

Activity Recognition Using Filtering Algorithm

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Abstract— This paper inspect the trouble in recognition of exercise and also discover the burned calories after exercise. Our topic and motive of research to detect a problem, how walking, jogging and running effect on the human body using personalize algorithms. Pedometer is a device which is used to count the step while walking. This device may be used as a hardware device which attached with the body or may hold on body like in hand and count the steps. Every person have different way of walking and also difference in step distance, an informal calibration, performed by the user. An accelerometer is a device that measures proper acceleration. It is not necessary that accelerometer always measure a proper acceleration for each coordinate acceleration But the benefit of this research, it remotely observe the moves, calories and find accurate results in jogging and running. There are specific algorithm used for finding the difference between the jogging and running, and detect the burned calories. Whole research performed in MATLAB platform. This platform is very reliable and flexible to use.

Index Terms— Low pass filter, high pass filter, Threshold, walking, jogging, running MATLAB.

1 INTRODUCTION

THE activity reorganization algorithms working on a device that is called as pedometer. A pedometer is a device, generally transferable and electronic or electromechanical, that calculate each step taken by detecting the motion of the body hips [1]. As the analysis, walking is very useful exercise to maintain body. It also helpful to get the information and readings about the moves and burned calories. The whole recognize will working on the three activities. This thesis is the process to filter the accurate results in walking, jogging and running. There are number of applications are available on the mobile app. stores. We are using personalize two algorithms on the place of accelerometer and gyroscope to obtain the accurate results in jogging and running. This concept widely used in exercise machines.

To SUB OBJECTIVE: The sub-objective of this project are

- To implement this concept in Matlab.
- To create a algorithm for the filters and another algorithm for detecting exercise.

2 REVIEW STAGE

2.1 RELATED WORK

In this research, we discover that every exercise need a exact limitation that is also called as working threshold. Pedometer is a device which is used to count the step. There are a lot

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of algorithms and working platform are available to describe the pedometer. Some related working ways are described below:-

In a research work, the Nokia create a wrist-attached sensor platform which developed at the nokia research Center during one project to make possible research, show of utilize for wearable and wireless sensors. This wearable pedometer application was applied as one of the display of the capability of the platform. The step counting algorithm is describe and the performance is assess. The platform is design for running exercise. However, the step detection during walking is also discussed. 3-axis accelerometer and step counting algorithm are used for linear acceleration data. Step counting with help of wrist is an motivating topic. These exercises shows that it is possible but with the lot of challenges. This is functional step counter. improvements are probable and they have been well-known while working.

Human action or movement becomes an necessary factor of many applications for computing. In this paper describe about the iLearn system for classify a body activities using the Apple iPhone's 3-axis accelerometer and the Nike + iPod game Kit. Results propose activities as well as running, walking, bicycling, and sitting can be recognized without any guidance by an end-user.

A. Problem in similar exercise detection

This research work was conducted to statistically recognize the walking, jogging and running activities using the mobile sensors. With the appropriate application for exercise, monitoring energy consumption of calorie compensation. With the help of a method this application get the each activity for analysis. To recognize all exercise data it accelerate data were continuously recoded from the subject performing each activity from 50 m. in distance and take 20 seconds to show the given results in statically way.

Be owned the whole work its method is not able to show distinguish between jogging and running.[3]

B. Head detection problem

In an another research which based on the to acquire accurate results for head and step detection. Smartphone sensors are used with specific algorithm for receiving the input. A person hold the mobile in hand or pocket and move then its acceleration take input from the mobile sensors. Three operations are performed in this paper. Distance estimation, user heading interface and particle filtering. This whole process is used to set the proper output for head and step detection. There are some personal algorithms are used in these paper that are not declared yet. But there is major cause in this technique it get lot of errors while head detection. The head detection and magnetic interface are the major problems.[4]

Step Detection:- This algorithm is robust to random performing motions, Like- walking or not.

Stride Length Estimation:- It provide estimation for each step or changing in position.

Heading Inference:- It detect the head position.

End-To-End System:- It shows the indoor positions using smart-phone.

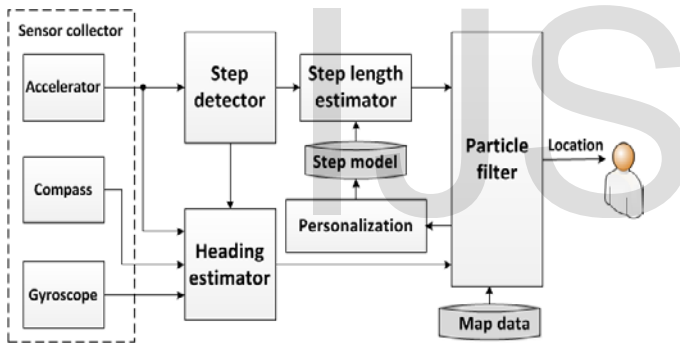


Fig : The overall system architecture

C. Problem formulation

Define Identifying the specific threshold where there pervious research not performing accurate working.

- Analyzing that how those reading from accelerometer and gyroscope are being misinterpreted.
- Developing an algorithm in MATLAB for improving the performance of the moves by improving its decision making.
- For detecting the proper signal 1st create algorithm for on low pass filter and high pass filter that filters works on the place of accelerometer and gyroscope.
- Calculating the No. of calories burnt by someone person with increased accuracy.
- There may be difference in men and women Calories burned process or algorithms.

This is another algorithm, it shows the working of step detection and accurate working of pedometer. It get accuracy of the displacements measured at the step level cumulatively impact on the result.[8]

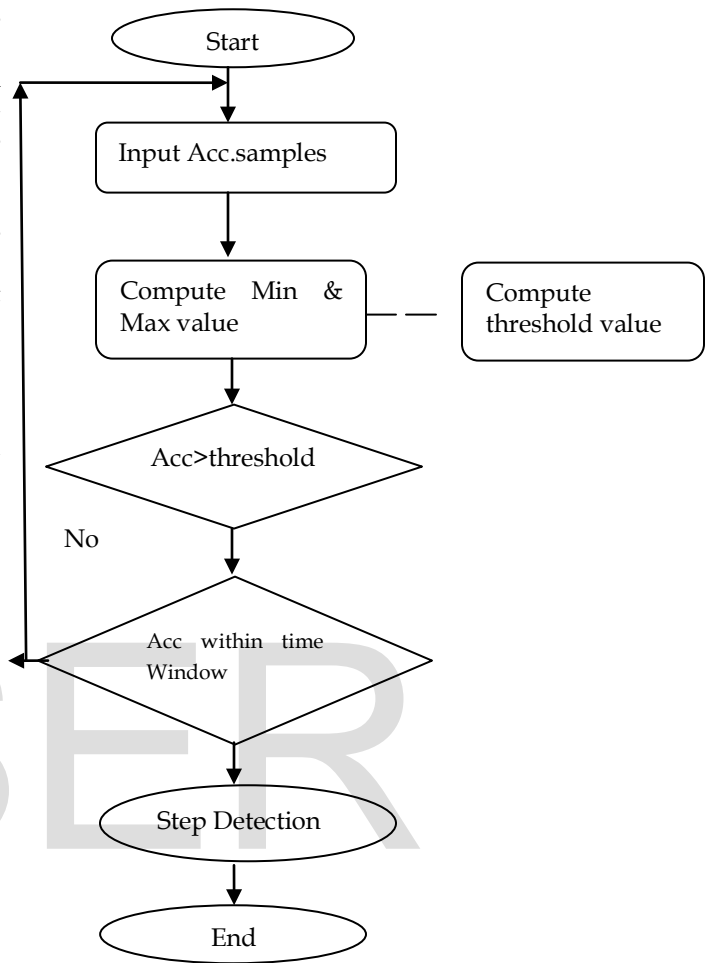


Fig. Head detection problem

CONCLUSION

There are lot of algorithms use here for exercise reorganization. The whole study about the working of pedometer use specific personalize algorithms to specify the accurate output. Like filtering algorithm [4] and machine learning algorithm [6] are effectively working on the testing but there may not get accurate results or there may be some problem in detection. After working with these algorithm we create a new algorithm which is very helpful to get accurate results. Some working ways are (1) Create a signal (input), (2) Filter the input according to the algorithm,(3) High Pass Filter and Low Pass Filter (4) Compare input signal (5) Recognize the final output/ re-

sult. When we perform different experiments then get new results.

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