is User friendly

III. PROBLEM FORMULATION & SOLUTION

- **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, Drunk or 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.

IV. TEMPERATURE AND LOCATION MODEL

1. Hyper terminal

HyperTerminal is a program that is included with every version of the Microsoft Windows operating system and allows your PC to function as a computer terminal to connect with other systems remotely. The remote systems are mainframe computers that provide programs that accept a terminal on the other end of the connection. HyperTerminal is part of the Windows Me which is shipped by Microsoft. If your computer has WinMe already installed than the HyperTerminal program should be activated. If your computer has recently been upgraded then you may not have HyperTerminal. If HyperTerminal is installed on your computer operating system you can activate it by clicking Start on your main toolbar and choosing "Programs".

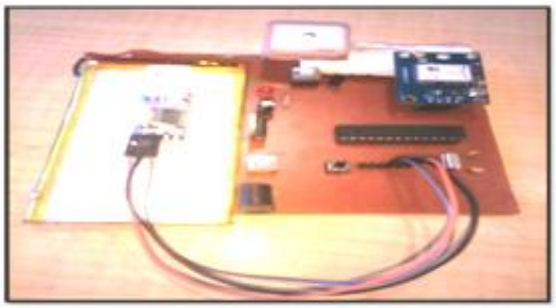

Fig.1. Proposed block diagram.

2.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.

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].

3. Model Description

After sensing the data from sensor and we used a java based user interfaces between hardware and user. Working of different interfaces as given below.

- User Login Screen
- Vehicle Signup Process
- Add Vehicle option
- User and Vehicle Details
- Alert Screenshot Temperature and Speed
- User Details for Service centre or owner
- Vehicle Location Details

V. RESULT ANALYSIS

As the requirement of the system and implemented by us here is the comparison analysis is made based on the different data of a Vehicle Temperature, Speed and location, We compared and analysis on these data with an old approach Matrix Factorization and a new approach Multi Cost Computation Approach on different parameter like time, cost and accuracy.

4.Computation Time MF Vs MCCCA

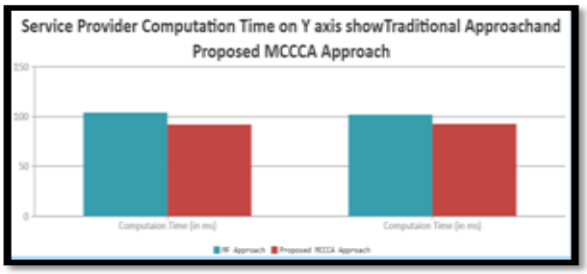

Fig.2. Computation Time MF Vs MCCCA.

In the fig.2 above, the comparison analysis of the obtained computation time while processing the Matrix factorization and Multi Cost Computation Approach is shown. The proposed approach is shown as less computation time while comparing with traditional factorization approach.

5.Computation Cost MF Vs MCCCA

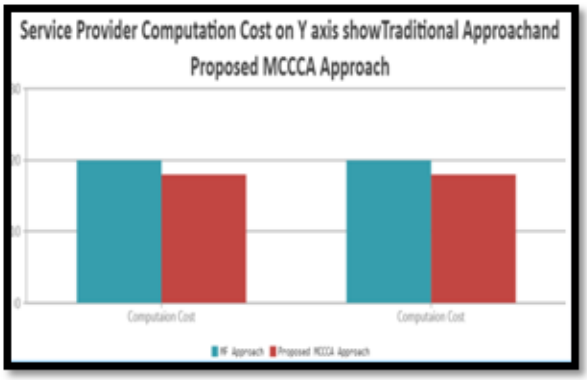

Fig.3. Computation Cost MF Vs MCCCA.

In the fig.3 above, the computation cost comparison of approach MF and MCCCA is presented. The result graph shows the less cost consumption while comparing with matrix factorization approach.

6.Accuracy MF Vs MCCCA

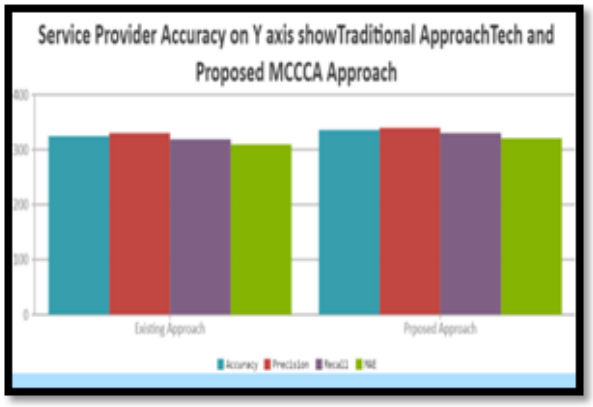

Fig.4. Accuracy MF Vs MCCCA.

In the fig. 4 above, the comparison of both the technique is performed using the efficiency parameter accuracy, precision, recall and MAE. Computed and compared bar graph shows the high accuracy and efficiency of MCCCA algorithm over MF Approach.

VI. CONCLUSION

In this paper after implementation is to monitor the critical parameter of vehicle system through an IoT based network in order to control it remotely. system and implemented by us here is the comparison analysis is made based on the different data of a Vehicle Temperature, Speed and location, We compared and analysis on these data with an old approach Matrix Factorization and a new approach Multi Cost Computation Approach on different parameter like time, cost and accuracy. In this research give the data analysis of different parameter of vichiele speed temperature and location and also monitoring the speed & temperature of vehicle and inform the driver & owner of vehicle.

VII. FUTURE WORK

Future work includes the development of new functionalities for the system. We also intend to evaluate new hardware and software. After this implementation we extended the work on use of different module like GSM, Temperature, Ultrasonic sensor .for the improvement of vichele location and monitoring properly and also intimated the system performance vi message or provide the call facility on emergency no when vichele & driver is not good condition and also improve vichele staring part we use vibrator sensor it can be protect the driver accident when driver is long derive sleeping.

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