IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

ACCIDENT REPORTING SYSTEM USING MACHINE LEARNING

[1]Arokiaraj Christian St Hubert, [2]Sudha M, [3]Keerthana R

[1]Assistant Professor
[1]Department of Computer Science and Engineering,
Sri Manakula Vinayagar Engineering College
[1]Puducherry, India

Abstract: Artificial intelligence (AI) is the simulation of human intelligence processes by machines, especially computer systems. Specific applications of AI include expert systems, natural language processing (NLP), speech recognition, and machine learning. Automatic Number Plate Recognition (ANPR) is an image processing technology that uses a number (license) plate to identify the vehicle.[3] with No extension to transferring data, Lack of structure completion, and no notifications to the help center. ARS is a mobile application - which reports the event of an accident. Includes victim's vehicle plate detection using OCR.

Index Terms **- Optical character recognition, Number plate, Vehicle, Accident reporting system.**

I. INTRODUCTION

The emergency of applications such as Google Chrome, Music, Games, and more are led by the introduction of operating systems on smartphones. A wide range of sensors is introduced and built to store a large amount of data with powerful computing units and communication modules as a result of the heavy competition between smartphone producers. Microphones, high-resolution cameras, GPS receivers with Wi-Fi services, etc. are present in today's smartphones. [1]They are helpful in monitoring, detecting, guiding, and reporting accidents in many applications. The smartphones are helpful in tracking the vehicles, determining the speed, and provide traffic at a less cost compared to the loop detectors. [2]There is no need for any specialized hardware for detection as smartphones are easily accessible to most users. The important feature being discussed by application developers is to reduce the false positives in smartphone detection and reporting systems. [3]There is a massive number of accidental calls reported by emergency services. It is important to reduce the false rate of detecting and reporting accidents.

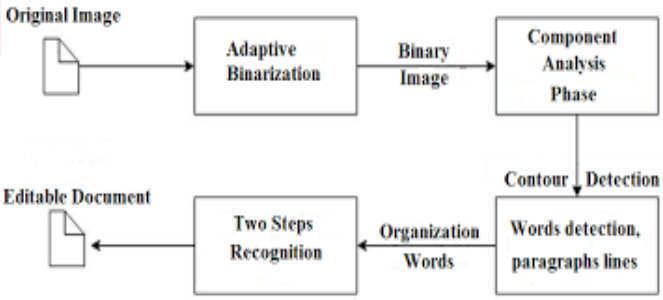

Fig. 1.1. Basic Web App architecture

II. RELATED WORKS

The proposed system in [4] was presented with an accident detection system automatically involving two-wheeler vehicles to send information if any accident occurred including the angle of accident, time, and location. So the rescue teams like police stations and medical hospitals are intimated for first aid.

2.1. Mobile Applications Detecting and Reporting Accidents

In the attempt to eliminate the false positive of an accident, various methods are integrated, such as: combining the data provided by the smartphone sensors (accelerometer, microphone, GPS, gyroscope, camera, etc.) with vehicle data collection (airbags, GPS position, etc.) by wireless communication (Wi-Fi, Bluetooth, OBD-II platform, and VANET) or the additional use of a Kalman filter. In this section, we offer some existing applications which can be used in the event of an accident (road accidents, falls, etc.).

The paper [5] describes how smartphones can automatically detect a road accident, relying on data processing capability and built-in sensors without direct interaction with vehicle sensors. For this purpose, a mobile application called Wreck Wat Inch has been proposed that uses the accelerometer and microphone for accident detection and defines a formula based on which an accident.

2.2. Accident Detecting Systems for vehicle

Over the past years, accident prevention and detection systems have been studied and implemented on a large scale. Thus, various integrated automatic detection and notification systems have been developed at the time of vehicle traffic accidents. One of these systems is OnStar [4] being available only to Opel or Vauxhall car owners. This system has been running since the 1990s in the United States and since 2016 it has been introduced in Europe in thirteen countries.

The framework gives help for all crises as well as other help (area, car information, vehicle conclusion, etc.). A disadvantage of this system is the impossibility to cancel the call to the emergency service if the SOS button has been accidentally pressed. Even if the integrated systems in the vehicle are working well, they are expensive and not available for monitoring older vehicles.

III. Optical Character Recognition Algorithm

The performance of OCR models draws on multilayer artificial neural networks. For computer vision, the foremost common sorts are repetitive neural systems (RNN) or more absolutely long short-term memory (LSTM), and convolutional neural systems (CNN).

The working principle of RNN is to save the output of a layer and then feed it back as the input. Such architecture makes it easy to predict the outcome of the layer. CNN is a feed forward type of neural network. The information flows through the network, and the output of the model isn't used again as the input. The usage of one or another type of NN is determined by a problem to solve. OCR computer program frequently "pre-process" pictures to boost the chances of recognition. Techniques include:

1. De-skew If the archive was not accurately adjusted when filtered, it may have to be tilted a number of degrees clockwise or counter clockwise to make content lines totally even or vertical.
2. Despeckle Remove positive and negative spots, smoothing edges.
3. Binarization Convert a picture to black-and-white (called a "binary image" since there are two colours). The binarization errand is conducted as a simple and precise way to recognize content (or any other required picture component) from the background.
4. Line removal Cleans up non-glyph boxes and lines.
5. Format examination or "zoning" Identifies columns, passages, captions, etc., as squares. Especially valuable in multi-column formats and tables.
6. Line and word detection Establish word and character shapes standard, isolating words when required.
7. Script recognition In different dialect archives, the script may change at the word level and thus script distinguishing proof is crucial some time recently the significant OCR can be utilized to oversee the specific script.
8. Character confinement or "segmentation" For OCR characters, different characters connected by picture artefacts ought to be separated, single characters broken into a few artefact-based pieces ought to be linked.
9. Normalization Normalize perspective proportion and scale. Feature Extraction.

There are two fundamental strategies for extricating highlights in OCR: Within the to begin with strategy, the calculation for include location characterizes a character by assessing its lines and strokes. In the moment strategy, design recognition works by recognizing the whole character. We can recognize a line of content by looking for white pixel rows that have dark pixels in between. So also, we will recognize where a character begins and finishes. The taking after pictures appear the visualization of these strategies respectively:

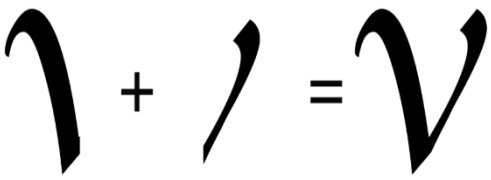

Fig 3.1. Method 1- Feature Extraction

Fig 3.2. Method 2- Patter Recognition on a row effect

Fig 3.3. Method 2- Patter Recognition on a single character

Following, we change over the picture of the character into a double lattice where white pixels are 0s and dark pixels are 1s as appeared within the taking after image:

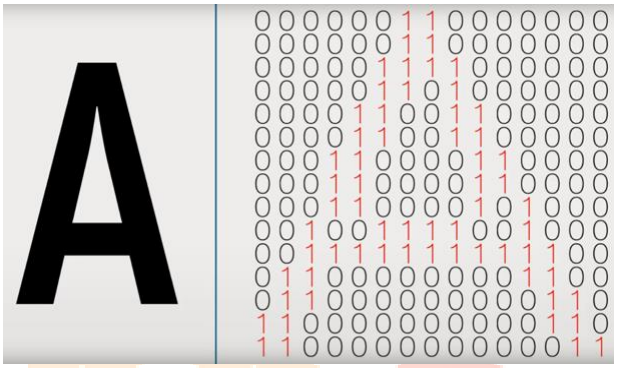

Fig 3.4. Sample of Binary matrix

At that point, by utilizing the separate equation, we are able discover the remove from the center of the lattice to the most remote 1.

$$d = \sqrt{(y_2 - y_1)^2 + (x_2 - x_1)^2}$$

Fig 3.5. The Distance formula

We at that point make a circle of that sweep and part it up into more granular sections. At this arrange, the calculation compares each subsection to a database of networks speaking to characters with distinctive textual styles to distinguish the character it has most in common statistically. It makes it simple to bring printed media into the advanced world by doing this for each line and character.

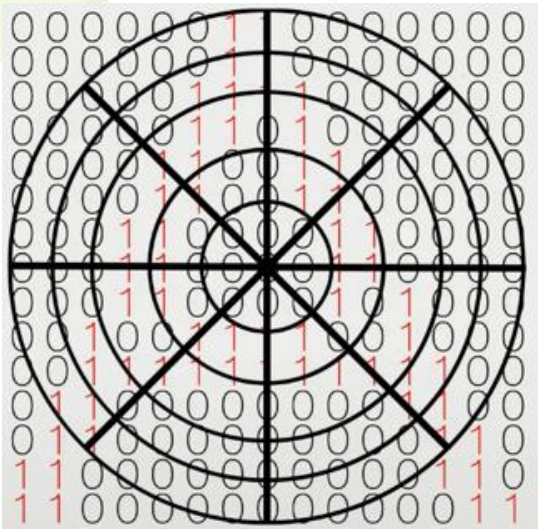

Fig 3.6. Compare each subsection against the matric database

Post-processing OCR exactness can be moved forward on the off chance that the yield is restricted by a dictionary (a list of words allowed in a record). For occasion, this may well be all the words in English, or a more specialized vocabulary for a specific field. This strategy can be less proficient if the record contains words that are not within the dictionary, like proper nouns. Fortunately, to progress precision, there are OCR libraries accessible online for gratis. The Tesseract library is utilizing its word reference to control the division of characters.

The yield stream can be a single string or a character record, but more progressed OCR frameworks hold the first page structure and, for case, create a PDF containing both the first picture pages and a searchable literary image.

IV. MODEL OF EXISTING SYSTEM

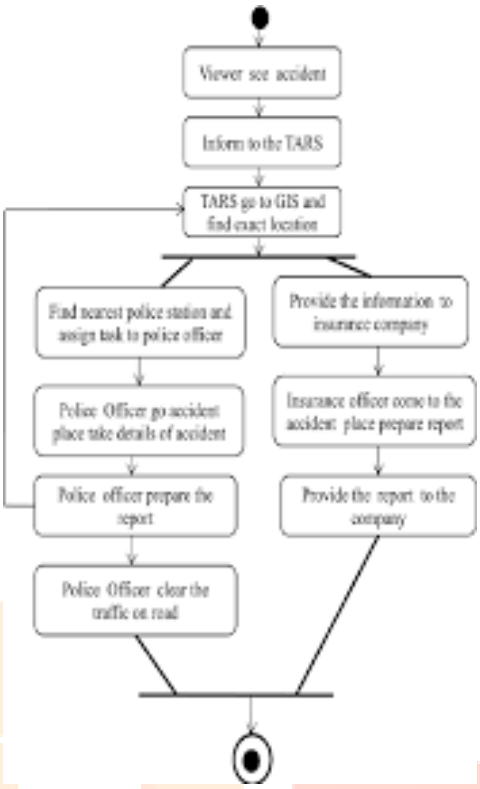

Fig 4.1. Block diagram of Existing System

On the off chance that three occasions happen: the airbag is activated, the car upsets, or the vehicle collides, the proposed calculation identifies an mishap. A caution flag is sent through the IT2S stage when an mishap is identified. All adjacent cars get an computerized street risk caution alarm. The moment caution flag is sent to the crisis administrations. Within the proposed paper [11], Akshay Agrawal et al. display an thought for creating a car mischance forecast framework utilizing an versatile calculation. The point of such an app is to help within the sparing of lives by alarming you to an mishap. The creators recommended that any kind of computer be utilized to identify mishaps utilizing an versatile algorithm. Since the gadget is an Android application, it'll be cheap, reasonable for low-end cars, and available in any nation much appreciated to Android Advertise app uploading. When an mishap happens, the proposed gadget identifies it, records the occasions with the front and fundamental cameras, and sends an SMS to the predefined contact numbers.

Yue Shi et al. propose a modern mischance discovery concept in their paper [12], which employments the highlights of a five-phase show to alter the status of the user's development amid the drop. The thought behind drop discovery is to utilize information from smartphone sensors to calculate speeding up (such as accelerometers and whirligigs). Modern highlights determined from a five-phase demonstrate outlining the multi-stage drop prepare will be utilized. A exhibit application called uCare, which runs on the Android working framework, was made with the point of helping individuals in anticipating and recognizing falls. Huang, Chuen-Min, et al. propose a handheld terminal-based instrument for identifying and checking bike mischances [13]. The proposed gadget employments different smartphone sensors such as an accelerometer (G sensor) for recognizable proof, GPRS, Google Maps, and GPS for observing and informing the crash within the occasion of an mishap. Different speculations were examined, and an Android portable application named GoGoBike wa

Dr. Apps [14] has discharged Mischance Report, a free portable application that runs on smartphones with the Android working framework. This is often a crash program that accumulates different sorts of information in order to create a complex report within the frame of a PDF record that can be messaged. Drawing the damage to the car, shooting the cars, getting the area, filling within the individual subtle elements, subtle elements of the accident, and data on the witnesses included, and being mindful of the other party included within the mischance are all steps included in making a report.

V. PROPOSED WORK

ARS may be a versatile application - which reports the occasion of an mishap. Incorporates victim's vehicle plate discovery utilizing OCR. Moment area following shows the outline, includes markers to move the user's particular outline range. For enlisted clients: - Making calls and messages to the crisis contacts within the given list - And inform the nearby clinic. For modern clients: Since the permit plate number isn't enrolled and the app will offer assistance to call the adjacent hospital. Advantages: Mobile application supporting both android and ios users. Notify contacts, offer assistance centres. Both witness and casualty passages can be done.

'The Mischance Detailing Framework is outlined to assist the casualty and the client by sending the current mischance area to the closest clinic and makes calls to the crisis contacts within the given list. This application is planned to protect the casualty

enduring from the mishap. The proposed frameworks are Enrol report and Coordinate report utilizing an application. The system incorporates. This framework can also help individuals met with street mishaps to realize restorative bolster maintaining a strategic distance from much delay. Too, to keep educated by other individuals by sending messages at standard interims to the authorized numbers. Healing center and Transportation etc. This application is more supportive and valuable for casualties in provincial zones or populated ranges. The most advantage of this framework is that it gives moment clinic benefit and moment area following of where the mischance has happened. In this way, the most require for application is in clinics and for human life security.

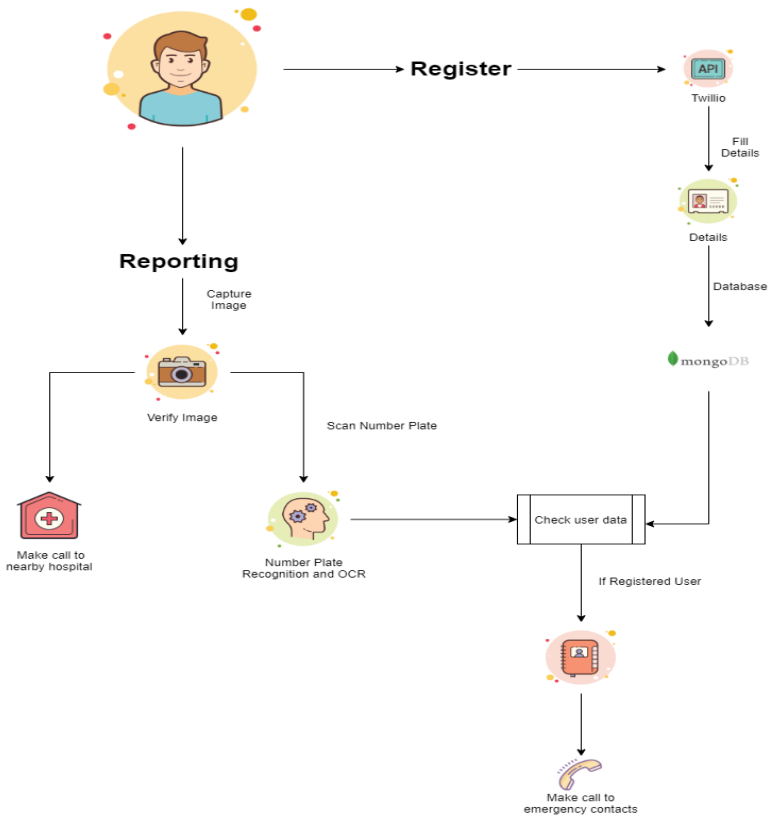

Fig 5.1. The Functionality of the proposed work

The mischance discovery and announcing framework gives basic data to crisis administrations as before long as conceivable. It is conceivable to play down passing rates by shortening the time between when an mishap happens and when it is found. To guarantee the car's usefulness and unwavering quality, the entire venture must be coordinates with it. As a result, this investigate would offer assistance to diminish the number of individuals who kick the bucket in car mishaps. At that point it is greatly critical in people's everyday lives in a nation like India. Indeed in a inadequately populated environment, the arranged work would incorporate basic points of interest around the incidents.

As appeared in this paper, smartphones can identify the event of an mishap, but the most issues stay the tall rate of untrue discovery. Diverse from other frameworks, our framework will learn the user's daily behaviour. For this, we are able utilize diverse machine learning algorithms such as neural systems [23], bolster vector machines (SVM), or choice tree. Within the beginning, the framework will work within the learning stage and after that, it can be utilized to play down untrue discovery. Based on the inquire about displayed, it has been found that the Android working framework is open-source, more permissive with the utilize of implanted sensors, and phones with this working framework are much cheaper than iPhone smartphones. In this manner, Android will be utilized as the most stage for planning and sending the exhibit application, for executing administrations, mishap discovery, and crisis occasions.

VI. IMPLEMENTATION AND RESULT

- Realtime Database (MongoDB)
- Optical character recognition
- Flutter
- Google API services

Created collection ARSDetails. With attributes - username, email, license number, password, contact.

Fig 6.1. Database Entry

Optical character recognition or optical character reader is the electronic or mechanical conversion of images. An image processing technology that uses a number (license) plate to identify the vehicle. Detect and localize a license plate in an input image/frame.

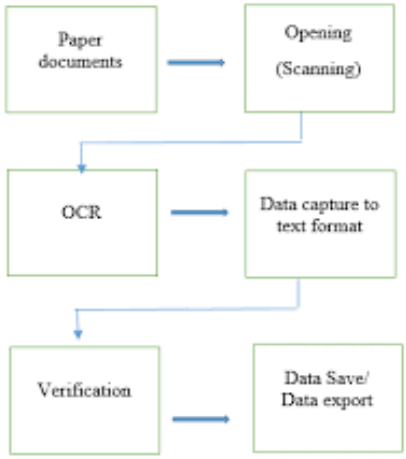

Fig 6.2. Object character recognition from images

Extract the characters from the license plate.

Google's portable UI toolkit - natively compiled applications for mobile, web, and desktop. Uses a single codebase.

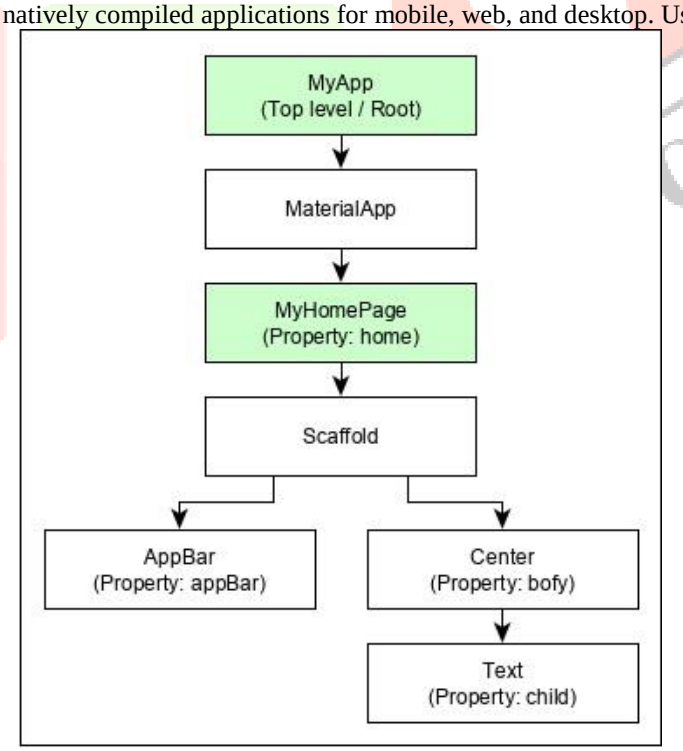

Fig 6.3. ARS Flutter app architecture

Develop applications for Android and iOS. Google Maps Android API - a service that is part of the Google Play services library.

Allows access to Google Maps server automatically, displaying map downloading data, and map gesture response. Allows to add markers, polygons, and basic map overlays, and to transition the user's context of a specific map area.

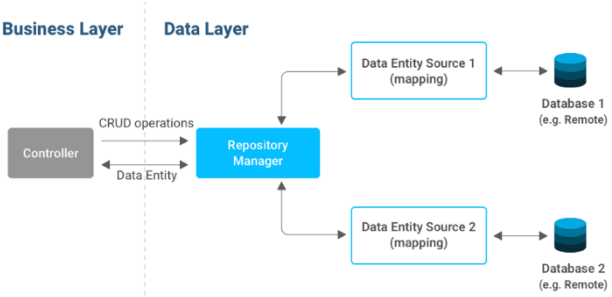

Fig 6.4. ARS application's functionality architecture

Google Location API- Provides new features like activity detection. Automatically chooses a suitable location provider and power management.

VII. CONCLUSION

This project has a series of systems used in case of an accident based on mobile terminals such as smartphones and the importance of their use in emergency situations. For each system it is highlighted how it works, the operating system on which applications are running, and the main advantages and disadvantages. Some of the existing applications for detecting an accident using smartphone built-in sensors. The user can choose the desired application, considering several features such as the phone's operating system, the sensors used for detection, and the additional features offered by each application.

REFERENCES

[1] V. Goud, "Vehicle Accident Automatic Detection and Remote Alarm Device", International Journal of Reconfigurable and Embedded Systems (IJRES), Vol. 1, no. 2, 2012.

[2] B. Prachi, D. Kasturi and C. Priyanka, "Intelligent Accident-Detection And Ambulance- Rescue System", International Journal Of Scientific & Technology Research, Vol. 3, No. 6, 2016.

[3] Xinhua Shu, Zhenjun Du and Rong Chen, "Research on Mobile Location Service Design Based on Android", 5th International Conference On Wireless Communication Networking and Mobile Computing, Beijing, pp. 1-4, 2009.

[4] OnStar System, Official site Opel, Available: http://www.opel.ro/onstar/onstar.html.

[5] Jules White, Chris Thompson, Hamilton Turner, Brian Dougherty, and Douglas C. Schmidt, "WreckWatch: Automatic Traffic Accident Detection and Notification with Smartphones", Mobile Networks and Applications, DOI: 10.1007/s11036-011-0304-8, June 2011.

[6] Chalermpol Saiprasert and Wasan Pattara-Atikom, "Smartphone Enabled Dangerous Driving Report System", 46th Hawaii International Conference on System Sciences, DOI: 10.1109/HICSS.2013.484, 2013.

[7] Hamid M. Ali et al, "Car accident detection and notification system using smartphone", International Journal of Computer Science and Mobile Computing, Vol.4 Issue.4, April- 2015, pg. 620-635, ISSN 2320–088X.

[8] F.J. Bruwer and M.J.(Thinus) Booysen, "Vehicle acceleration estimation using smartphone-based sensors", Conference: South African Transport Conference, At Pretoria, July 2015, DOI 10.13140/RG.2.1.3244.4640.

[9] Bruno Fernandes, Vitor Gomes, Joaquim Ferreira and Arnaldo Oliveira, "Mobile application for automatic accident detection and multimodal alert", IEEE Vehicular Technology Conference, At Glasgow, July 2015, DOI: 10.1109/VTCSpring.2015.7145935.

[10] Akshay Agrawal, Anand Khinvasara, Mitali Bhokare, Sumit Kaulkar, Prof. Y. K. Sharma, "Accident detection system application", International Journal of Emerging Technologies in Computational and Applied Sciences (IJETCAS), Issue 6 Volume 5, pp. 425-428, ISSN: 2279-0055.

[11] Arsalan Khan, Farzana Bibi, Muhammad Dilshad, Salman Ahmed, Zia Ullah," Accident Detection and Smart Rescue System using Android Smartphone with Real-Time Location Tracking", International Journal of Advanced Computer Science and Applications, Vol. 9, No. 6, 2018.

[12] Yue Shi, Yuanchun Shi, Xia Wang, "Fall Detection on Mobile Phones Using Features from A Five-phase Model", Ubiquitous Intelligence & Computing and 9th International Conference on Autonomic & Trusted Computing (UIC/ATC), October 2012, DOI: 10.1109/UICATC.2012.100.

[13] Chuen-Min Huang, Yen Chang. "A mobile-based novice accident detection and tracking system for bicycle", Available:https://www.researchgate.net/publication/267977300_A_MOBILE-BASED_NOVICE_ACCIDENT_DETECTION_AND_TRACKI NG_SYSTEM_FOR_BICYCLE.

[14]Accident Report Application (2015), Available online: https://play.google.com/store/apps/details?id=com.rany.accidentreport.en, Developer of the application Drapps, Available online: http://drapps.info/.

[15] Beat the Traffic application (2017), Available online: http://www.appsapk.com/beat-the-traffic/. [16] SOSmart application (2017), Available online: http://www.sosmartapp.com/.

[16] National Highway Traffic Safety Administration, Available online: https://www.nhtsa.gov/.

[17] INRIX application (2016), Available online: http://inrix.com/mobileapps/.

[18] Crash Notifier (2017), Developer of the application: R Systems International Limited, Available online: http://www.rsystems.com/.

[19] AxiKit application, Available online: http://www.axikit.com/fleet#AxiKit-Mobile-App.

[20] Cradar Application, Available online: http://actionxl.com/CRADAR.html.

[21] 10 Leading Causes of Death, West 2000 - 2015, Available online:https://webappa.cdc.gov/cgi-bin/broker.exe.

[22] M. Soltane, M. Ismail, ZAA Rashis. "Artificial Neural Network Approach to PPG Signal Classification", International Journal of Computing and Information Science, Vol 2. No 1 2004, pp. 58-65.