

# SURVEY ON TECHNO LEVEL OBSTACLE SENSING USING ULTRASONIC BASED SERVICES

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**Abstract-** Along with a fast growing economy of a developing country as far as India is concerned, there has been reported a emerging number of harassment and criminal offences against disabled women. In many of the cases the suspects are quite freely escaped due lack of communication links in time. Our goal is to design a intelligent device which can alert the authorities when any harassment is happening. Our system requires minimum power consumption and least human efforts. Initially it sends a signal to the nearest traffic control or police station intimating the state of crime along with its location. The processor chosen to be is the Arduino UNO, and the communication to the police control is done using GPS and GSM technology.

**Keywords-** GPS (Global Positioning System), GSM (Global System for Mobile communication), Arduino UNO.

## 1 INTRODUCTION

SENSOR-based human-activity monitoring and recognition systems may use data from environmental sensors, or wearable motion sensors. The work reported here has been applied to data from wearable motion sensors.

The major steps for monitoring and recognition of human activities are: (i) data collection, (ii) data preprocessing, (iii) feature extraction, and (iv) identification of activities. The first three steps are for generating training or testing patterns. During the training phase, the system gathers the required knowledge from training patterns. During monitoring and recognition phase, the pattern generated from input dataset, applying aforementioned three steps, is utilized.

Wearable sensor data preprocessing includes one or some combination of the following steps: (i) filtering, (ii) normalization, (iii) adjustment for missing data, etc.. Noise and artifacts from the sensor data are removed using lowpass, high-pass, and band-pass filters, while normalization compensates for fluctuation of signal strengths among different by radius around the predicted location (cell) that the user might be in, and confidence as the level of assurance that the user will be in the predicted area. We applied the proposed radius prediction methods on the output of three representative location prediction algorithms (frequent cells, Markov chain model and matrix factorization) using three different datasets, and compared the methods with the previously proposed fixed radius approach. Our results demonstrate the ability to dynamically determine a confidence radius that increases prediction accuracy while maintaining a small average radius.

“Reduction in consumers’ purchasing cost by online shopping”, Kosuke Miyatake a, Toshinori Nemoto a, Satoshi Nakaharai a, Katsuhiko Hayashi b. They have suggested how the online shopping affects retailer’s selling cost and consumer’s purchasing cost compared with the case of shopping at brick-and-mortar stores. Furthermore, we examine how delivery manners affects retailer’s and consumer’s cost, concluding that the online shopping retailers should clearly introduce the delivery charge independent from the price of the items.

## 2 LITERATURE SURVEY

Location-Based Services (LBS) are able to assist the way people interact with the world. LBS is used almost exclusively for navigation, but there are many aspects of navigation which can be assisted with the use of this technology. Seeing that Location-Based Services are tied to the location of a user, navigation is perhaps the core use for LBS.

### Forms of Navigation

#### Indoor Navigation:

The idea of navigating through indoor spaces with mobile devices is not a new one, but constant advancements in both the technological capabilities and availability of these mobile devices has meant the ability to easily set up systems to navigate indoors is much easier. In later sections we will cover how indoor navigation is accomplished.

#### Outdoor Navigation:

Navigation with the use of maps has existed for thousands of years, but with mobile devices users are now able to find their way through technological means such as GPS. Location Based Services are able to build upon this foundation to provide more extensive assistance in the area of outdoor navigation.

J. Yang et.al [1] introduced, “Activity recognition based on RFID object usage for smart mobile devices,” in *Journal of Computer Science and Technology in 2011*, which involved a RFID sensor to support workrate of a person used in places like marts. Uses Reverse Makrov algorithm. Its main issue is in the detection process because of the range.

F. Attal et.al [2] introduced “Physical human activity recognition using wearable sensors,” *Sensors*, vol. 15, no. 12, pp. 31314–31338, 2015, where motion of the players are recognized through sensors. Used in Simulations only. Can work in a room with required technology.

M. Janidarmian et.al [3] introduced, “A comprehensive analysis on wearable acceleration sensors in human activity recognition,” *Sensors*, 2017 where human movement can be detected through sensors like RFID for human security purposes. Range is a main issue

M. Cornacchia et.al[4]introduces, “A survey on activity detection and classification using wearable sensors,” *IEEE Sensors Journal*, , 2017.where a statistical research on human mactions are monitored through different types of sensors with different success rates.

S. Mukhopadhyay[5] introduced, “Wearable sensors for human activity monitoring: A review,” *IEEE Sensors Journal*, , no. 3, pp. 1321–1330, March 2016 where sensors are positioned on human skin to make it unnoticeable by humanns.Used for military applications.Problem is it wears out and affects health of user.

O. D. Lara et.al [6]introduced, “Centinela: A human activity recognition system based on acceleration and vital sign data,” *Pervasive and Mobile Computing*, , 2016 where vital organs of humans like heart rate etc are monitored using sensors.Only possible for certain organs.Uses Reverse Makrov algorithm.

N. Capela et.al [7]introduced , “Evaluation of a smartphone human activity recognition application with able-bodied and stroke participants,” *Journal of neuroengineering and rehabilitation*, 2016 where sensors are inserted into the smartphone and connected to a process to support human movement.Also it uses revers Makrov algorithm.Works onlybto a certain range.

O. D. Lara et.al [8]introduces, “A survey on human activity recognition using wearable sensors,” *IEEE Communications Surveys & Tutorials*, 2016 where a survey is taken on Sensors for monitoring human activities.Uses different algorithms and sensors.

A. Y. Yang et.al [9], “Distributed recognition of human actions using wearable motion sensor networks,” *Journal of Ambient Intelligence and Smart Environments*, vol. 1, no. 2, pp. 103– 115, 2017 ,where ultrasonic waves are used to detect locations in real time and provide qualitative analysis.Fails to support other sensors.

Table 1. Survey on location based services techniques

| S.NO | AUTHOR  | TITLE  | TECHNOLOGY USED   | RESULT  | ISSUES  |
|------|---|--|---|---|---|
| 1    | J. Yang, J. Lee, and J. Choi  | Activity recognition based on RFID object usage for smart mobile devices                                   | RFID,Wi-Fi,and ultrasonic sensors used.                             | Provides monitoring information on products and type of customer in marts.                            | Range is a major problem. Works for RFID and not for other sensors          |
| 2    | F. Attal, S. Mohammed, M. Dedabrishvili, F. Chamroukhi, L. Oukhellou, and Y. Amirat | J Physical human activity recognition using wearable sensors   | Ultrasonic Sensors ,GSM ,GPS ,Wi-Fi,Reverse Makrov Algorithm        | Provides the type of action based on the movement of joints connected to the sensor.                  | Data Sparsity is a major issue.   |
| 3    | M. Janidarmi-an, A. Roshan Fekr, K. Radecka, and Z. Zilic                           | A comprehensive analysis on wearable acceleration sensors in human activity recognition                    | K-means algorithm,Accelerometer,EMD method                          | Provided the position and prediction of human positions based on EMD method.Provided 62% success rate | The locationactivity matrix extracted from GPS trajectories is sparse.      |
| 4    | M. Cornacchia, K. Ozcan, Y. Zheng, and S. Velipasala[                               | A survey on activity detection and classification using wearable sensors                                   | Eddy current sensor,GSM,andLocation Monitoring Algorithms.          | Provided working of the sensors and provided different range variances                                | finding the optimal type of sensor varies for various task.                 |
| 5    | S. Mukhopadhyay   | Wearable sensors for human activity monitoring   | precise algorithm, Location based Algorithm.                        | proved that Location Still Matters for areas like hospitals.  | Sensor product would wear down and needs to be replaced eich costs a lot.   |
| 6    | O. D. Lara, A. J. Perez, M. A. Labrador, and J. D. Posada                           | Centinela: A human activity recognition system based on acceleration and vital sign data                   | Geographical Information Systems (GIS) Techniques,Ultrasonic Sensor | Monitors human helath condition whenever possible and offers emergency information.                   | issues arise when false alarm occurs.                                       |
| 7    | N. Capela, E. Lemaire, N. Baddour, M. Rudolf, N. Goljar, and H. Burger              | Evaluation of a smartphone human activity recognition application with able-bodied and stroke participants | Using RFID Sensor,GSM,GPS,Reverse Makrov                            | determined the relationships among different activities for various monitoring human actions.         | Draining of power and accuracy of results.                                  |
| 8    | O. D. Lara and M. A. Labrador   | A survey on human activity recognition using wearable sensors  | Electric transducer,GPS,GSM.  | Providing range of different transducers in tracking position of people.76% efficient                 | affect the prediction accuracy (e.g., the location sensors' natural error). |
| 9    | <b>A. Y. Yang, R. Jafari, S. S. Sastry, and R. Bajcsy</b>                           | Distributed recognition of human actions using wearable motion sensor networks                             | Precise algorithm   | Provides situation of people in different areas based on location tracking mechanism.                 | Providing Real time support is difficult.                                   |

**CONCLUSION AND FUTURE WORK**

Automatic identification of daily life activities can be used for promotion of healthier physical activities and lifestyle. There are many inexpensive wireless motion sensing devices or one can be assembled using off-the-shelf hardware components. These sensors can be used to make small wearable devices and collect motion data for monitoring regular human activities.

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