Rash Driving Alert System

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***ABSTRACT*: As is needless to say; a majority of accidents, which occur, are due to rash driving. Rash driving might be considered as sudden change in speed, constant change in path and so on. Rash driving is most unsafe for individuals. Accidents are expending step by step because of increment in number of vehicles. It has become very difficult for the authorities to prevent or decrease such lethal mischances on the highway or road and all their efforts are in vain. So, our idea is to outline a module which can distinguish the vehicle whenever it is rashly driven or driven above permissible speed limit, and transmit the data to the concerned authority. In this paper, we propose a very productive framework went for early recognition and alarm of dangerous vehicle rash driving.**

***KEYWORDS*: Texas Instrument, Tiva-C Launchpad, CC3100 boosterpack, SensorHub, low power consumption, accuracy**

I. INTRODUCTION

This is a basically an IOT based Project. Now a days IoT is Making the boom in the Era of New World, so based on that topic of IoT "Rash Driving Alert System" is the proposed Project totally works with IoT. In this project system, for the purpose of safety, is to minimize the rash driving related accident on our street. By controlling physical amount for example acceleration, temperature, pressure, etc. using the TIVA C Launchpad, programmed framework has been accomplished. So using this we will have the capacity to take real time updates of the vehicle accident and send the alert mail to the vehicle proprietor and respective authority accordingly. Here, we will use 3-axis accelerometers to measure acceleration along x-axis and y-axis. The main target of this system is to reduce the chances of an accident. When vehicle changes its direction suddenly or if there is sudden increase in acceleration, the system detects it and considers this as rash driving. The system then sends an email to the vehicle proprietor and the respective authority. If the driver continues drive the vehicle in rash manner again, another email is send stating that the proprietor of the vehicle is fined.

II. LITERATURE SURVEY

In the course of the most recent couple of years' learning in hardware and calculation has been used to illuminate display day challenges. In the cutting edge of the electronics transformation has been the microcontroller. The microcontroller has been utilized together with different sensors to quantify and control physical amounts like temperature, humidity, warmth and light.

[1]Vangala P. Kumar, K. Rajesh, Motike Ganesh, India Educators' Conference (TIIEC), 2014 Texas Instruments: This research paper consists of two 3D-analogoutput accelerometers, signal conditioning circuit, Digital Signal Controller and transmitter section. Signal conditioning circuit fills the need of filtering and amplification of these signals taken from the accelerometer. On-chip analog-to-digital converter on DSC (TMS320F28027) converts conditioned analog data from signal conditioning circuit to digital data. These digital signals are further processed in DSC to perform cross correlation operation with signals which are already stored in the flash memory. The flash memory is firstly loaded with the signal patterns generated when the vehicle is rashly driven. When the correlated is not as much as specific threshold value, the message is transmitted to the concerned authority about the vehicle being over speed, or rashly driven.

[2] T. Shyam Ramanath, A. Sudharsan, U. Felix Udhayaraj, Mechanical and Electrical Technology (ICMET), 2016 4th International Conference: In this research paper, in order to monitor the driver conduct advanced cell sensors are utilized. The rash driving is recognition utilizing increasing speed and orientation sensors. Number of mischances caused by weakness of sharpness in vehicle drivers represents a genuine peril to individuals, not just the jumpers who are driving their vehicle yet in addition to the overall population represent a genuine danger because of hazardous driving. Driving style can typically obliging and perceive driving occasions that diminish into classifications can support in medium security frameworks. Here an electronic unit with two sensors, to be specified GPS and accelerometer, and hypothetical models, which incorporate both increasing speed and speed information, are utilized to distinguish and report whimsical driving of a minibus taxis.

[3]Pranoto H. Rusmin, Andrew B. Osmod, Arif S. Rohman System Engineering and Technology (ICSET) 2013, IEEE 3RD International Conference: This research paper consists of various sensors such as organic markers of tiredness distinguish brain waves, heart rate, and pulse signals. This system in return creates the best identification exactness yet requires physical contact with the driver. The second types of behavioural measures are vehicle speed, sidelong position, and rotation angle. The third type is the analysis of the face. This method uses physiological and non-visual symptoms created by the body when sleepy. For this purpose, the first electrode will be connected to the body of the driver and will record the electrical action in specific parts of the body i.e. brain, muscle, heart, etc. Signal that has been recorded earlier will be analysed to determine the driver's level of drowsiness. The use of 30 electrodes in a group when the driver indicates that sleepiness increases the signal level theta and alpha activity also increased.

III. SYSTEM DESIGN

In this block the Tiva-C Launchpad 1 is connected to SensHub BoosterPack. The SensHub BoosterPack has on-board MPU9150 9-axis motion sensor. In this project, only the 3-axis accelerometer data is recorded for project. The interconnection between the Tiva-C LaunchPad 1 and the SensHub BoosterPack is implemented using SPI protocol. This completes our first sub-system.

The second sub-system comprises of another Tiva-C LaunchPad 2 and one CC3100 BoosterPack. Tiva-C LaunchPad 2 is interconnected with CC3100 Wi-Fi BoosterPack. The Wi-Fi BoosterPack adds networking capability to our system. Tiva-c LaunchPad 1 communicates with the Tiva-C LaunchPad 2 using simple GPIOs. This communication bridge is utilized to send a status data to Tiva-C Launchpad 2 from Tiva-C Launchpad 1 whenever the system detects rash driving. Here, the Tiva-C Launchpad 2 is configured to trigger an email based on input data from the first sub-system.

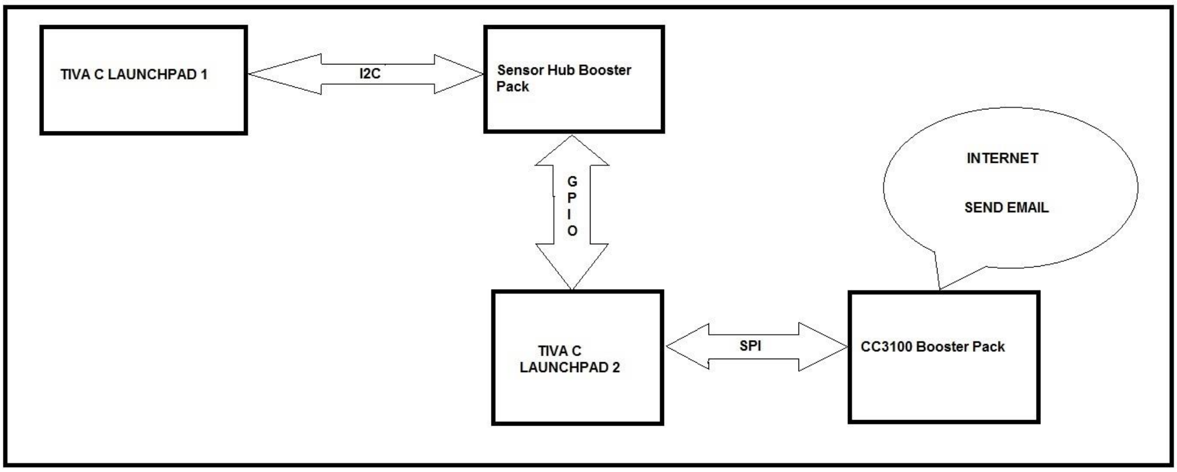

Fig 1: Block Diagram

As represented in Fig 2, drifting is generated as a result of steering wheel rotation in a particular direction. The example coordinating is to check the variety in the accelerometer esteems. In the case of the variety surpasses the edge a strange curvilinear development of vehicle is considered happening, demonstrating that the driver has issues in keeping up the path position.
A straightforward perception in rash driving examples is that the driver isn't keeping up a consistent speed and is over speeding while in the meantime driving which makes him to drive in an uneven way, which is outlined in Fig. 3. This is a condition in which an motor is permitted or compelled to turn past its plan restrain.
As outline in Fig 4, in the event that one is driving at rapid speed and all of the suddenly yanks the wheel with a cruel input, they will cause the car to jerk abruptly coming about into the sharp turning. This will be detected by the system as rash driving.

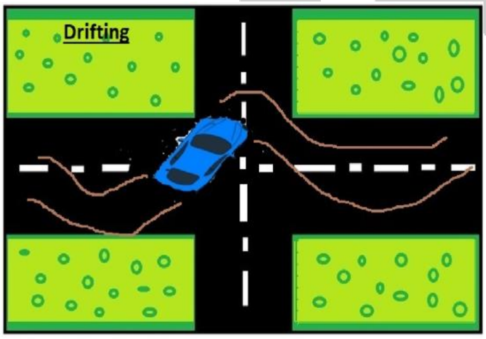

Fig 2: Drifting

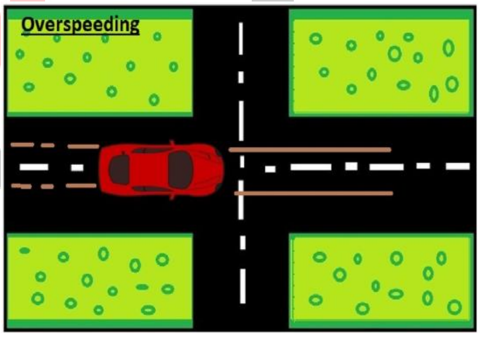

Fig 3: Over speeding

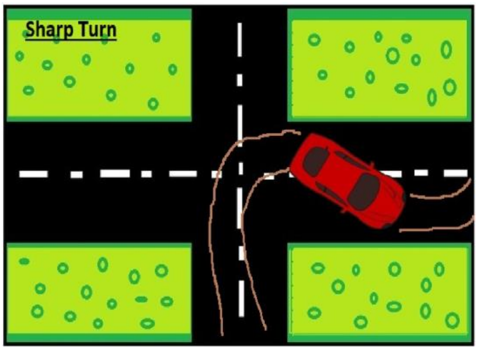

Fig 4: Sharp Turn

IV. RESULT AND ANALYSIC

We have one Tiva-c LaunchPad +SensHub BoosterPack. This LaunchPad is programmed to read the 3-axis accelerometer values from the SensHub BoosterPack and compare the values with threshold values(-5 to+5) set in the program. Whenever, rash driving happens, the accelerometer values will exceed beyond the threshold range and it will send a trigger signal to another LaunchPad.

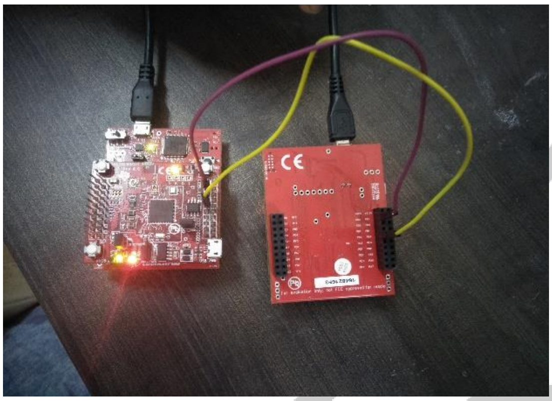

Fig 5:-interconnection of both Launchpad's

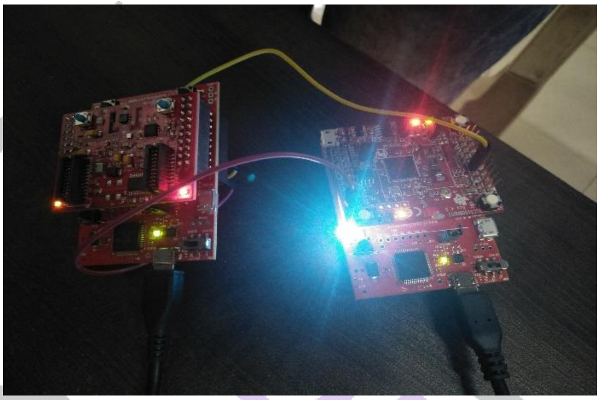

fig 6:-Whenever rash driving happen

We can see value of variables which in code represent the accelerometer values along x, y and z –axes .

pfData	float[3]	0x200003C8	0x200003C8
(x)= [0]	float	-0.521934	0x200003C8
(x)= [1]	float	-1.283287	0x200003CC
(x)= [2]	float	10.21961	0x200003D0
Add new expression			

Fig 7: -Values of 3-axis accelerometer

Here [0]→x-axis, [1]→y-axis, [2]→z-axis (acceleration due to gravity). Now slightly shake the LaunchPad and see the values changing. The 2nd Tiva-c LaunchPad + CC3100 BoosterPack is configured to send an email to the respective Authority such as Traffic,Hospitals,etc. whenever it receives a trigger signal from the first Tiva-c LaunchPad. When the email is triggered, the white light will glow on the first Tiva-c LaunchPad for a while. We can see our result on PC by connecting Tiva-c +CC3100boosterpack to PC using USB cable. And also a mail is send to destination email address.

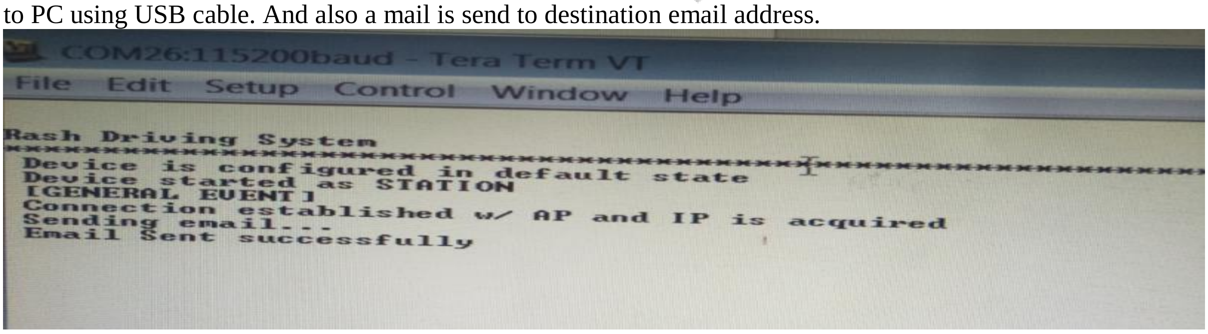

Fig 8:- Output on TeraTerm

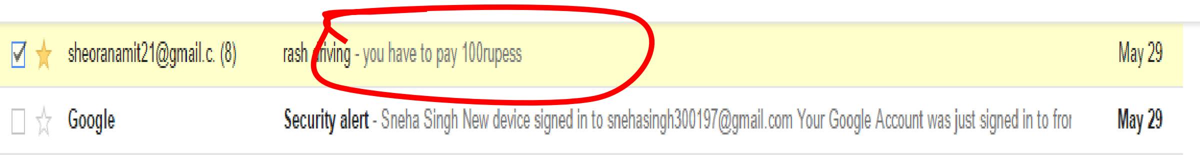

Fig 9: - Email sent to destination mail address

V. CONCLUSION AND FUTURE WORK

The rash driving alert system can be used with accelerometer sensor to distinguish any unusual or risky driving move. In this, the device will collect and analyze the data from its accelerometer sensor to recognize any risky condition and then it will send email to the user. The rash driving recognizing techniques can be provided along with the sensors and the techniques can be useful along in the road side units. Our project will be useful for both rash driving and overspeeding of vehicles detection. No module is currently available which consumes such a low power to detect rash driving and our project provides that facility. It has various sensors such as pressure, temperature; humidity sensor and accelerator in built within the sensor hub which can further be extended to control the speed and rash driving in humid climate and detect the overheating of vehicle. The inbuilt sensor also in result reduces the size of the system to a great level.

Acknowledgment

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[3]Pranoto H. Rusmin, Andrew B. Osmod, Arif S. Rohman System Engineering and Technology (ICSET) 2013, IEEE 3RD International Conference

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