

## **DECLARATION**

I **Sneha J** hereby declare that the Project Report entitled **Human activity recognition with smartphones Using Machine Learning Process** done by me under the guidance of **Dr. R.M.Gomathi, M.Tech., Ph.D.,** and **Dr.L.LAKSHMANAN M.E., Ph.D.,** and **Dr.S.VIGNESHWARI M.E.,Ph.D.,** at **Sathyabama Institute of Science and Technology** is submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering degree in Computer Science and Engineering.

**DATE:**

**PLACE:**

**SIGNATURE OF THE CANDIDATE:**

## ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to **Board of Management of SATHYABAMA** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

I convey my thanks to **Dr. T.Sasikala M.E., Ph.D., Dean, School of Computing , and Dr.L.Lakshmanan M.E., Ph.D., Dr.S.Vigneshwari M.E., Ph.D.,** Heads of the Department of Computer Science and Engineering for providing me necessary support and details at the right time during the progressive reviews.

I would like to express my sincere and deep sense of gratitude to my Project Guide **Dr.R.M.Gomathi M.Tech., Ph.D.,** for his valuable guidance, suggestions and constant encouragement paved way for the successful completion of my project work.

I wish to express my thanks to all Teaching and Non-teaching staff members of the **Department of Computer Science and Engineering** who were helpful in many ways for the completion of the project.

## Human activity recognition with smartphones using machine learning process

### TABLE OF CONTENT

SL.NO	TITLE	PAGE.NO
01	<b>ABSTRACT</b>	
02	<b>EXISTING SYSTEM</b> 2.1 DRAWBACKS	
03	<b>INTRODUCTION</b> 3.1 DATA SCIENCE 3.2 ARTIFICIAL INTELLIGENCE	
04	<b>MACHINE LEARNING</b>	
05	<b>PREPARING DATASET</b>	
06	<b>PROPOSED SYSTEM</b> 6.1 ADVANTAGES	
07	<b>LITERATURE SURVEY</b>	
08	<b>SYSTEM STUDY</b> 8.1 OBJECTIVES 8.2 PROJECT GOAL 8.3 SCOPE OF THE PROJECT	
09	<b>FEASIBILITY STUDY</b>	
10	<b>LIST OF MODULES</b>	
11	<b>PROJECT REQUIREMENTS</b> 11.1 FUNCTIONAL REQUIREMENTS 11.2 NON-FUNCTIONAL REQUIREMENTS	
12	<b>ENVIRONMENT REQUIREMENT</b>	
13	<b>SYSTEM ARCHITECTURE</b>	
14	<b>WORKFLOW DIAGRAM</b>	
15	<b>MODULE DESCRIPTION</b> 15.1 MODULE DIAGRAM 15.2 MODULE GIVEN INPUT EXPECTED OUTPUT	
16	<b>DEPLOYMENT</b>	
17	<b>CODING</b>	
18	<b>CONCLUSION</b>	
19	<b>FUTURE WORK</b>	

## LIST OF FIGURES

SL.NO	TITLE	PAGE.NO
01	SYSTEM ARCHITECTURE	
02	WORKFLOW DIAGRAM	
03	MODULE DIAGRAM	

### **1. Abstract:**

Human activity recognition requires to predict the action of a person based on sensor-generated data. It has attracted major interest in the past few years, thanks to the large number of applications enabled by modern ubiquitous computing devices. It classify data into activity like Walking, walking upstairs, walking down stairs, sitting,

standing, laying are recognized. Sensor data generated using its accelerometer and gyroscope, the sensor signals (accelerometer and ore.

## **2.EXISTING SYSTEM**

This paper proposes and develops a cascaded deep neural network (CDNN) to analyze data, collected using the sensors of smart-phones, to accurately localize an object in an indoor environment. There are many existing studies that have attempted to identify the location of an inhabitant in a room through the analysis of the radio signal strength (RSS), with varying success. places. The proposed CDNN suffers from space and computational complexities, especially for training each of the DNNs in the CDNN. We also plan to improve the CDNN structure such that the number of DNNs can be reduced without affecting the localization accuracy.

### **2.1 Drawbacks**

- The CDNN achieves only 80.41% and 74.14% localization accuracies for the training and testing data.
- Evidently proves the difficulty of localizing the exact position of the object within a very short distance/radius (say a 1 to 1.5 m radius).

## **3.INTRODUCTION**

### **Domain overview**

#### **3.1 Data Science**

Data science is an interdisciplinary field that uses scientific methods, processes, algorithms and systems to extract knowledge and insights from structured and unstructured data, and apply knowledge and actionable insights from data across a broad range of application domains.

The term "data science" has been traced back to 1974, when **Peter Naur** proposed it as an alternative name for computer science. In 1996, the International Federation of Classification Societies became the first conference to specifically feature data science as a topic. However, the definition was still in flux.

#### **Required Skills for a Data Scientist:**

- **Programming:** Python, SQL, Scala, Java, R, MATLAB.
- **Machine Learning:** Natural Language Processing, Classification, Clustering, ...
- **Data Visualization:** Tableau, SAS, D3.js, Python, Java, R libraries.
- **Big data platforms:** MongoDB, Oracle, Microsoft Azure, Cloudera.
- 

### 3.2 ARTIFICIAL INTELLIGENCE

Artificial intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions. The term may also be applied to any machine that exhibits traits associated with a human mind such as learning and problem-solving.

### 4.MACHINE LEARNING

Machine learning is to predict the future from past data. Machine learning (ML) is a type of artificial intelligence (AI) that provides computers with the ability to learn without being explicitly programmed. Machine learning focuses on the development of Computer Programs that can change when exposed to new data and the basics of Machine Learning, implementation of a simple machine learning algorithm using python. Process of training and prediction involves use of specialized algorithms. It feed the training data to an algorithm, and the algorithm uses this training data to give predictions on a new test data. Machine learning can be roughly separated in to three categories. There are supervised learning, unsupervised learning and reinforcement learning.

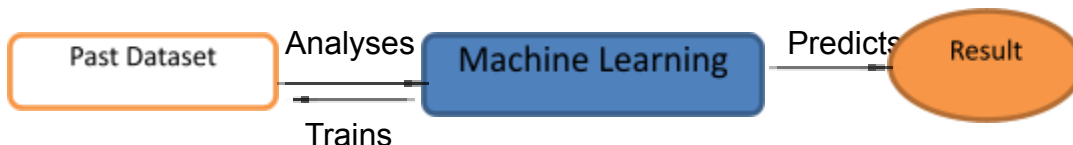


Fig: Process of Machine learning

recent years, Human Activity Recognition (HAR) through smart phones became a well known field of research. As we have entered the era of intelligent environment, the automated detection of Activity has become a point of high interest. Intelligent environments generally exploit information gathered from users and their environments in order to produce an appropriate action [16]. In this regard, different studies have been conducted in this field. Based on these studies, we observed that basic locomotion activities like Walking, Running, Sitting, Lying on bed can be detected with good accuracy rate [15]. However, similar activities, such as Going upstairs or downstairs, Slow running (Jogging), Fast Walking can not be detected perfectly [15]. It is important to detect these activities for development o

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## 6. Proposed System

The process of human activities recognition is very similar to a general-purpose pattern recognition system and corresponds to a set of steps ranging from data collection to activities classification. This process involves a set of transformations of the raw data extracted from sensors to generate efficient classification models of human activities. While applying photo **graphic-based** method is critical to evaluate parameters and it's taken data size is high

To overcome this method to implement machine learning approach by user interface of GUI application

Multiple datasets from different sources would be combined to form a generalized dataset, and then different machine learning algorithms would be applied to extract patterns and to obtain results with maximum accuracy.

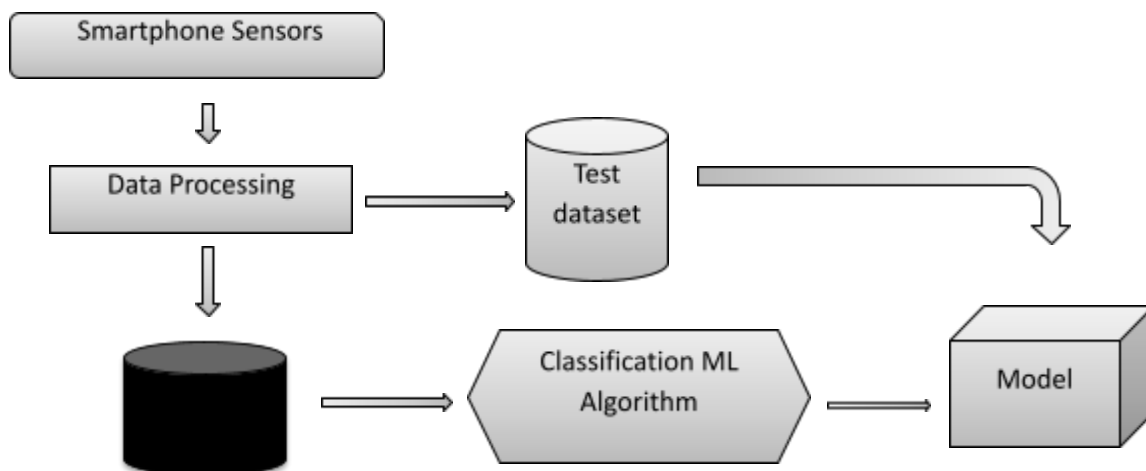


Fig: Architecture of Proposed model

### 6.1 Advantages:

These reports are to the investigation of applicability of machine learning techniques for air quality forecasting in operational conditions.

Finally, it highlights some observations on future research issues, challenges, and needs.