

## HUMAN ACTIVITY RECOGNITION USING SMART PHONE

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**Abstract (10):** Activity recognition is one of the most important technology behind many applications such as medical research, human survey system and it is an active research topic in health care and smart homes. Smart phones are equipped with various built-in sensing platforms like accelerometer, gyroscope, GPS, compass sensor and barometer. We can design a system to capture the state of the user. Activity recognition system takes the raw sensor reading from mobile sensors as inputs and estimates a human motion activities and users usually carry their smartphone with them. These facts make HUMAN ACTIVITY RECOGNITION more important and popular. This work focuses on recognition of human activity using smartphone sensors using deep learning approaches like Recurrent Neural Network (RNN). This paper presents a human activity recognition (HAR) system that uses accelerometer and gyroscope data obtained from a smartphone as inputs to a bidirectional long short-term memory (LSTM) model of the RNN model network. Six human activities were recognized: sitting, standing, laying, walking, walking upstairs, and walking downstairs. Results of the approaches used are compared in terms of efficiency and precision

**Keywords:** Smart phones, Accelerometer, Gyroscope, Activity Recognition, Long short term memory, deep learning

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## 1. INTRODUCTION

The demands for understanding human activities have grown in health-care domain, especially in elder care support, rehabilitation assistance, diabetes, and cognitive disorders. A huge amount of resources can be saved, if sensors can help caretakers record and monitor the patients all the time and report automatically when any abnormal behavior is detected.

Other applications such as human survey system and location indicator are all benefited from the study. Many studies have successfully identified activities using wearable sensors with very low error rate, but the majority of the previous works are done in the laboratories with very constrained settings. This uses low-cost and commercially available smart phones as sensors to identify human activities. According to the statistic of US mobile subscribers, around 44% of mobile subscribers own smartphones and 96% of these smartphones have built-in inertial sensors such as accelerometer or gyroscope. Research has shown that gyroscope can help activity recognition even though its contribution alone is not as good as accelerometer. Because gyroscope is not so easily accessed in cell phones as accelerometer, our system only uses readings from a 3-dimensional accelerometer.

In our design, the phone can be placed at any position around waist such as left pocket, right pocket, upper arm, belt with arbitrary orientation. These are the most common positions where people carry mobile phones.

## 2. DESIGN

The Human activity recognition using smart phone APP consist of the following modules. Modules used in this system are:

Initially the person want to install the app in the mobile, At the point of app installed it starts taking the data from the default sensors of smart phone like Accelerometer, Gyroscope, Linear Accelerometer by these sensors the app predict the activity of person at the particular time.

Accelerometer : It calculates the human acceleration in the format of 3Aaxis (X,Y,Z),it calculates the acceleration of person by force applying on the smart phone.

Gyroscope: It gives the additional data to the accelerometer by calculating phone rotation rate by detecting the roll pitch and yaw motion of smart phones along (X,Y,Z) axis

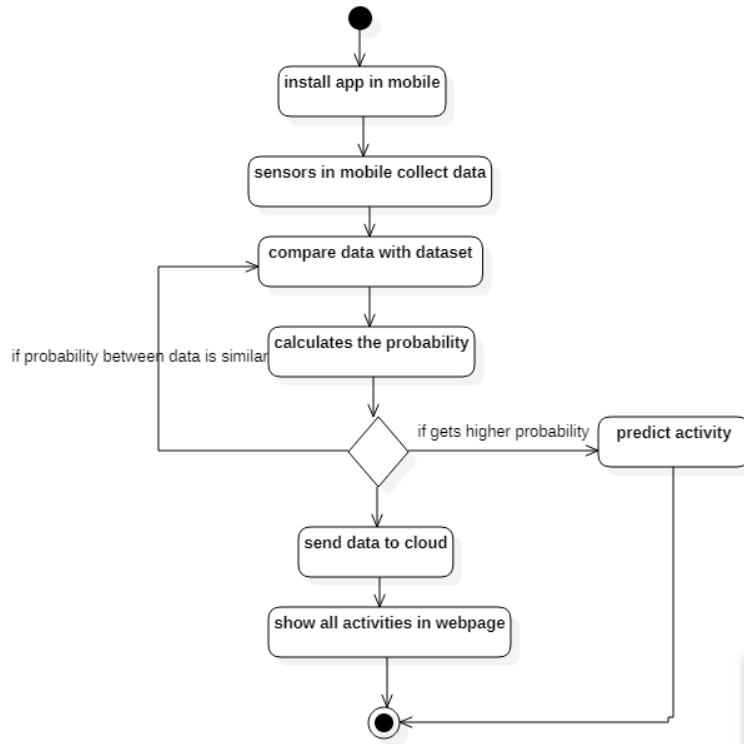
Recognizing Activities.: The Human activity recognition will predict the activity of the user by using default sensors in the mobile like accelerometer and gyroscope, The sensors gets the data in the format of (X,Y,Z) .

App Highlights the activity recognition with probability, It recognizes and highlights the activities like Downstairs,Upstairs,Jogging,Sitting,Standing,Walking,Biking .

Cloud: By using the key generated in the cloud uses to make monitor all the activities of particular human to store data and show all activities in the webpage to user and his/her caretaker

Webpage: we predict total activities in a single web page done by a person in a day with the time duration and our android application can also work in the background.

### 3. Figure



### 4. ANALYSIS

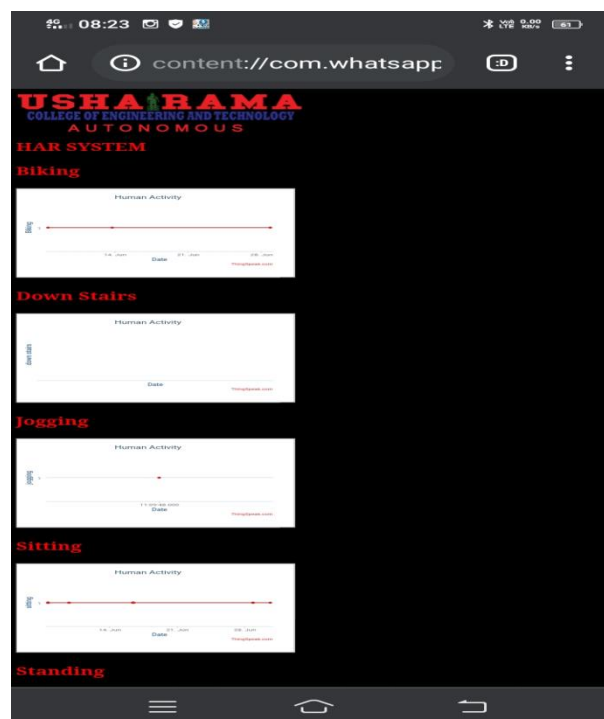
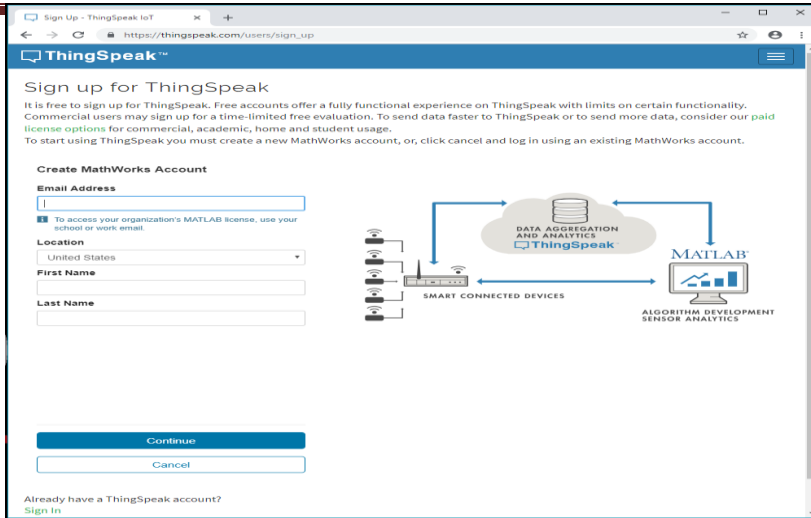
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### 5. RESULTS

The HUMAN ACTIVITY RECOGNITION ANDROID APP will gets all the activities performing by the user with using the sensors in the mobile it highlights the activities with probability in the app by using deep neural network, from model the data goes to the thigspeak(cloud) by using user credentials by using that cloud all the activities of the user can be seen in the webpage, the webpage of the user can monitor by the caretaker.



Activity	Probability
Downstairs	0.0
Jogging	0.01
Sitting	0.21
<b>Standing</b>	<b>0.77</b>
Upstairs	0.0
Walking	0.0
Biking	0.0



## 6. CONCLUSIONS

In conclusion, human activity recognition is challenging one. With the advancement of the Internet of Things (IoT), the blend of both technologies could impact our lives on a daily basis. Smart phones sensors are amazing application that can very well allow us to live our lives more productively, more safely, and more informatively. This paper has presented an initial effort at analyzing activities of human by using sensors like accelerometer and gyroscope. These sensors are inbuilt sensors of our smart phones so, the equipment are highly accessible experiment found on mobile phones. this paper can be seen as simply a starting point at predicting all activities of a person ..

## REFERENCES

- [1] Xing Su, Hanghang Tong, and Ping Ji , —Activity Recognition with Smartphone Sensors| , science and technology ISSN 111007- 0214|102/11|pp235-249 Volume 19, Number 3, June 2014.
- [2] Nicholas D.Lane , Emiliano Miluzzo, Hong Lu, Daniel A Survey of Mobile Phone Sensing |, IEEE Communications Magazine September 2010
- [3] Sahak Kaghyan, Hakob Sarukhanyan, |Activity recognition using k nearest neighbor algorithm on smart phone with tri-axial accelerometer |,International Journal "Information Models and Analyses" Vol.1 / 2012J.
- [4] Mustafa Kose, Ozlem Durmaz Incel,Cem Ersoy |Online Human Activity Recognition on Smart Phones|2nd International Workshop on Mobile Sensing, April 16, 2012.