ISSN: 2278 – 1323
International Journal of Advanced Research in Computer Engineering & Technology (IJARCET)
Volume 5, Issue 8, August 2016

IOT Based Unified Approach for Women and Children Security Using Wireless and GPS

Ms. Deepali M. Bhavale, Ms. Priyanka S. Bhawale, Ms. Tejal Sasane, Mr. Atul S. Bhawale

Abstract— **As the threats for Women and children increasing day by day we are proposing a system that works on the controversy of children and women security using IoT. The proposed system intends to a device wireless technique in the form of embedded device namely Arduino for women that will serve the purpose of alerts and way of communicating with secure channels and it captures the image using electronic camera. There are many android applications for women safety but they as not as much as efficient. So to solve this issue of women safety we develop a wireless sensor kit which is easy to use and which is efficient to provide help to that victim. so when the victim press kits button, our application will capture the photo, collect users information to send notification to registered phone numbers with link of captured image. This saves the time and that victim get help without loss of time. Also in the case of Children security the system proposes a speed monitoring and location tracking facilities using GPS, GPRS, GSM. The system consists of bus unit. The bus unit which is used to detect the path of Bus by using GPS.Weather the bus is travelling on its day to day route and also it monitors the overspeeding of bus. For the mechanism of vehicle tracking Haversine and Trilateration algorithm are used. According to that the by using GSM alert messages will be send to their parents and vehicle owner. The system has been developed on web based data driven application that provides the useful information.**

Keywords— Arduino, GPS/GSM/GPRS, Google Map, Sensors, Vehicle Tracking.

I. INTRODUCTION

Visual object tracking has been very important to a number of computer vision applications to name a few like surveillance system and gesture recognition robotics, and motion recognition. Progress in the online learning, imaging transformations, and object detection have lead to increase in the approach of tracking by detection. The object to be targeted is identified by the user in the first frame and then is described by a set of features it has. A set of feature describes their background. Another binary classifier then separates target from background in the successive frames. The changes in appearance has to be handled and the classifier could be updated incrementally over time span for it. Visual object recognition is also difficult for the computation. The Problem faced is of each object in the world casts a number of 2-D images on the retina. The lighting, object position and backgrounds change as per the position. Of viewer Object tracking means following of the trajectory of the object in the image frames sequence. For this object should be represented first. For representation of object appearance based methods could be used. After the representation of the object it is to be detected and then the object tracking can be done. Objects suspicious behaviour can be detected and tracked in surveillance system with the help of visual object tracking. In monitoring object tracking is used in traffic flow to track the vehicles and monitor the flow of the traffic for avoiding any jams. Video compression is also an applications of object tracking. Video object tracking can be applied in banks, residential areas, parking, malls for the monitoring activities. Object tracking can also be used for hand gesture recognition in the human-computer interaction applications. It is not easy to project 3D world into 2D image. Information may be lost in this process. Tracking purpose can be implemented using various methods. The effect of noise and the changing illumination conditions of the object of interest affects object tracking. Tracking of object can be difficult due to articulated object nature. A major problem faced in object tracking can be occlusion. Motion of object may be complex , there may be real time processing requirements for tracking. Thus proper method must be chosen according to where object tracking is used. In this paper we discuss different techniques used in object tracking.

A. Problem Statement

We are proposing a system which can be useful for women and children for security purpose. Proposed system for women consists of wearable safety device having an emergency button for sending notification and Camera for capturing attackers image. When women is in trouble she can press the button of the device immediately. Location of victim is tracked with help of GPS and image gets captured an emergency message with image link will be sent to all necessary contacts. For children, transportation security system is used which works on GPS,GPRS,GSM for vehicle tracking and monitoring mechanism. This system can make better use of Arduino based on Linux board. For this project algorithms used are of Haversine and Trilateration .

B. Goals and Objectives

The main goal of our project is to preserve the security of working women and school children, to serve our purpose we are developing Wireless portable women safety device and school bus tracking system. This embedded device have emergency press button for alert purpose, And electronic camera for capturing image of that instance. GSM system traces the current location of victim and send alert message to registered contact. The embedded camera capture image and it is send with alert message. Our system consists of children transportation security system for school bus. Overspeed monitoring is also done with the help of sensors. If the vehicles speed goes beyond the specified value of the speed, even then the warning message will be sent from system to the owner's mobile. This makes secure transportation for school children .

II. RELATED WORK

1. Orlando Arias, Jacob Wurm, Yier Jin, "Privacy and Security in Internet of Things and Wearable Devices" ,IEEE Transactions on Multi-Scale Computing Systems, VOL. 1,NO. 2, April-June 2015.

In this paper,The Internet of Things (IoT) , wearable devices, where embedded devices are loaded with sensors which collect information from surroundings. Then the information is processed and relayed to remote locations for analysis. Albeit looking harmless, these nascent technologies raise security and privacy concerns. They arise the question of the possibility and effects of compromising such devices. They discuss common design practices and their implications on security and privacy concentrating on the design flow of IoT and wearable devices. Two representatives from each category, the Google Nest Thermostat and the Nike+ Fuelband, cab be selected as examples on how current industry practices of security as an afterthought affect the resulting device and the potential consequences to the user's security. They then discuss design flow enhancements, through which security mechanisms can efficiently be added into device, vastly differing from traditional practices.

2. Seok Ju Lee, Girma Tewolde, Jaerock Kwon "Design and Implementation of Vehicle Tracking System Using GPS/GSM/GPRS Technology and Smartphone Application". IEEE World Forum on Internet of Things (WF-IoT), March 2014, Seoul

This paper represents an efficient vehicle tracking system designed and implemented for tracking the movement of any vehicle from any of the location at any time. The proposed system made use of popular technology that combines a Smartphone application with microcontroller. This will be easy to make and will be inexpensive compared to others. The designed in vehicle devices works using Global Positioning System (GPS) and the Global system for mobile communication/ General Packet Radio Service (GSM/GPRS) technology that is a way for vehicle tracking. The device is embedded inside a vehicle. The position of the vehicle is to be determined and tracked in the real-time. A microcontroller is used to control GPS and GSM/GPRS modules. The vehicle tracking system use the GPS module for getting geographic coordinates at the regular time intervals. The GSM/GPRS module is used to transmit and update the vehicle location to the database. A Smartphone application is developed for continuously monitoring the vehicle location. The Google Maps API can be used to display the vehicle on map in the Smartphone application. Thus, users will be able to continuously monitor moving vehicle on demand using Smartphone application and determine the estimated distance and time for the vehicle to arrive at given destination. In order to show feasibility and effectiveness of the system, this paper presents the experimental result of vehicle tracking system and experiences on practical implementations.

3. A. D. Thierer, "The internet of things and wearable technology: Addressing privacy and security concerns without derailing innovation" Rich. J. Law Technol., vol. 21, pp. 615, 2015.

This paper highlights some of the opportunities presented by the rise of the so-called Internet of Things and the wearable technology in particular, and encourages policy makers to allow these technologies to develop. The Internet of Things and wearable tech challenges existing social, economic, and legal norms. These technologies raise variety of privacy and safety concerns. Disputes arise over technical standards, system interoperability, and access to the adequate spectrum to facilitate wireless networking. Those issues are not dealt with here. Then alternative to top-down regulation is to deal with these concerns creatively as they develop using combination of educational efforts, technological empowerment tools, social norms, public and watchdog pressure, industry best practices and self-regulation, transparency, and targeted enforcement of existing legal standards (especially torts) as needed. This paper concludes by outlining these solutions.

4. Muruganandham, "Real Time Web based Vehicle Tracking using GPS", World Academy of Science, Engineering and Technology, 37, 2010.

Survey states that the Tracking systems were first developed for shipping industry because they wanted to determine where vehicles are at any given time period. Passive systems developed in the beginning were to fulfill these requirements. The applications which require real time

location information of the vehicle, these systems cannot be used as they save location information in the internal storage. This location information can be accessed only when the vehicle is available. To achieve the Automatic Vehicle Location that can transmit location information in real time, active systems are developed. The Real time vehicle tracking system includes a hardware device which is installed in the vehicle and a remote tracking server. The information is sent to Tracking server using GSM/GPRS modem by using SMS or using direct TCP/IP connection with Tracking server. Tracking server also has GSM/GPRS modem that can receive vehicle location information through GSM network. It then stores this information into the database. This information is available to the authorized users of the system over the internet.

5. R. Ramani, S. Valarmathy, N. Suthanthira Vanitha, S. Selvaraju, and M. Thiruppathi, Vehicle Tracking and Locking System Based on GSM and GPS, I.J. Intelligent Systems and Applications, 2013, 09, 86-93.

The survey of this paper states that almost all of the people having own vehicle, theft might happen on parking and sometimes driving in insecure places. The safety of vehicles is essential for public vehicles. Vehicle tracking and locking system is installed in the vehicle to track the place and lock the engine. The place of vehicle can be identified with the help of the Global Positioning system (GPS) and the Global system mobile communication (GSM). GSM & GPS systems constantly watch a moving Vehicle and reports the status on demand. When theft identified, the responsible person send SMS to the microcontroller, then the microcontroller will issue control signal to stop the engine. Authorized person need to send the password to the controller to restart the vehicle and then open the door. This will be more secured, reliable and low cost.

6. P. N. Mahalle, B. Anggorojati, N. R. Prasad, and R. Prasad, "Identify authentication and capability based access control (IACAC) for the internet of things," J. Cyber Security Mobility, vol. 1, pp. 309–348, 2013

A distributed, lightweight and attack resistant solution is the mandatory properties for the security solution in IoT. This paper presents an efficient and secure ECC based integrated authentication and access control protocol. This paper also presents a mutual authentication protocol and integrated with novel and secure approach of CAC for access control in IoT along with the implementation results. This paper presents comparative analysis of different authentication and access control schemes for IoT. Comparison in terms of the computational time shows that IACAC scheme is efficient as compared to other solution. The protocol is also analyzed for the performance and security point of view for different attacks in IoT scenario. Protocol evaluation shows that it can defy attacks like DoS, man-in-the-middle and replay attacks efficiently. The paper also presents protocol verification using AVISPA tool which proves that IACAC protocol is also efficient in terms of key sharing and authentication. Finally, they also presented a mathematical model for improving queuing analysis of IACAC

7. J. H. Ziegeldorf, O. G. Morchon, and K. Wehrle,"Privacy in the internet of things: Threats and challenges," Security Commun. Netw., vol. 7, no. 12, pp. 2728–2742, 2014.

This paper motivates the need for a detailed analysis of privacy threats and challenges in the Internet of Things. A four-step approach is used, First, we provide formal basis for discussing privacy in IoT by framing our notion of privacy and the applied reference model. The second step acknowledge that the Internet of Things is constantly evolving and it cannot be reduced to the sum of the technologies it builds upon. Thirdly, they summarized existing privacy threats into seven categories and review them according to the evolving IoT. Identification, tracking and profiling are known threats that will be greatly aggravated in the IoT. The four threats of privacy-violating interactions and presentations, lifecycle transitions, inventory attacks and information linkage arise later in the IoT evolution. The arrangement of threats in our reference model provides a clear idea of where threats appear and where to approach them conceptually. Finally, technical challenges are discussed in context of each threat that can provide clear directions for future research.

III. Mathematical Model

Set Theory Analysis:
S be the - Woman and Children safety Application as the final set
S =identify the inputs as D, Q, E
S = D, Q, E
D = D1 - D given user details
Q = Q1, Q2, Q3 .
Q-gives the bus number which is to be tracked
E= E1, E2, E3 .
E- gives the Button click events
Identify the outputs as O
S = N, C, R
N= N1, N2, N3, N4 - N given Notification
C = C1, C2, C3 . — C gives the Current location
R = R1, R2, R3 — R gives the user details
Identify the functions as F
S = F = F1(), F2(), F3(), F4(), F5(), F6()

F1 (D) :: Get User details
F2 (D) :: Registration
F3 (Q) :: fetch current location
F4 (Q) :: Send current location
F5 (D) :: Send user details
F6(E ,D) :: send notification

Hence the functionality can be shown as,

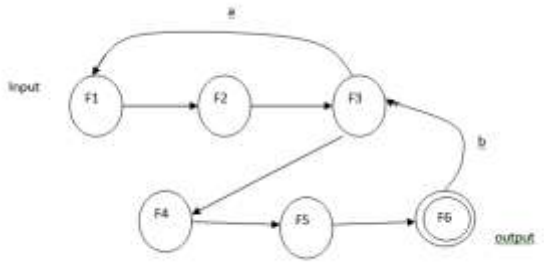

Fig. 2. Mathematical Model.

IV. CONCLUSION AND FUTURE SCOPE

In this paper we have proposed the system for security of women and children. This paper presented a wireless method which will alert and communicate with secure medium. It will also capture image via camera. When the sensor kit button is pressed the camera will captures the image and will collect the information of the user. This information will be sent to the registered phone number along with the image link. This system will . Speed monitoring for children security can also be done by using the GPS tracking mechanism. The bys Unit will locate the bus and all its travelling routes. This system uses Haversine and Trilateration algorithm for tracking the bus. Alert messeging will be done on the registered phone numbers.

REFERENCES

[1] Orlando Arias,Jacob Wurm,Yier Jin,"Privacy and Security in Internet of Things andWearable Devices" ,IEEE TRANSACTIONS ONMULTI-SCALE COMPUTING SYSTEMS,VOL. 1,NO. 2, APRIL-JUNE 2015

[2] SeokJu Lee, Girma Tewolde, Jaerock Kwon "Design and Implementation of Vehicle Tracking System Using GPS/GSM/GPRS Technology and Smartphone Application"IEEEWorld Forum on Internet of Things (WF-IoT), March 2014, Seoul

[3] A. D. Thierer, "The internet of things and wearable technology: Addressing privacy and security concerns without derailing innovation"Rich. J. Law Technol., vol. 21, pp. 615, 2015.

[4] Muruganandham, "Real TimeWeb based Vehicle Tracking using GPS",World Academy of Science, Engineering and Techonogy, 37, 2010

[5] R.Ramani, S.Valarmathy, N.SuthanthiraVanitha, S.Selvaraju, and M.Thiruppathi, Vehicle Tracking and Locking Sytem Based on GSM and GPS, I.J. Intelligent Systems and Applications, 2013, 09, 86-93

[6] P. N. Mahalle, B. Anggorojati, N. R. Prasad, and R. Prasad, "Identify authentication and capability based access control (IACAC) for the internet of things," J. Cyber Security Mobility, vol. 1, pp. 309–348, 2013

[7] J. H. Ziegeldorf, O. G. Morchon, and K. Wehrle,"Privacy in the internet of things: Threats and challenges," Security Commun. Netw., vol. 7, no. 12, pp. 2728–2742, 2014

[8] A. D. Thierer, "The internet of things and wearable technology: Addressing privacy and security concerns without derailing innovation," Rich. J. Law Technol., vol. 21, pp. 6–15, 2015.

[9] Z. Shelby, K. Hartke, C. Bormann, and B. Frank, "Constrained application protocol (CoAP), draft-ietf-core-coap-13," in The Internet Engineering Task Force (IETF), 2012.

[10] M. Brachmann, S. L. Keoh, O. Morchon, and S. Kumar, "End-toend transport security in the ip-based internet of things," in Proc. 21st Int. Conf. Comput. Commun. Netw., 2012, pp. 1–5.

[11] R. Seggelmann, "Sctp: Strategies to secure end-to-end communication," Ph.D. dissertation, Univ. Duisburg-Essen, Essen, Germany, 2012.

[12] F. McKeen, I. Alexandrovich, A. Berenzon, C. Rozas, H. Shafi, V. Shanbhogue, and U. Savagaonkar, "Innovative instruction and software model for isolated execution," in Proc. 2nd Int. Workshop Hardware Architectural Support Security Privacy, 2013.

[13] I. Anati, S. Gueron, S. P. Johnson, and V. R. Scarlata, "Innovative technology for cpu based attestation and sealing," in Proc. 2nd Int.Workshop Hardware Architectural Support Security Privacy, 2013.

Ms. Deepali M. Bhavale persuing B.Tech.in Electronics and Telecommunication, VJTI, Mumbai

Ms. Priyanka S. Bhawale Asst.Prof.at Dr.NJPIT, Ahmednagar.She has completed M.E. in Computer Engineering in 2015**,** B.E. in Information Technology in 2010.Her area of interest includes Image processing,,Data Mining and IOT.

Ms. Tejal Sasane persuing B.E. in Computer Engineering from JSPM's JSCOE, Pune.

Mr. Atul S. Bhawale completed M.Sc. in Computer Science in 2014 from MIT, Pune.

