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Remotely Monitoring Driver Activity using Distributed Ground Sensors

R.Narmadha, U.Anitha, M,S,Godwin Premi, G.D.Anbarasi Jebaselvi

Abstract: ***An autonomous ground Intelligence, Surveillance and Reconnaissance (ISR) sys- tem comprising of multiple distributed, wirelessly communicating smart sensors. Hence remotely monitor the driver's activity a portable is fixed in the vehicle and a finger print sensor is used as a key .Fingerprint is given and it get activated then also the ground sensors (acoustic, magnetic, accelerometer) get activated. If any circumstance situations happen like theft (or) enemies attacked the sensors get activated and the signals and information gets central office. It is used to detect metals and gives alert messages during critical level these alert messages and tracking is done through ubidots app, it is license free app used for this project.***

Key words: ***Accelerometer, Magnetometer, security system monitoring***

I. INTRODUCTION

Remotely monitoring driver activity is an important for security service to avoid un necessary damages like vehicle hefting ,unauthorized persons entries into the armored vehicles [1][2]and far distances enemies movement are the major things discussing through the project Initially cost set up of monitoring drivers activity is expensive this paper proposes a solution through an autonomous ground surveillance and reconnaissance to remotely monitoring the drivers activity a portable is fixed the vehicle and finger print sensor is used a key . To increase security of defense vehicle monitoring, protecting and tracking against penetration by intruders ,a improved and wide range of high-quality, scalable cellular modules perfectly suited for fulfill the communication needs of specialized areas including Government agencies, military organizations reliable remote asset tracking system, mission-critical resources, surveillance& monitoring vehicles and emergency call system.The paper focuses on the driver activity monitoring and detection of driver alertness through automation system [6], [7], [8], image processing techniques [9], [10], [12]. Machine Learning techniques such as [13] exist for

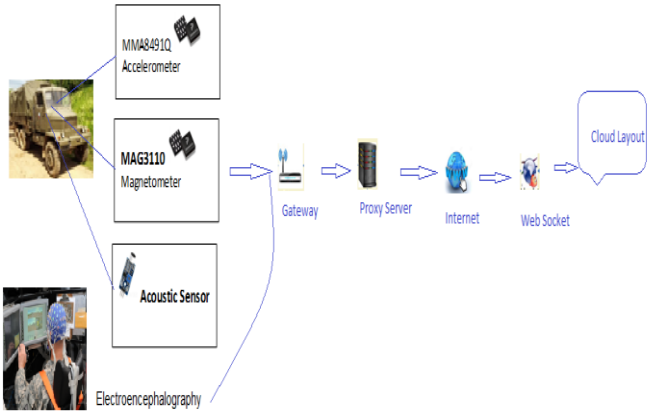

Fig 1 Basic concept of driver activity monitoring

Remotely monitoring drivers activities using distributed ground sensors (acoustic, accelerometer, magnetic) were connected through a wireless communication [14][15] technology to cloud.

II. REMOTE MONITORING

To remotely monitoring drivers activity using distributed ground sensors (acoustic, accelerometer, magnetic).Fingerprint is given and authorized persons only access the vehicle otherwise when the finger print is not matched the buzzer is on for unauthorised people the alert message is also sent the registered mail or number .The control of finger print[3][4][5] module and whole system is used on an node mcu microcontroller . NODE MCU is a group of specialised transmitting with a communication infrastructure for monitoring an recording conditions at diverse locations .NODE MCU consists of sensors which distributed in any manner to sense physical phenomenon's and then information gathered is processed to get relevant results and the information get forwarded to multiple nodes and a gather way data connected to other networks .The accelerometer is an device used to compose the acceleration forces such forces may be static ,like the containers force to dynamic sense movement or vibrations measuring the sensor in every conditions .If any un circumstances occurred send the alert message through mail or phone message. Acoustic sensor are sound sensors because their detection of mechanism is a acoustic on the surface of the material ,any changes to a characteristics of the propagation path effect the velocity and for amplitude of the wave .It is used as sound sensor it sends alert message during critical level .The

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magnetic sensors or hall effect sensor is transducers which its outputs voltage in reaction in magnetic field the sensor can be used in order to measure the current without interrupting the circuit .It is used to detect metals and gives alert messages during critical level these alert messages and tracking can be done through cloud app it is license free app for using this project .Cloud device is a virtual representation of a data-source or simply, an asset taking sensor data and transmitting said data through a connection protocol to the cloud. Main concern about the advanced security measures that have to be progressed in military camps .Avoid UN necessary damages like vehicle hefting, unauthorised entries into the armored vehicles and far distance enemies movement are the major things we are discussing.The Remotely monitoring driver activity using distributed ground sensors is successfully designed and implemented. The Arrangement of NodeMCU along with the finger print module and increasing safety towards driver activity. In this way overall system efficiency is enhanced. The acoustic sensor is used to detect the distance sound. The accelerometer sensor is used to measure the movement of the vehicle in all directions. Magnetic sensor is used to identify the metals. Here NodeMCU is used to process the data to the cloud .The finger print module and all the sensors data is sent to NodeMCU. Here in this proposed model the finger print module is used to send the authorized data and buzzes unauthorized activity.

III. METHODOLOGY

NODE MCU is a group of specialized transducers with a communication infrastructure for monitoring and recording the conditions at diverse Locations. The accelerometer is a device used to compose the acceleration forces, such forces may be static. If any circumstance Situations occurred sends the alert message through mail or phone message. Acoustic sensors are sound sensors because their detection of mechanism is a acoustic on the surface of the material any changes to a characteristics of the propagation path effect the velocity and for amplitude of the wave .It is used as sound sensor it sends alert message during critical level

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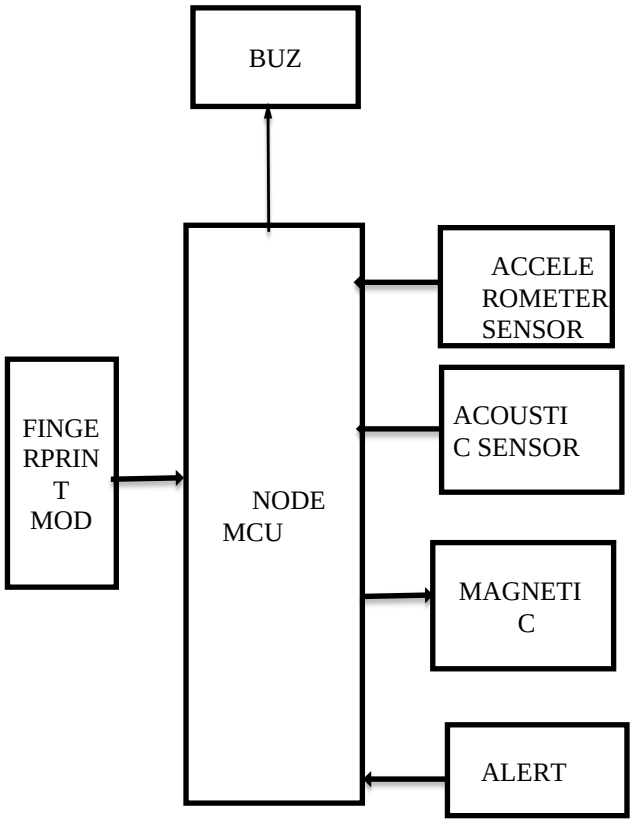

Fig.2 Remotely Monitoring Drivers Activity Using Distributed Ground Sensors

The magnetic sensors or Hall Effect sensor is transducer where output voltage in reaction in magnetic field the sensor can be used. In order to measure the current without interrupting the circuit the sensors is typically integrated with a permanent magnet or wound core that sounds the surrounding.In order to repeat the above process and repeating the same process continuously with the help of NodeMCU software to monitor the data regularly. Using this software the data monitored constantly.

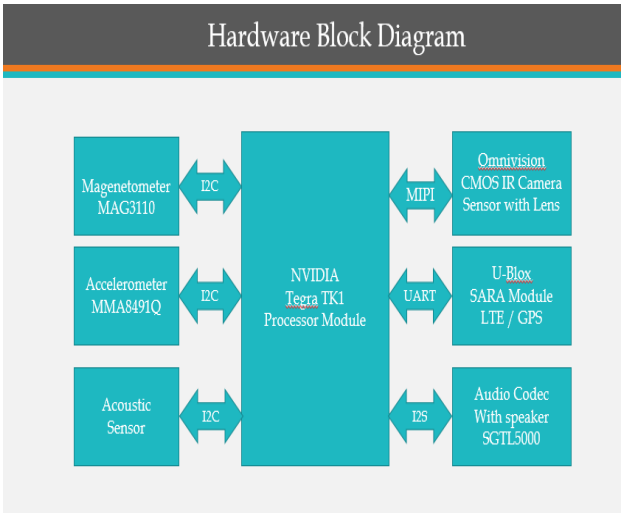

Fig 3 Hardware Description

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IV. EXPERIMENTAL OUTPUT AND PERFOMANCE ANALYSIS

After the installation of this finger print authentication in the vehicle, secured environment is created in the vehicle. Only the authorized person will be allowed to drive the vehicle. Other than the authorized person will not permit to drive the vehicle. The ignition supply is connected to the finger print authentication.The legitimate only permitted to operate the vehicle. If an unauthorized person operated the vehicle, permission is denied for the person. It is not possible to start the vehicle. In the display also, the will be displayed with LED.

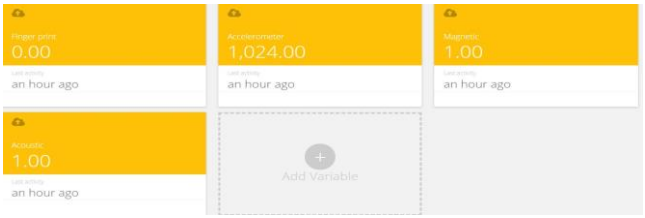

Fig 4 ALERT MESSAGE Finger print of unauthorised person

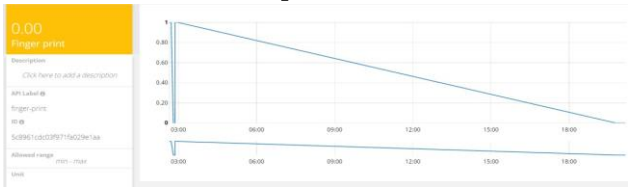

Fig 5 ALERT MESSAGE - Unauthorized person

Once the authorized person starts the vehicle, all the sensors were activiated.The direction of the information in all pitch, yaw and roll axis are given by the accelerometer. The axis information (x -axis-axis and z- axis) will help to take the direction of the vehicle. Here the figure displays, weather the sensor is activated or not on the system. If it is activated means, minimum and maximum value is adjusted

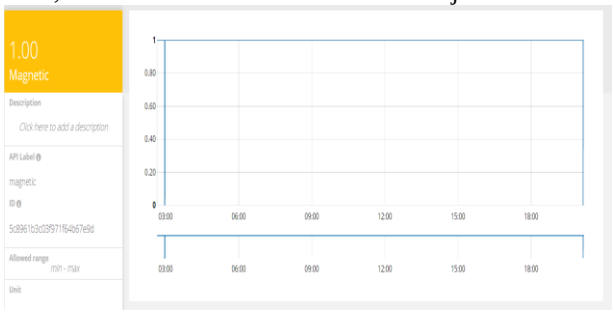

Fig 4 ALERT MESSAGE - Unauthorized person Accelerometer

An analogous situation may develop between a physical security force and its adversaries. Acoustic sensor systems can be used to detect intruders approaching in ground vehicles and other unauthorized vehicular activity.

The acoustic sensor system must be able to detect the intruder's activity in the presence of acoustic clutter and to discriminate it from friendly activity

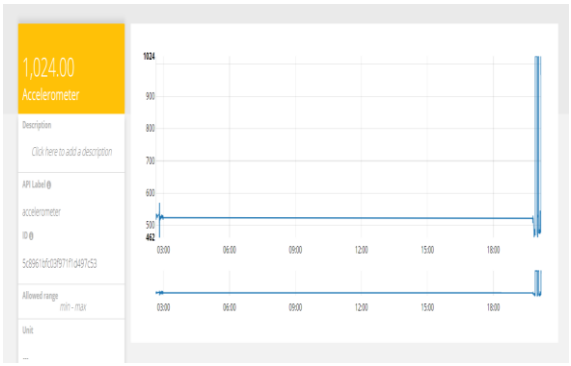

Fig 5 ALERT MESSAGE - Unauthorized person Magnetic Sensor

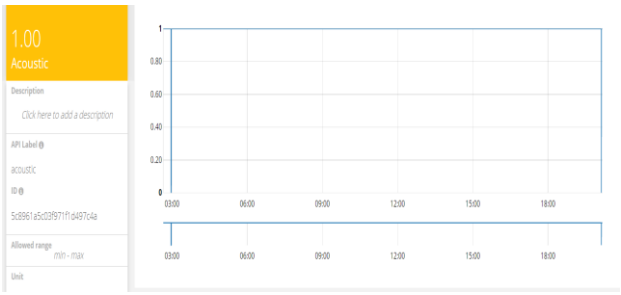

Fig 6ALERT MESSAGE - Unauthorized person Acoustic Sensor

Sensor output Since the vehicle started with authorized person, simultaneously all the sensors were activated and the magnetometer also show the value is critical or not with respect to time.

Table 1.Experimental Results

Sensors Type	Min Value	Critical Values
Accelerometer	550(m/s^2)	1024(m/s^2)
Magnetic Sensor	1(gauss)	0(gauss)
Acoustic Sensor	1(db)	0(db)

In this Table 1, minimum and critical values of each sensor were analyzed with the help of the bench setup. For accelerometer the minimum value is 550(m/s^2), acoustic minimum value is 1(db.), magnetic minimum value is 1(gauss)

V. CONCLUSION

From the portable model, an autonomous ground surveillance and reconnaissance to remotely monitoring the drivers activity a portable is fixed the vehicle and finger print sensor is used a key .Fingerprint is given and authorized persons only access the vehicle otherwise when the finger print is not matched the buzzer is on for unauthorized people the alert message is also sent the registered mail or number

The control of finger print module and whole system is used on a NodeMCU microcontroller .From this system, the monitoring of the driver system with sensors is analyzed from a distance. In future the response of the sensors was made with threshold value and controlled the system successfully.

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