Biker Safety on Aftermath of Accident

Hari Krishnan M S Sowmya Sandeep Kumar Sahu Sumit Jain
B Tech Student, Dept of ISE, School of Engineering and technology, Jain University, Ramanagara, Karnataka, India
Assistant Professor, Dept of ISE, School of Engineering and technology, Jain University, Ramanagara, Karnataka, India
B. Tech Student, Dept of ISE, School of Engineering and technology, Jain University, Ramanagara, Karnataka, India
B Tech Student, Dept of ISE, School of Engineering and technology, Jain University, Ramanagara, Karnataka, India

***Abstract*-Majority of two wheeler road accidents leading to death is due to lack of immediate first aid after the impact/accident (especially when going alone or solo). There is no recent development on this area (aftermath of an accident). IOT (Internet of Things) is an area of network connectivity which connects physical devices to ensure the communication of real time results. Linking IOT with the current problem statement we ensure the primary requirements of aftermath of the accident. In Majority of two wheeler accidents, rider falls away from the vehicle after the impact and there is no immediate help (first-aid) at that crucial moment, which results in death. The technology which we are presenting ensures the immediate help to the victim after the impact. This technology connects the rider and the vehicle through physical link which in turn wirelessly connects to the smart phone. After the impact the rider falls off the vehicle which disconnects the link from the vehicle. This will send a signal to the connected smart phone which in turn will make panic calls (police, ambulance and priority contacts), send accurate location for tracking and providing immediate help.**

I. INTRODUCTION

Any country's major issue is road safety and providing immediate medical help to the victims of road accidents. The problem is much more serious in India where close to 5,00,000 road accidents caused nearly 1,46,000 deaths and left more than thrice a number injured according to The Ministry of road transport & highways in the last year[3],[4]. For countries like India, which are in a phase of fast development, road safety and the accidents leading to death is a major concern. Authorities or the respective governments, though, put in a lot of effort in coming out with rules and guidelines for motor vehicles and road traffic this may not be enough. This, we say because after an accident has occurred there is usually no immediate medical help given as the people at the accident scene may not be well qualified to do so or mostly hesitant to even call the ambulance due to the fact that they would be caught in legal procedures that follow later. This might have been overcome with the new "Good Samaritan" law, but that hasn't completely ceased to exist.

The technology that we are proposing is concerned with providing all the primary help needed for the victim and reducing the amount of suffering and number of deaths of the victims of two wheeler vehicles, especially those with solo riders.

II. EXISTING IMPLEMENTATIONS

There are many existing technologies for accident detection therefore it is not a new area of development. As every year there is an increase in the vehicle on roads which proportionally increases the number of accidents on roads, though a lot of them are two wheeler, major concern is given to four wheeler and many safety assistance are given to four wheeler like air bags, car alerting system [2] and all.

The technologies supporting riders aftermath of an accidents for initial help are very and are rarely used by the people, and most of them identifies blood pressure, heart rate of the victim which make people less attracted to this field .That's why there is a need to develop a system integrated on the vehicle to support the rider when he a solo mainly.

Fig 1. System being used

III. PROPOSED SYSTEM

As mentioned above in most of the cases people are expert in using mobile apps but mobile apps alone does not solve much of the problem therefore there is a need of using much higher integration which is the mobile device itself and operation system(OS) which makes it run. The technology what we are implementing has a standard framework and is implemented by integrating a hardware component attached to the respective two wheeler where the rider is connected via a physical link same as the concept of a treadmill safety key (There are safety keys that are designed to have one end attached to the clothing. These are beneficial in ensuring you do not get hurt if you fall. When the rider fall while using the machine, the other end of the safety key that is bound to your clothes will pull the other end ensuring that the key gets out and the treadmill stops before you can get hurt).

Same way our technology is also using a safety link which is the integral and most important element of our model where one end of the link is attached to the rider to his clothing while he is riding and the other end acts as a clip attached to the system or model integrated with the vehicle.

The system which is integrated in the vehicle is a compact technology which is made portable with proper safety casing or can be manufactured as a part in the vehicle itself in a later stage. The system has mainly a relay switch circuit, LED's.

Relay is a special type of switch turned on and off by an electromagnet. Relays are switches that open and close circuits electromechanically or electronically. Relays control one electrical circuit by opening and closing contacts in another circuit), there is an open contact when the relay is not energized .The advantage of relays is that it takes a relatively small amount of power to operate the relay coil, but the relay itself can be used to control motors, heaters, lamps or AC circuits which themselves can draw a lot more electrical power.

When the key attached to the vehicle/system gets disconnected or pulled off as a result of the rider falling after the impact as shown in (Fig.1), the relay gets activated mechanically and the signal gets closed and the LED blinks to pass the signal to the respective connected smart phone via Bluetooth or if available internet facility. The user gets a time period of 2 mins to switch of the false alarm in some cases. If the user doesn't respond to the alarm the software part comes into play where our primary requirement is to send sms or make voice calls to share the initial status of the victim to emergency list mentioned by the victim and to share the coordinates to the nearest police station to locate the incident and similarly to the ambulance as shown in (Fig.2).

The app made has special functionalities such as to analyze the overall situation information depending on the features available on the mobile device and as supported by the OS.

- Audio recording – periodic audio recording of short duration intervals.
- Video recording – periodic video recording of short duration intervals.
- GPS location – periodic capture of current GPS location co-ordinates[1],[5].
- Motion information – periodic capture of motion co-ordinates using available motion sensors
- Network information –Network connection, range and distance from network points, battery status, etc. The device will automatically go into power saving mode by turning off features that drain battery such as background app refresh and only the required information will be active.
- Auto dial and messaging – the device can also make automatic calls and send SOS messages to 2 or 3 pre-nominated persons through the app. The calls and messages will not appear in history and neither on the display screen. The calls will be short and periodic.
- Depending on the internet availability all of the above information should be transmitted to central cloud data storage. The information will be as optimized as possible for efficient and speedy transmission. The information should be stored on mobile cache and transmitted whenever the devices find internet access. The information will be transmitted even if the device is switched off or partially damaged (if possible using a back-up battery or something).
- The solution is effective in not only personal emergencies but mass crises situations as well if many of the affected people were to use the emergency feature on their own devices simultaneously. A wealth of highly valuable information would get captured and at disposal of the authorities and the emergency response teams. Relief strategies, medical help, police measures, military actions, etc would be so much more effective and timely if all of this information were to be available in real time.
- If this solution is rightly implemented and configured it does have the potential to save hundreds and thousands of lives every year. It can also prove as a deterrent for anti social activities knowing everyone is equipped with a powerful emergency protection system.

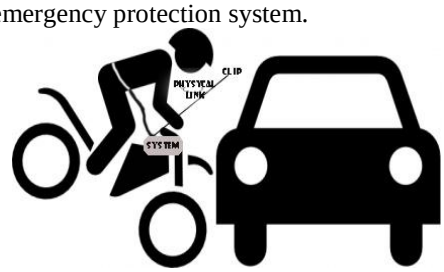

Fig 2. System Setup

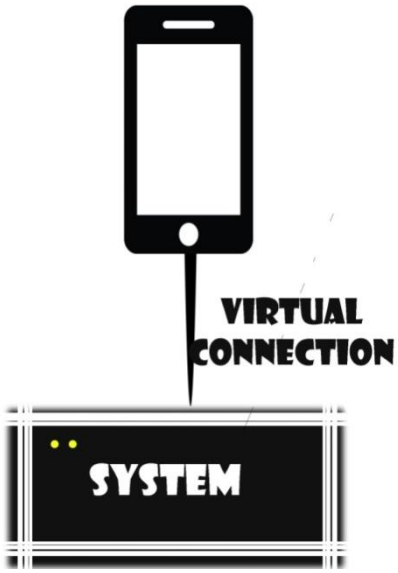

Fig 3. Connection with Smartphone

IV. FUTURE STEPS

As of today one in 5 people or around 1.75 billion people in the world own a Smart phone and or a smart device. A large proportion of those also have internet access on their devices. Mobile devices and smart gadgets have become an integral part of human accessory which they carry with them almost all the time. It is estimate that around 80% of people have their Smart phone with them 22 hours a day. As India is moving towards digital world and it is necessary to maintain all the records digitally.

Smart phone features and operating systems have become extremely advanced and support wide array of

features such as high resolution cameras, audio recording, temperature and pressure sensors, health sensors, instant communication capabilities, accurate geolocation mapping, etc. Cloud storage provides almost infinite data storage and retrieval capabilities and are constantly synchronized with mobile devices through internet. As people are living in a fast and dynamic environment they prefer everything to be simple and reliable.

Our technology is the one which confirms the required needs without any drawbacks. We can develop our technology in such a way that it can be used for security purpose also which can send alarm signals to the user if there is any robbery attempt. One more integration is that, as road accidents are increasing day by day there is a need to keep a track record to take sufficient action or to formulate a law; our technology can be used to maintain a database on this.

V. CONCLUSION

The technology proposed describes the problems faced by the two wheeler rider aftermath road accidents where most of the deaths happen due to lack of immediate primary help to the victim which is a major problem for which we have proposed an idea of an automated system to provide initial help to the rider. The system proposed is very reliable and simple with a compact and portable system connected via a Smart phone for the real time data communication with several features .Using this technology we can overcome the death of many victims after impact if at all there is any human error by the authority or the police.

This if implemented especially in Indian conditions by the government as a compulsory two wheeler component can reduce many deaths and can help the authorities to keep a track record to check the and maintain the measures to overcome the road accidents.

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