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AN IOT BASED SMART EMERGENCY RESCUE OPERATION SYSTEM WITH REAL TIME LOCATION TRACKING.

Pooja Dagadkhair[1], Kalyani Shinde[2], Prajakta Hole[3], Shubhangi Shelke[4]

[1]*Assist. Prof., Department of Computer Engineering, G.H.RAISONI Engineering College, Chas, Ahmednagar, India*
[2] *U.G. Student, Department of Computer Engineering, G.H.RAISONI Engineering College, Chas, Ahmednagar, India*
[3] *U.G. Student, Department of Computer Engineering, G.H.RAISONI Engineering College, Chas, Ahmednagar, India*
[4] *U.G. Student, Department of Computer Engineering, G.H.RAISONI Engineering College, Chas, Ahmednagar, India*

Abstract: *Internet of Things (IoT) is a technology where physical devices are embedded with software, sensors, actuators and communication is take place through existing internet infrastructure. Basic vision behind IoT is minimize the human intervention. IoT become helpful for making a lifesaver system. IoT also give contribution in medical services.This system is mainly designed for the vehicular emergency.When vehicle get trapped in any of the emergency conditions then system starts and work as per the conditions get introduced.After an incident occur,the system communicates with the control room and shares the critical information.The control room analyze the situation and according to the emergency type handle the situation and convey to the rescue system.In this system there is a bi-directional communication occur. Usability of real-time multimedia communication, real-time location tracking etc. have also been integrated to the proposed system to monitor the exact condition in real-time basis. In proposed system prototype we use Raspberry Pi 3 processor.*

Keywords- *Internet Of Things; Smart City; Emergency Location Tracking; Emergency Rescue System; Raspberry pi*

I. INTRODUCTION

Internet is the media which is used for easily communicate and share information. Now a days we are moving towards smart planet where every device will be connected to each other. IoT is one of the best emerging technology help to achieve the goal of smart world. Many smart systems design with Internet of Things (IoT) achieve the goal of a smart city.

A. Need of developing system for vehicular emergency communication System

Developing vehicular emergency system is important for smart city development. In IoT based system every device communicate with each 24 x 7 in Ubiquitous network. Communication between devices take place using communication protocol and their hardware and software infrastructure. Direct interaction between physical devices and computer based system is rapidly growing to make the system more intelligent and accurate in nature. In this paper, we have used the concept of an IoT and smart city to implement the concept of vehicular emergency system for emergency situation occurred on road.

B. Novelties of the Proposed System

In this paper, we have introduced a system which help to avoid any vehicular emergency situation. Reason behind the developing this system is to minimize damages after any unfortunate situation occur with vehicle.
For minimize the damages, we place the small embedded system in vehicle which directly communicate to control room and rescue center. It send the message to control room when any emergency occur. When a vehicle meets any emergency situation the system starts automatically or manually. According to the type of the situation system sends emergency message to the control room. Control room analyse message content and then forwards the message to the appropriate and nearest rescue center.

II. RELATED WORK

In smart city, traffic and road security is important issue hence some researchers studied on that issue. GPS based location tracking system is used to gather location information by using SMS, but in that system some bugs are occurred .User has to start the system manually, it is not fully automated system. Some researchers discussed the impact of Intelligent Transportation System (ITS) for future intelligent vehicle machines.

Thompson, Chris, et al. in that with help of smart phone's sensors can detect an accident in that system, e.g. accelerometer, sensor etc. 3G connection can be used to transmit accident reaction. But the system is not integrated into vehicle and also not fully automated and sometime need third party reporter to send complete emergency information along with photos.

From General Motors provides smart assistance to their vehicles by providing driving assistance, navigation service and route direction to its customers. It also provides emergency communication services through its always connected 4G connection. But with OnStar, the user can only contact the vehicle's manufacturer or emergency numbers (e.g. 911) and not to the local emergency rescue center's that can cause a delay in rescue.

Authors introduced ARRS that can automatically detect an accident and report it. They have used image processing approach to detect a vehicular crash from CC Camera videos. But the main problem of this kind of system is the accidents can't be detected in absence of a camera.

Most of these kinds of systems are dependent on the users' smart phones and are not always automated. Some of them are entirely proprietary product for their own cars and on emergency, they can connect to their call centers only. There is no provision for those solutions to contact nearest rescue centers directly for emergencies that causes delay in rescue mission.

III. LITERATURE SURVEY

1. Subha Koley, Prasun Ghosal, "An IoT Enabled Real-Time Communication and Location Tracking System for Vehicular Emergency", 2017

The rapid growth of technology and infrastructure has made our lives easier. The advent of technology has also increased the traffic hazards and the road accidents take place frequently which causes huge loss of life and property because of the poor emergency facilities. The accident detection project will provide an optimum solution to this drawback. An accelerometer can be used in a car alarm application so that dangerous driving can be detected. It can be used as a crash or rollover detector of the vehicle during and after a crash. Internet of Things is an emerging technology having the ability to change the way we live.

2. A. Zanella, N. Bui, A. Castellani, L. Vangelista, and M. Zorzi, "Internet of things for Smart Cities," Internet of Things Journal, IEEE, 2014

The Internet of Things (IoT) shall be able to incorporate transparently and seamlessly a large number of different and heterogeneous end systems, while providing open access to selected subsets of data for the development of a plethora of digital services. Building a general architecture for the IoT is hence a very complex task, mainly because of the extremely large variety of devices, link layer technologies, and services that may be involved in such a system. It focus specifically to an urban IoT systems that, while still being quite a broad category, are characterized by their specific application domain. Furthermore, present and discuss the technical solutions and best-practice guidelines adopted in the Padova Smart City project, a proof of concept deployment of an IoT island in the city of Padova, Italy, performed in collaboration with the city municipality

3. Shamshul Bahar and Junzo Watada, "Reliability enhancement of a traffic signal light system using a mean variance approach," IEEE Transactions on Intelligent Transportation Systems, 2012.

Traffic accidents cause tragic loss of life, property damage and substantial congestion to transportation systems. A large percentage of crashes occur at or near intersections. Therefore, traffic signals are often used to improve traffic safety and operations. The objective of this study is to present a significant and effective method of determining the optimal investment involved in retrofitting signals with light emitting diode (LED) units. In this study, the reliability and risks of each unit are evaluated using a variance-covariance matrix, and the effects and expenses of replacement are analysed. The mean-variance analysis is formulated as a mathematical program with the objectives of minimizing the risk and maximizing the expected return. Finally, a structural learning model of a mutual connection neural network is proposed to solve problems defined by mixed-integer quadratic programming, and this model is employed in the mean variance analysis. This method is applied to an LED signal retrofitting problem. This method enables us to select results more effectively and enhance decision-making.

4. L. Atzori, A. Iera, and G. Morabito, "The Internet of Things: A Survey, Computer Networks, 2010

This addresses the Internet of Things. Main enabling factor of this promising paradigm is the integration of several technologies and communications solutions. Identification and tracking technologies, wired and wireless sensor and actuator networks, enhanced communication protocols (shared with the Next Generation Internet), and distributed intelligence for smart objects are just the most relevant. As one can easily imagine, any serious contribution to the advance of the Internet of Things must necessarily be the result of synergetic activities conducted in different fields of knowledge, such as telecommunications, informatics, electronics and social science. In such a complex scenario, this survey is directed to those who want to approach this complex discipline and contribute to its development. Different visions of this Internet of Things paradigm are reported and enabling technologies reviewed. What emerges is that still major issues shall be faced by the research community. The most relevant among them are addressed in details.

IV. PROPOSED SYSTEM

1. Software Pre-requisites:

The basic and initial software requirements are as follows,

(a) Rasbian Pi OS
(b) Android Studio
(c) NetBeans
(d) JDK 1.8.0
(e) Windows 8 operating system

2. Input process:

a) When vehicle get trap in any emergency problem such as accident, medical, criminal, civil and mechanical then emergency message is send to the control room.

b) The message contains vehicle information such as location, Emergency type, and Initial pics.

3. Processing:

a) The control room has the task of managing the any type of emergency occur on road.

b) Control room receives message come from vehicle side then it locate the nearest rescue center according to type of emergency.

c) It has its separate database containing information of different rescue centers like hospitals, police station, car workshop, govt.office and it also contains location of several rescue centers.

4. Output process:

a) The rescue system receives the message come from control room and then they send their rescue team to emergency location.

b) They analyse the situation and handle according to type of emergency issues.

c) Message extraction is done in these sytem and after analysing the photos of situation, it can better understand the real scenario of the situation.

5. Testing:

(a) The hardware module and the system is thoroughly tested using various hardware and software testing techniques.

(b) At each module testing is done in order to create a reliable system and useful interactive characteristics builder.

V. THE OPERATION OF THE SYSTEM

1. **Project task set:**

A. Task 1:Send Emergency Message To Control Room
B. Task 2:Send Emergency Message To Rescue Center
C. Task 3:Send Acknowledgement To Control Room
D. Task 4: Send Acknowledgement To User

1. Send Emergency Message To Control Room: When vehicle meets accident or any emergency then System can be activate and send message (type, location, image, information) to the control room.

2. Send Emergency Message To Rescue Center: After sending message to the control room, Control Room send message to the near rescue center according to type.

3. Send Acknowledgement to Control Room: Rescue center send the acknowledgement to the Control room. E.g. they will reach within seconds.

4. **Send Acknowledgement to User**: Sending the Acknowledgement to the control room, after that Control room also send the acknowledgement to the user.

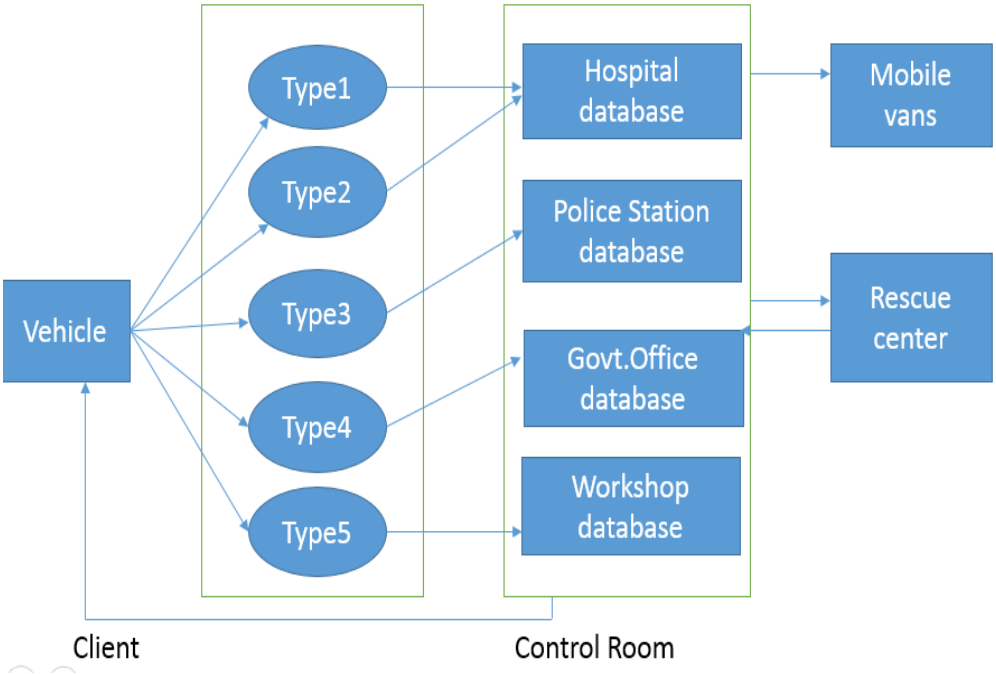


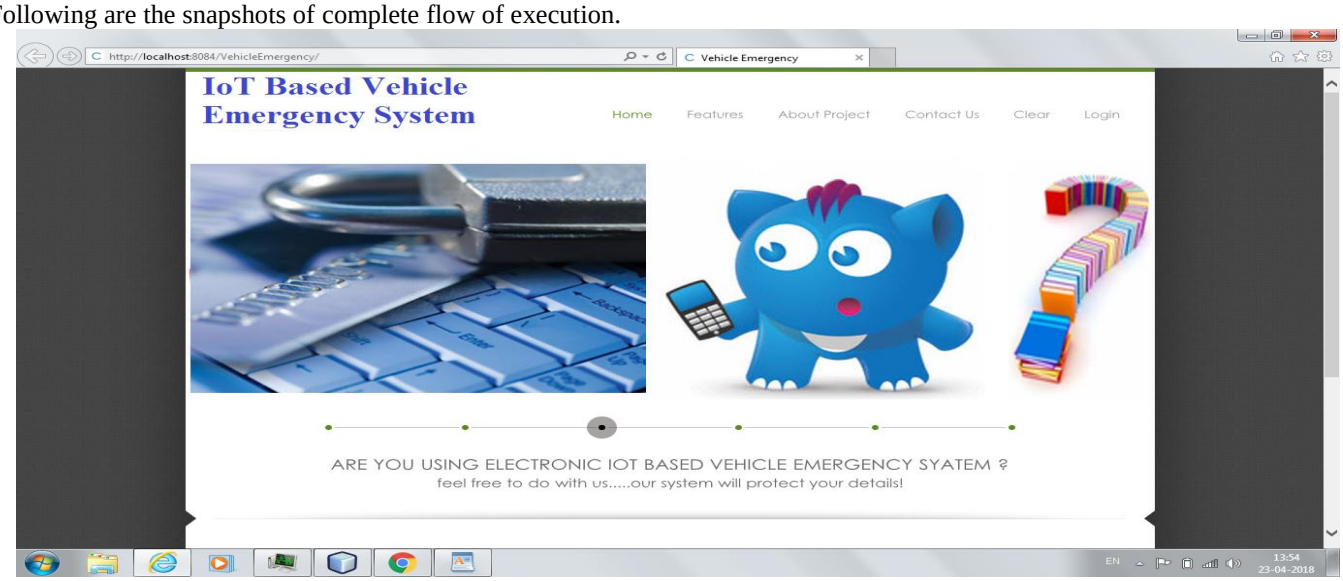
Fig. System Architecture

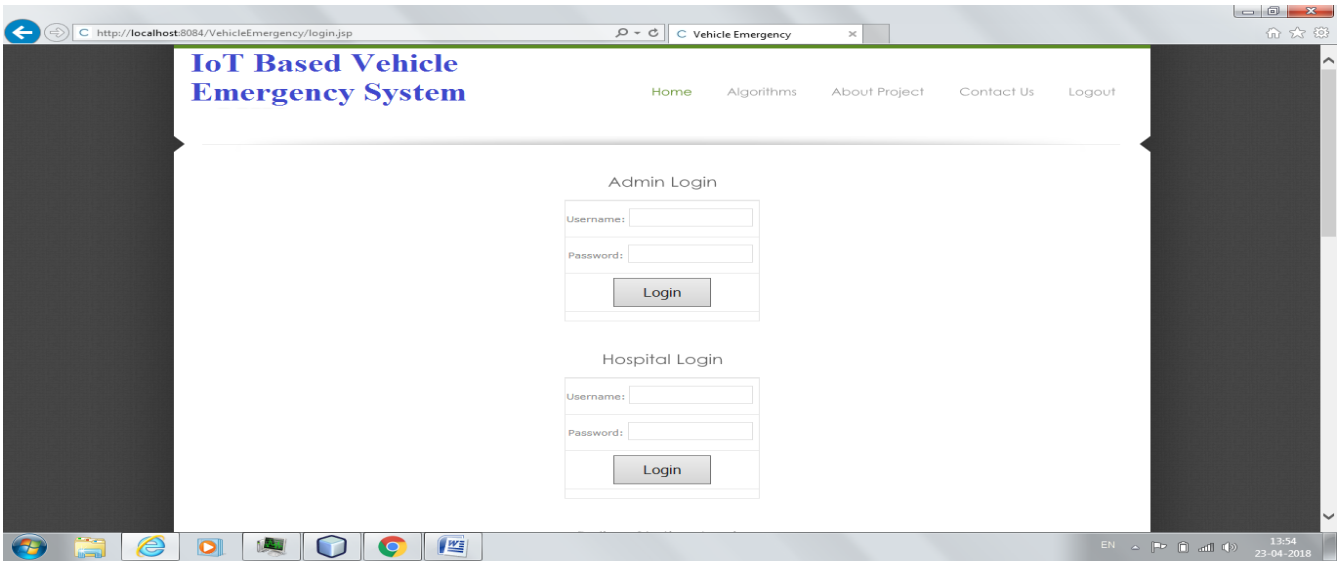
VI. CONCLUSION

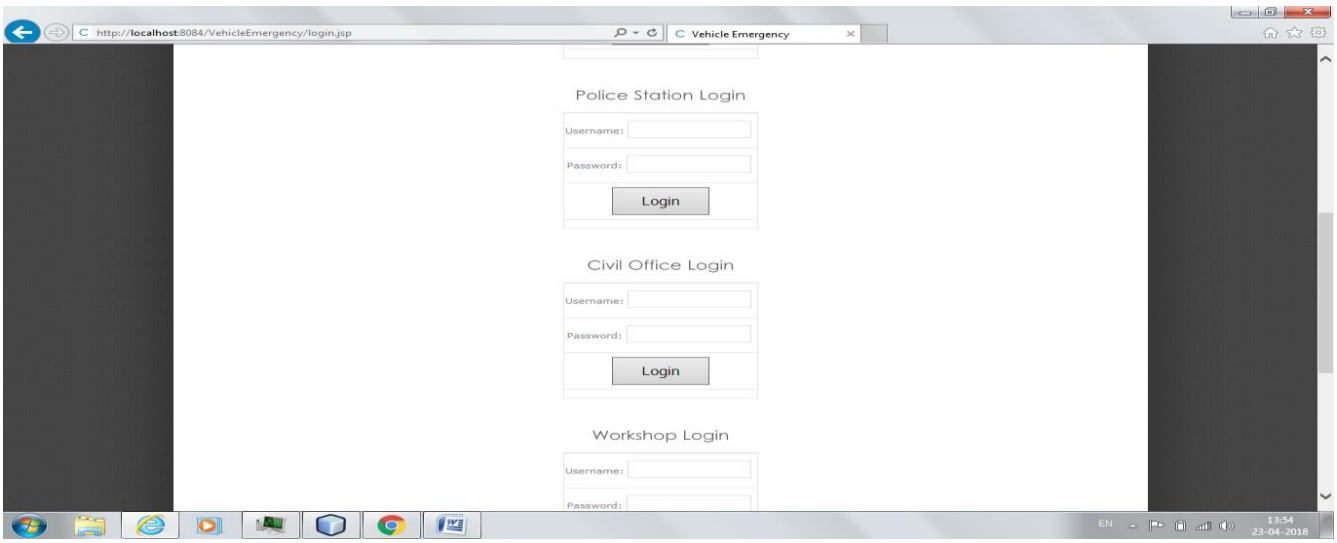
The emergency communication system sends message of information of vehicle to the control room. This system is applicable for vehicular emergency occur on road. It help us to reduce the accidental damage. This is designed for IOT enabled vehicles and for smart cities. The various modules are interacting with each other and also rescue system is sending acknowledgement to the control room and user side. However, this system may also be used with existing infrastructure in any cities. This proposed system has the ability to send emergency information of a vehicle to nearest rescue centers and avoid the various emergency issues.

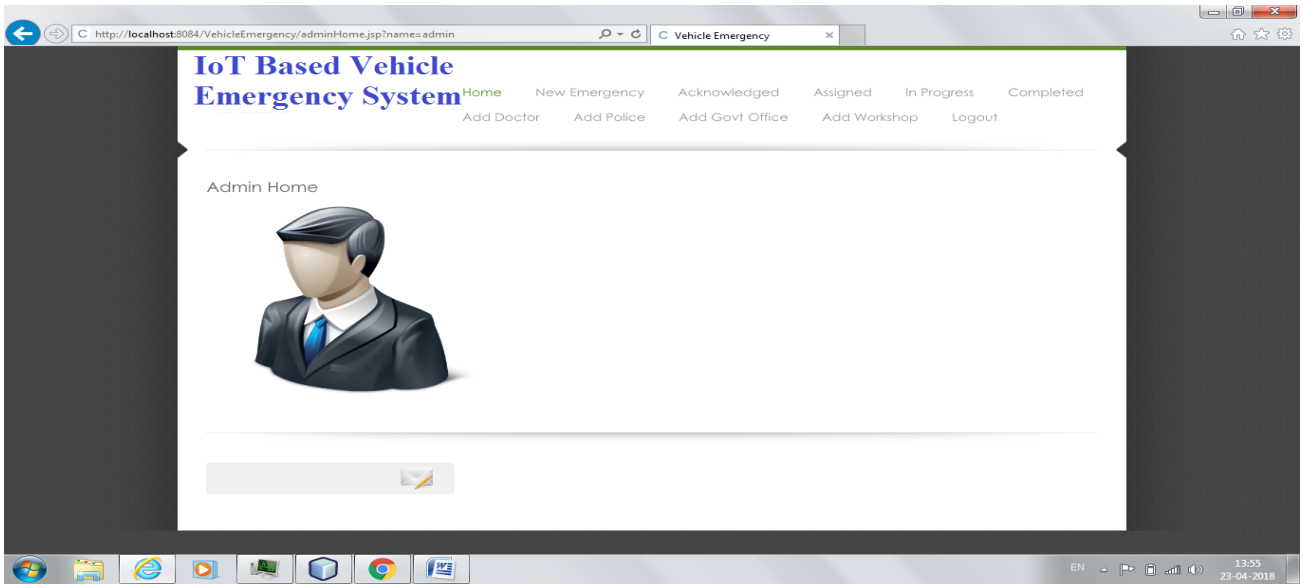
VII. RESULT

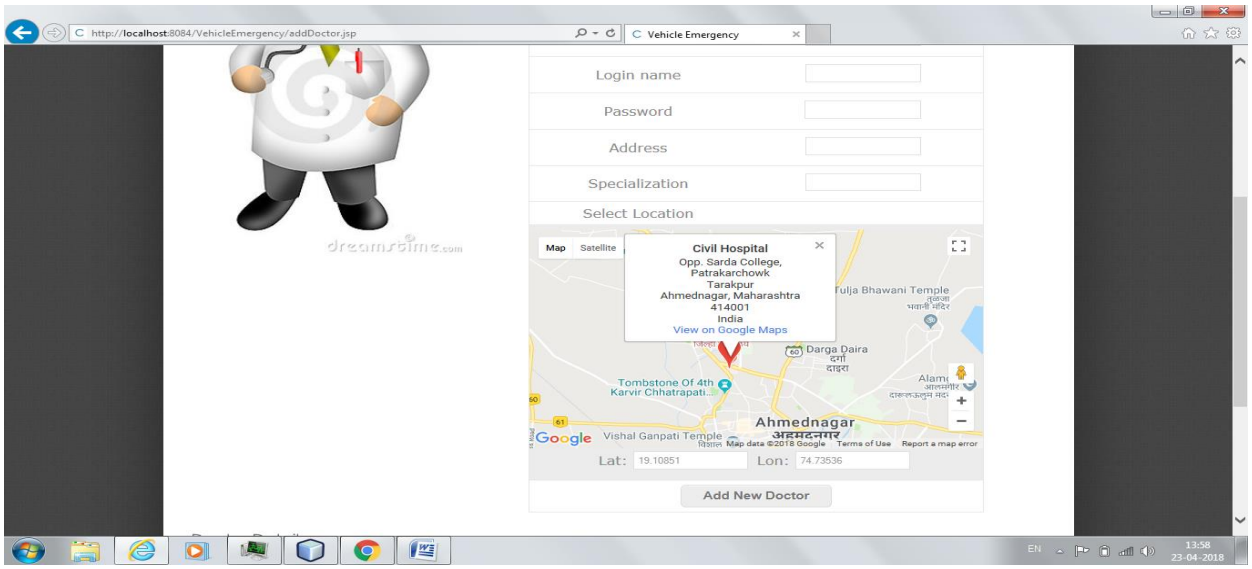
Following are the snapshots of complete flow of execution.

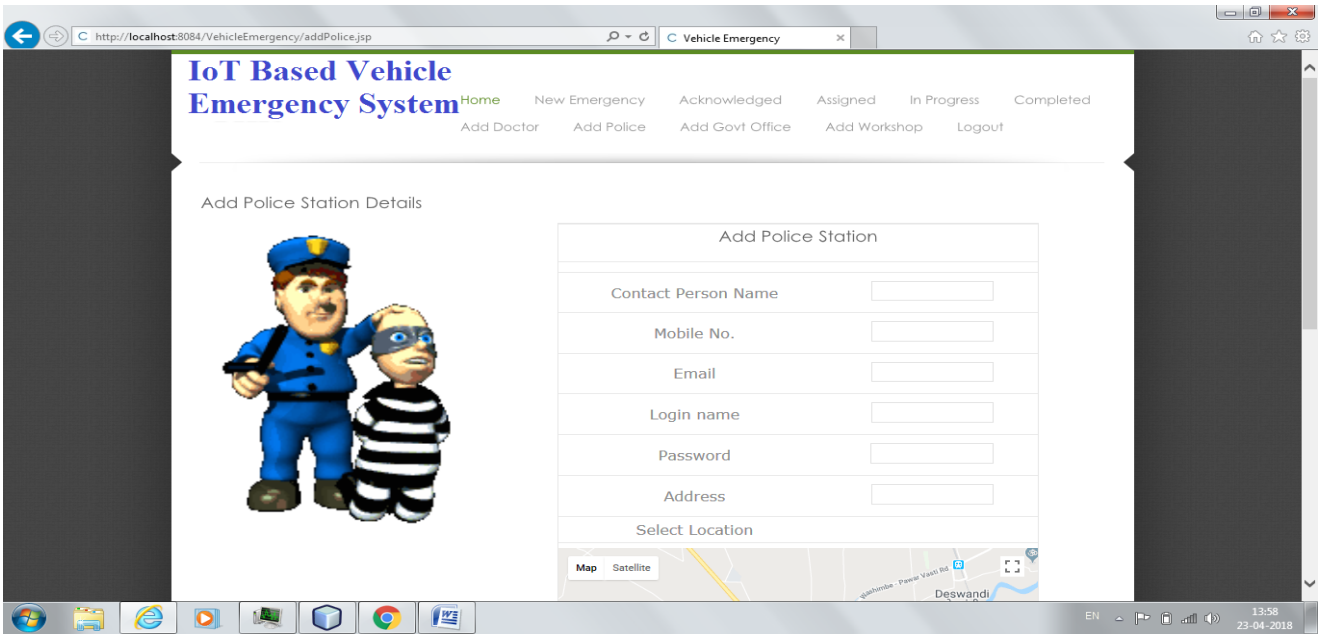


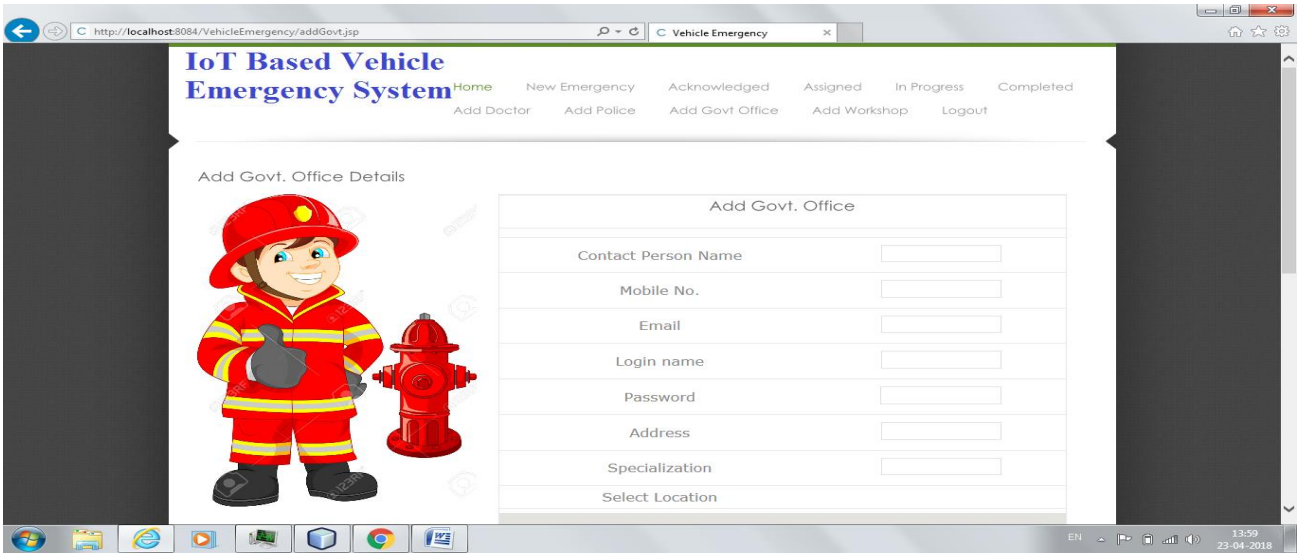








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Vehicle Emergency
IoT Based Vehicle Emergency System
Home
New Emergency
Acknowledged
Assigned
In Progress
Completed
Add Doctor
Add Police
Add Govt Office
Add Workshop
Logout
Add Govt. Office Details
Add Govt. Office
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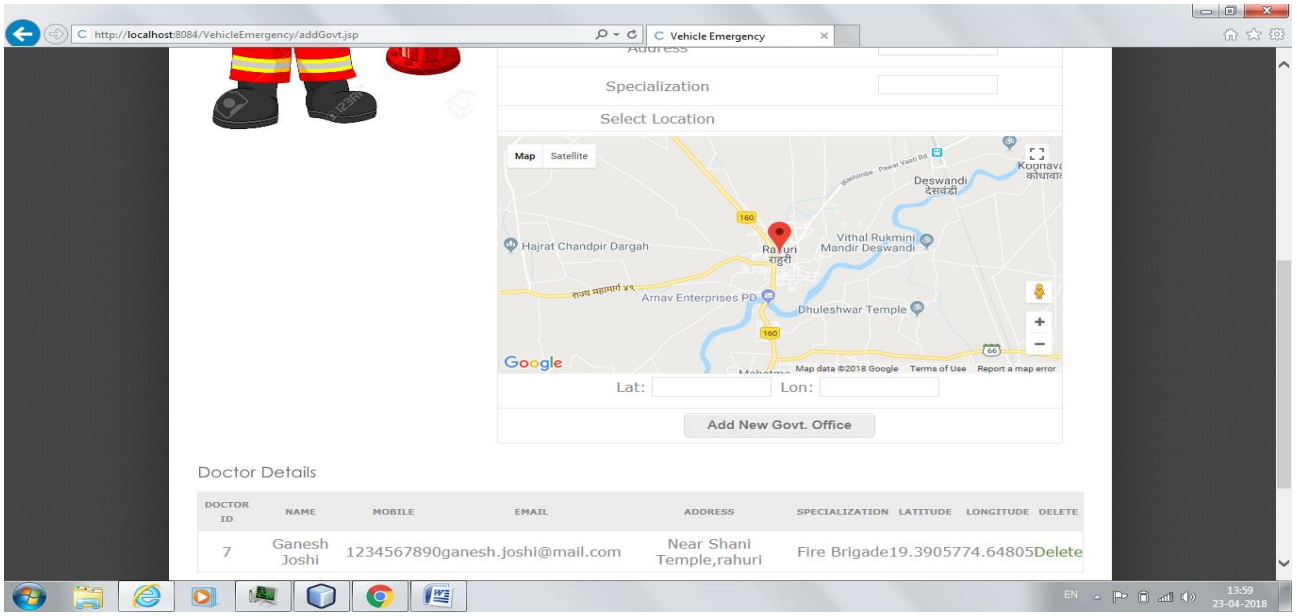
Email
Login name
Password
Address
Specialization
Select Location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Vehicle Emergency
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Map
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Deswandi
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Rahuri
राहुरी
Vithal Rukmini Mandir Deswandi
Arnav Enterprises PD
Dhuleshwar Temple
Google
Map data ©2018 Google
Terms of Use
Report a map error
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Doctor Details
DOCTOR ID
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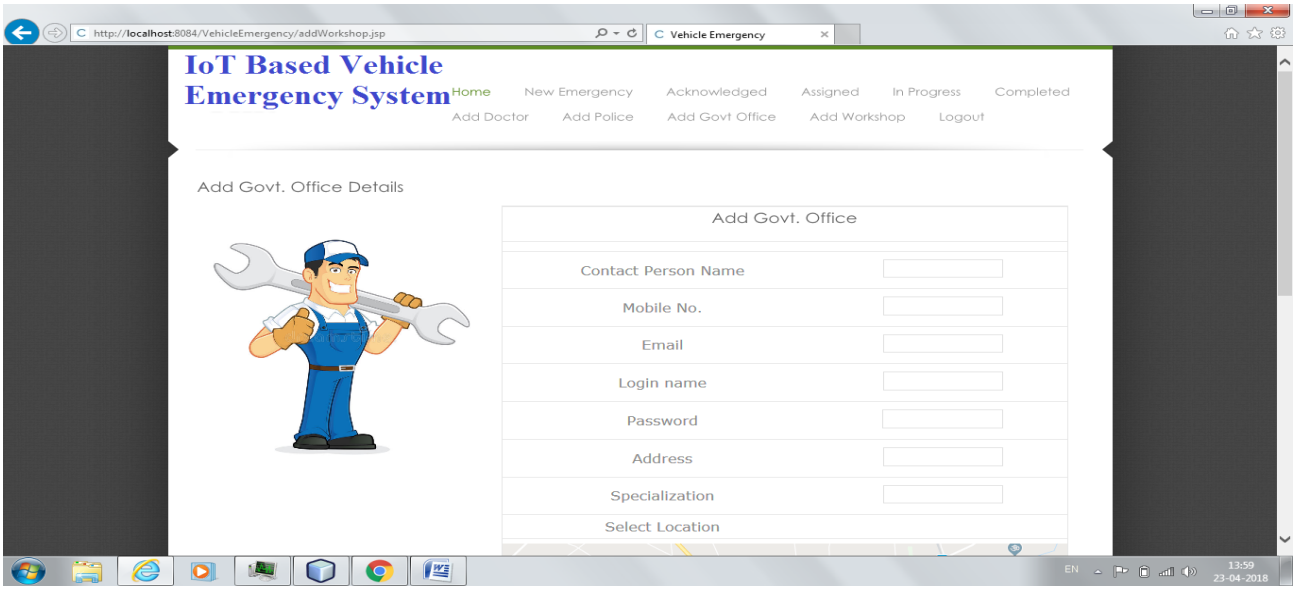
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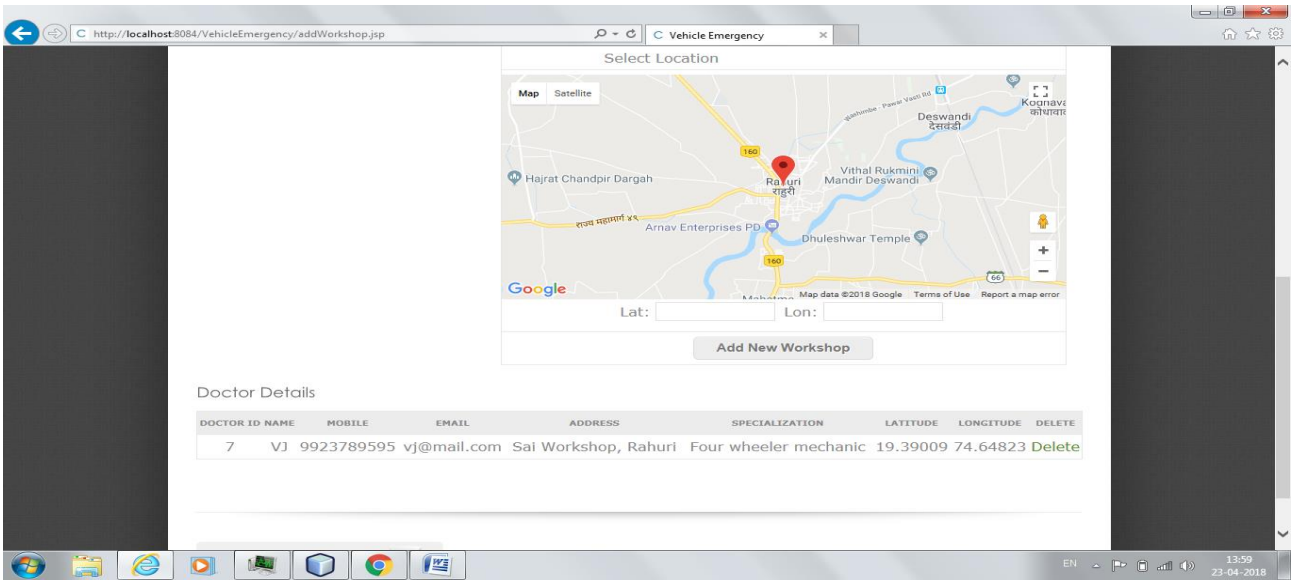
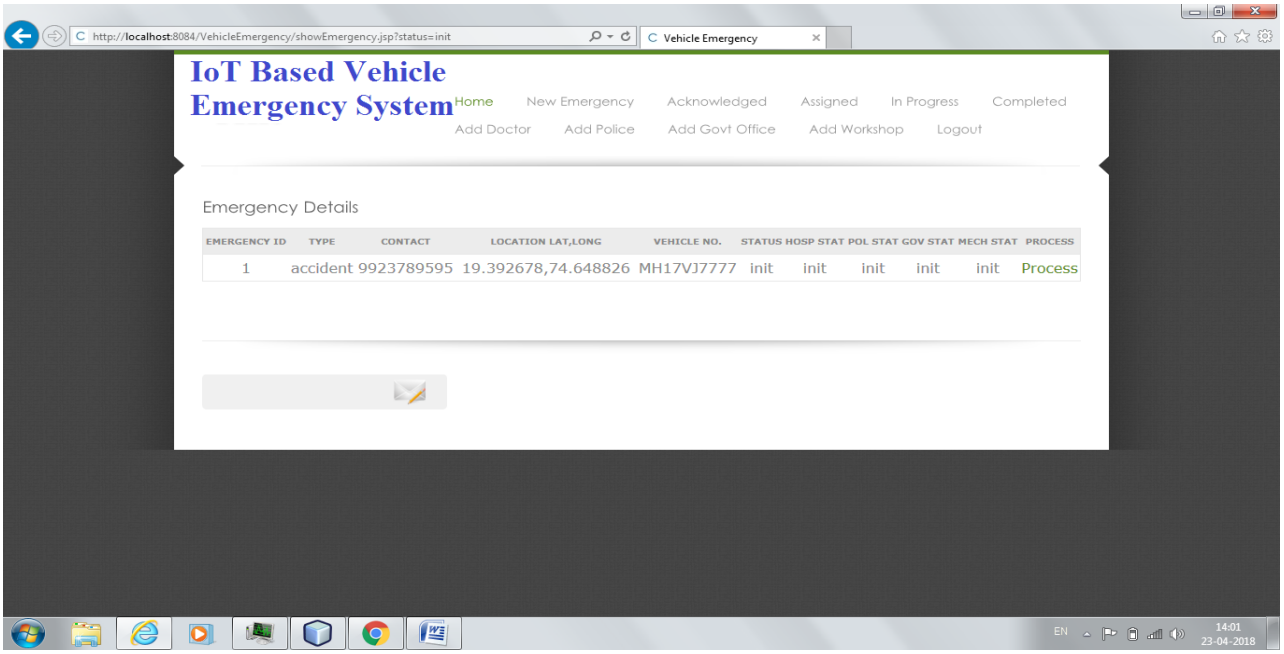
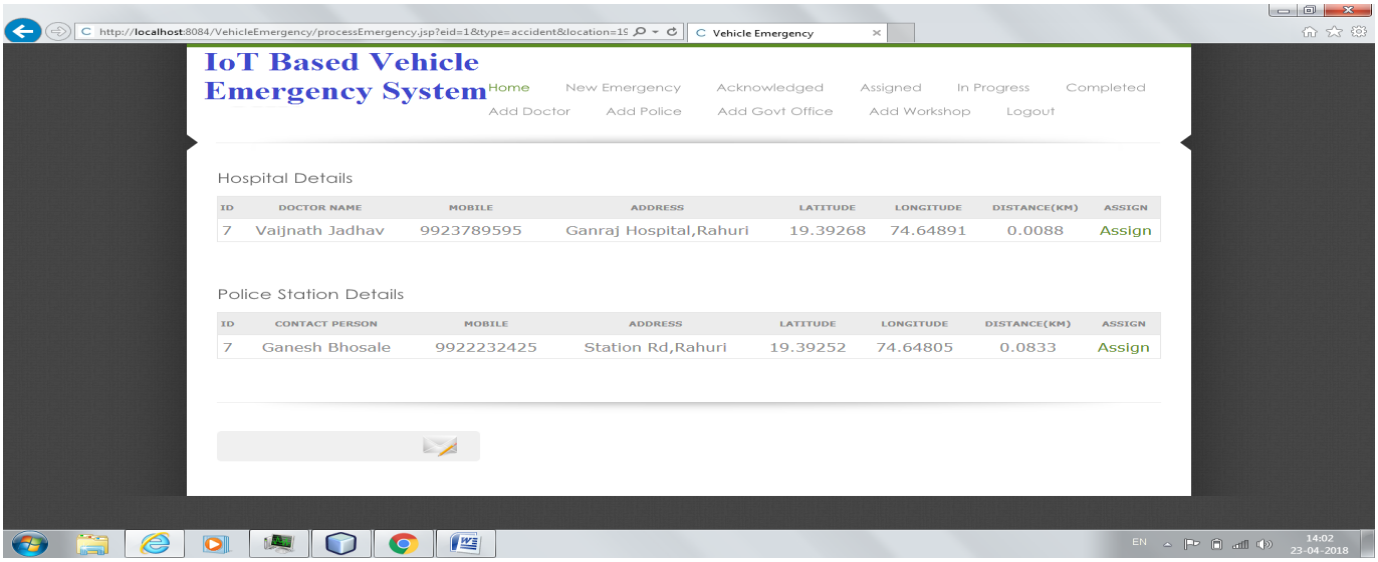
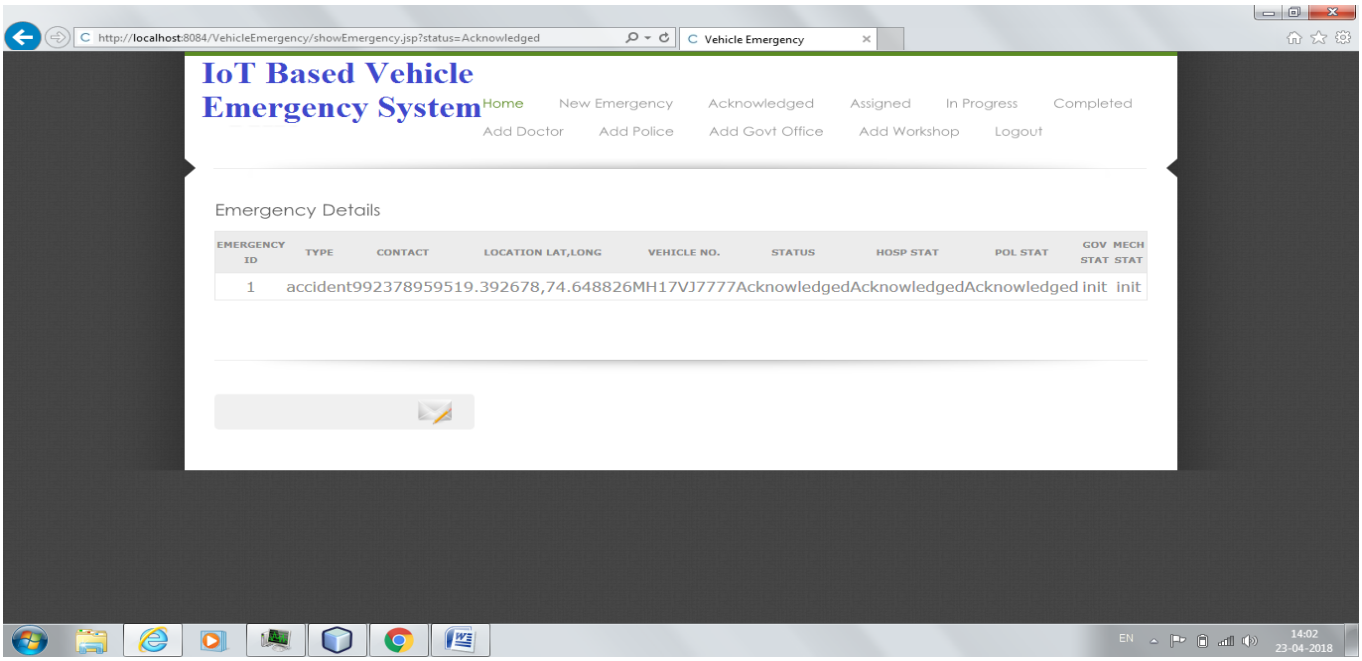
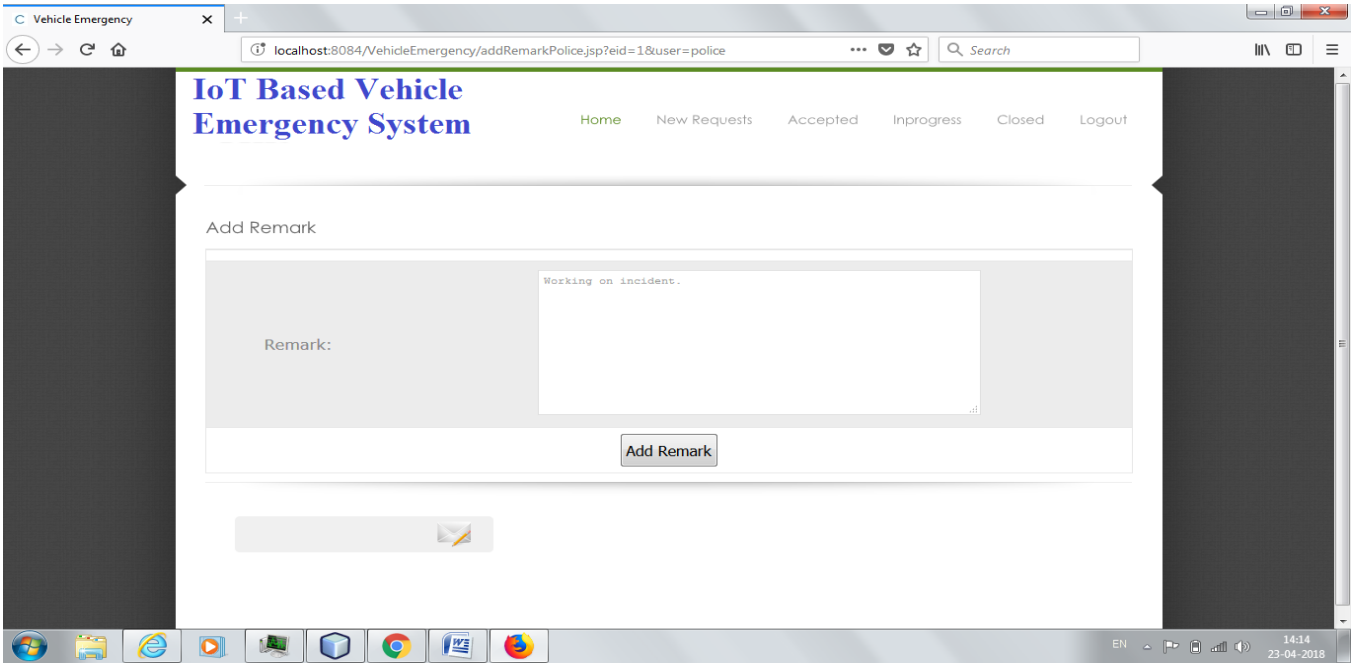
Vehicle Emergency
IoT Based Vehicle Emergency System
Home
New Emergency
Acknowledged
Assigned
In Progress
Completed
Add Doctor
Add Police
Add Govt Office
Add Workshop
Logout
Add Govt. Office Details
Add Govt. Office
Contact Person Name
Mobile No.
Email
Login name
Password
Address
Specialization
Select Location











REFERENCES

1. Subha Koley, Prasun Ghosal, "An IoT Enabled Real-Time Communication and Location tracking System for Vehicular Emergency",vol 1, 2017
2. M. Chen, "Towards Smart City: M2M Communications with Software Agent Intelligence," *Multimedia Tools and Applications*, vol. 67, no. 1, pp. 167–178, 2013.
3. NCRB, "Accidental Deaths and Suicides in India 2014," New Delhi: National Crime Records Bureau, Ministry of Home Affairs, Tech. Rep., 2015.
4. G. Van Brummelen, *Heavenly Mathematics: The Forgotten Art of Spherical Trigonometry*. Princeton University Press, 2013.
5. Cenedese, A. Zanella, L. Vangelista, and M. Zorzi, "Padova Smart City: An Urban Internet of Things Experimentation," in *World of Wireless, Mobile and Multimedia Networks (WoWMoM), 2014 IEEE 15th International Symposium on a*. IEEE, 2014, pp. 1–6.
6. J. Maleki, E. Foroutan, and M. Rajabi, "Intelligent Alarm System for Road Collision," *Journal of Earth Science and Engineering*, vol. 1, no. 3, 2011.

7. F. J. Martinez, C.-K. Toh, J.-C. Cano, C. T. Calafate, and P. Manzoni, "Emergency Services in Future Intelligent Transportation Systems Based on Vehicular Communication Networks," *Intelligent Transportation Systems Magazine, IEEE*, vol. 2, no. 2, pp. 6–20, 2010.
8. C. Thompson, J. White, B. Dougherty, A. Albright, and D. C. Schmidt, "Using Smartphones and Wireless Mobile Sensor Networks to Detect Car Accidents and Provide Situational Awareness to Emergency Responders," in *ICST Conf., June*, 2010.
9. R. A. Young, "Association Between Embedded Cellular Phone Calls and Vehicle Crashes Involving Airbag Deployment," in *1st International Driving Symposium on Human Factors in Driver Assessment, Training, and Vehicle Design, Aspen, CO*, 2001, pp. 390–400.
10. Y.-K. Ki and D.-Y. Lee, "A Traffic Accident Recording and Reporting Model at Intersections," *IEEE Transactions on Intelligent Transportation Systems*, vol. 8, no. 2, pp. 188–194, 2007.
11. M. Graham, S. A. Hale, and D. Gaffney, "Where in The World are You? Geolocation and Language Identification in Twitter," *The Professional Geographer*, vol. 66, no. 4, pp. 568–578, 2014.
12. W. Peng, F. Li, X. Zou, and J. Wu, ''A two-stage deanonymization attack against anonymized social networks,'' IEEE Trans. Comput., vol, 63, no. 2, pp. 290–303, 2014.

