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Smart Bike Accident Detection System Reporting with Black Box

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Abstract - *The automobile industry is developing quickly in terms of technology and also the number of vehicles on road. With this the number of accidents is also growing at a shocking rate. Over last three years' road fatalities were in lakhs, out of which two wheelers account for highest number of road crash deaths. The proposed model, smart bike accident detection system will be more efficient and reliable than any eyewitness calling for help. This model aims at finding the occurrence of bike accident and recording with black box. Whenever accident occurred, the, tilt sensor senses the accident happened with vehicle. The Raspberry Pi gets the input from sensor and sends the accident alert information to nearby hospital unit using GPS that finds location of the vehicle using Wi-Fi and, the alert message is sent to the rescue team using GSM. An android application is developed that detects and sends alerts message to the concerned authorities and relatives. Application will also share the exact location of the vehicle in alert message that can help in saving time. Video is recorded at the same time and saved in the memory. It will facilitate connectivity to the nearest hospital and provide medical help through IOT technology.*

Key Words: Smartbike, IOT, Black Box, Raspberry Pi, GSM, GPS, Tilt sensor, Android APP

1. INTRODUCTION

As stated by WHO, over a million individuals in the world pass away every year as of road accidents. There may be various causes for the accident to occur. Most of the accidents are occurring for the reason that driver consumes alcohol while driving, over speed, neglecting the traffic rules etc. in most of the cases a motorcycle rider becomes a quick victim, where the rider has very less chances of surviving. Thus, the model is developed to record informational data like plotting the vehicle and receiving alert message about the accident by using GPS as well as GSM using Raspberry Pi. The entire set up is called Black box. The Black box contains a Tilt sensor that sense the tilt angle or movement of the bike in case of accident and activate the framework, send the message to specific server. The webcam records the video at that instant. The recorded video in Black box is especially helpful in identifying the cause of accident. The android application will send an alert message to the nearest medical help centre along with the location with the help of GPS which helps in saving crucial time. This data is also stored in the black box. This stored data is beneficial for the police investigation, hence finding the real culprit.

2. RELATED WORKS

P. Ajay Kumar Reddy, P. Dileep Kumar, K. Bhaskar Reddy, E. Venkataramana, Chandrasekhar Reddy [1] proposed a "Black Box for Vehicles" International Journal of Engineering Inventions The information can be recovered merely after the accident, for investigation. Adding to it, a complete description will be given to the user about the accident, which is saved in the memory. Dheeraj Pawar, Pushpak Poddar [2] proposed "Car Black Box with Speed Control in Desired Areas for Collision Avoidance" ETYASR-Engineering Technology & Applied Science Research. The idea is alike to the black box system in aeroplanes. Which can record data like speed, temperature, location, during accident.

Patricia A. Turner Research Scientist, Laura Higgins Associate Research Scientist Texas A&M University College Station, Texas [3] presented a journal on "Intelligent Transportation System (ITS) Technologies for Motorcycle Crash Prevention and Injury Mitigation." Here few technologies are planned to avoid cases where driver leaves a lane or highway or if the bike overturns, deprived of hitting an object or another vehicle.

MONASH University Accident Research Centre [4] on "Intelligent Transport Systems and Motorcycle Safety" by Megan Bayly, Michael Regan, Simon Hosking. This journal listed the works discovered that few commercially existing ITS are present specially for motorcycles, even though quite a lot of developing technologies were identified. Technical Research Organization India "A Research Paper on Upgraded Black Box for Automobiles" by Sharvin Pingulkar, Haroondeep Singh Sandhu, Jayant. R. Mahajan BE Student [5] The key reason of the journal is to develop a model called Black Box which can be installed in any vehicle used for vehicle investigation.

3. PROPOSED METHODOLOGY

The proposed methodology is distributed into following two parts:

A. Vehicle unit /Black Box-Transmitter

B. Police Control Room/ Hospital/Family Unit -Receiver

The vehicle unit tracks the vehicle using GSM and GPS technology controlled by Raspberry Pi. Figure 1 shows the

block diagram of the proposed model-transmitter unit i.e. smart bike accident detection system reporting with black box. The whole system with transmitter side is called as black box. This system uses Tilt sensor, GPS module, GSM module, Arduino Uno as USB to TTL converter, web camera and Raspberry Pi as processor. whenever the motorcycle starts, at this time the tilt sensor will be in active mode it starts reading the parameter. In this way the tilt sensor will observe the motorcycle performance. The transmitter unit is receiving all the data from the sensor. Raspberry Pi is the heart of the system. Tilt sensor which is connected to the Raspberry Pi will sense tilt angle in the motorcycle. In this system Raspberry Pi has memory card inserted into it. This will save information of every parameter. When the accident occurs, the location of this case will be traced by using GPS technology.

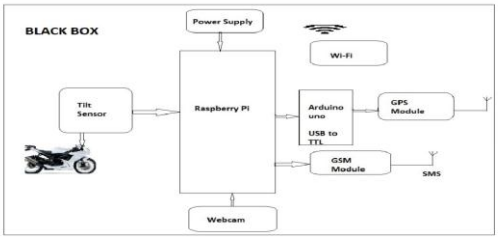

Fig -1: Block Diagram of the Proposed Model-Transmitter

Fig -2: Proposed Model-Receiver

On sensing accident this system will get present location latitude and longitude via google map from GPS module. The android application gives the alert message showing the exact location in the google map. The GSM module will send alert message to the victim's families on a predefined contact number at the same time memory card will store the video captured by the webcam which could be retrieved at service centre for aiding insurance companies during accident investigations and also police investigation. At service centre memory card will be connected to PC to retrieve all the data stored in it.

4. RESULT

A. AT TRANSMITTER END

At transmitter end the bike shall install the proposed system "Black Box". The installation process is as follows.

Fig -3: Transmitter end –Black Box

B. AT THE RECEIVER END

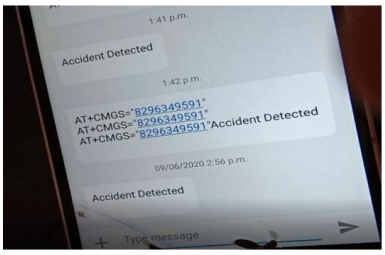

Fig -4: SMS received

Code is written so that it sends a SMS through GSM using ATD commands whenever the tilt sensor is activated. When accident happens, the tilt sensor goes active high, the GSM is programmed to generate SMS to be sent to the contact number which is pre-coded.

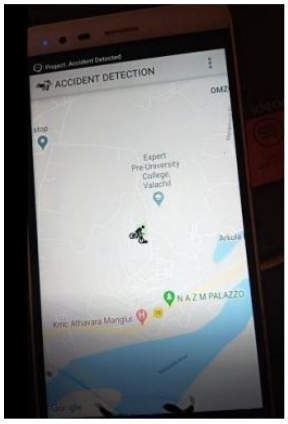

Fig -5: Accident detection app showing the location

5. CONCLUSION AND FUTURE WORK

This paper presents that it benefits the victim of Hit and Run case, also for those who meet an accident in an uninhabited place. Smartphones are used by every single person these days; it can be advantageous in such kind of emergencies.

As a future extension of this work the safety system can be integrated with an algorithm to find the person close to the accident spot which may work as an alternate help.

REFERENCES

[1] P. Ajay Kumar Reddy, P. Dileep Kumar, K. Bhaskar Reddy, E. Venkataramana, Chandrasekhar Reddy on "Black Box for Vehicles" International Journal of Engineering Inventions ISSN:2278-7461, www.ijeijournal.com Volume 1, Issue 7(October 2012) PP:06-12.

[2] Dheeraj Pawar, Pushpak Poddar on "Car Black Box with Speed Control in Desired Areas for Collision Avoidance" ETYASR-Engineering Technology & Applied Science Research Vol.2,0.5,2012, 281-284.

[3] Patricia A. Turner Research Scientist, Laura Higgins Associate Research Scientist Texas A&M University College Station, Texas on "Intelligent Transportation System (ITS) Technologies for Motorcycle Crash Prevention and Injury Mitigation."

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