

Smart Technology for Gesture Recognition using Accelerometer

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This paper describes about the smart technology which is the need of this hour to make the hospitals smart. All kinds of patients need monitoring and immediate attention in times of emergency as well as daily needs and among those the bedridden patients are the most dependent ones. So the project aims at easing their lives by providing assistance to the patients with absolutely no delay. By just making a few tilts on the android devices, the patient gets the required assistance which avoids complexities and makes the hospital to function smoothly and well co-ordinated.

Keywords: MEMS accelerometer, Gesture recognition, Human robot interaction

I. INTRODUCTION

A. Problem Statement:

To develop a Smart Gesture Based Device Using Accelerometer for patients in a hospital with a smart environment.

B. Goals and Objectives:

- 1) Low cost device to help patients get assistance.
- 2) Prevents situations from reaching a critical point
- 3) Keeps the nurses and doctors up to date
- 4) A priority based algorithm for prioritizing the tasks efficiently
- 5) Dedicated server to check on the management of notifications and actions taken
- 6) On receiving a critical alert, it has to be mandatory for some doctor to attend to the patient and make sure condition is stabilized.

C. Statement of Scope:

- 1) Input: Patients will use their mobile devices and make one of the following gestures:
- 2) Left tilt: Nurse assistance
- 3) Right tilt: Demand for food and medicines
- 4) Vigorous Shake: Critical problem/Doctor

D. Motivation:

The patients in hospitals need continuous monitoring and medical assistance frequently, hence this technology will make sure that the patients need not be dependent and also the hospital authorities can function smoothly.

II. LITERATURE SURVEY

Paper [1] describes a wearable gesture-driven device which shows feasibility of hand gestures on a mobile application. The system is based on the theory of fusion of Accelerometer signals and Accelerometer signals Surface Electromyographically. A device which can be worn is used to detect ACC and SEMG signals, and an algorithm is used to classify these gestures on the device. Paper [2] states various models which are based on gesture recognition, mainly three. These models are algorithmically capable to detect the non-specific gesture. The results are recorded using the 3-axis MEMS accelerometer used for gesture detection. The accelerometer which is shown in paper [1] detects the motion of a hand in three perpendicular axes respectively. This signal is then

pass on to the PC via the Bluetooth. Sign sequence of gesture motion is the significant feature shown in paper [2]. This system is uses for non-specific gesture recognition in less time with greater accuracy. Paper [3] uses SLR (Sign Language Recognition) technique to detect sign languages actions mainly for huge vocabulary sign recognition system.

This system also uses the concept of an accelerometer for gesture recognition and is effective and accurate. Paper [3] includes multichannel electromyographically sensor for hand gesture recognition. In paper [3] tell us about a gesture segment i. e start and end point of a gesture segment The intensity of the EMG sensors and the start point and end point of the segments determine the gesture detected. Paper [4] describes gesture recognition and its use to detect our usual movements and integrate a robot assisted living in our daily lives. Paper[5] tells us more about multiple gesture recognition using EMP signals and using its intensity to determine detection of multiple gestures.

III. PROPOSED SYSTEM

Basically the project is divided into two main parts:

- Android Application
- Website part

A. Android Application:

- 1) Once the Doctor/Nurse enter Login id and Password, their login request will happen through the server(HTTP) which will verify the Login Id and Password with registered Id and Password and IMEI number
- 2) If login is a success, the notification will come to the doctor/nurse's phone.
- 3) Patient will make left and right tilts to raise a request.
- 4) When request comes to the server, the room no will be identified through the IMEI associated with the phone.

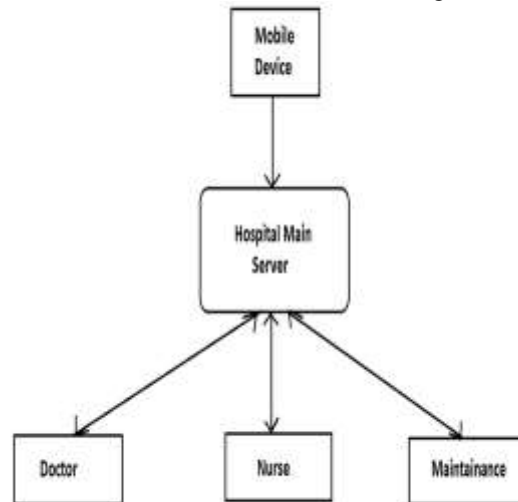


Fig. 1: Workflow

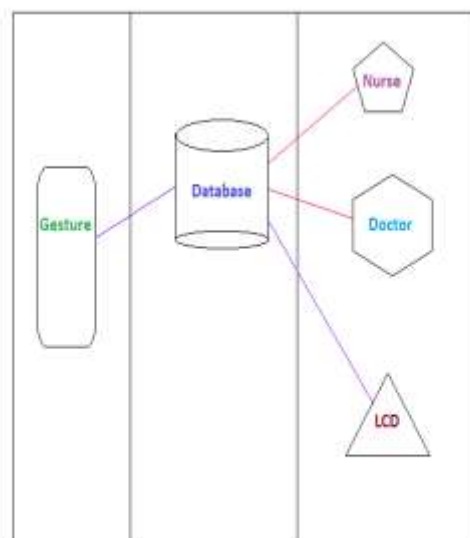


Fig. 2: Architecture Diagram

B. Website Part:

- 1) A website is created using JDBC for Java and MYSQL connectivity. A hospital Admin will be the handler of the web system
- 2) Admin will add /delete patient phones in the system
- 3) Admin will add/delete the doctor/nurse of the hospital system.

IV. RESULT

After running the program on Eclipse, the hospital website opens up. On performing all the correct steps, the android application runs successfully on the doctor and nurse's phone.

WELCOME NIMISH BENDRE					
HOME					
MAPPING					
DOCTOR/NURSE					
NOTIFICATIONS					
LOGOUT					
NO	NO				
1	222				11:46:58.0
2	222				11:44:32.0
3	222				11:44:18.0
4	222				11:44:10.0
5	222				11:37:32.0
6	222				11:37:26.0
7	222				11:37:17.0
8	222				11:37:12.0

Fig. 3: Admin monitoring

WELCOME NIMISH BENDRE **HOME** **MAPPING ▾** **PATIENT ▾**

DOCTOR/NURSE ▾ **NOTIFICATIONS ▾** **LOGOUT**

▼

PATIENT NAME

EMAIL ADDRESS
☒

PATIENT AGE

CONTACT PERSON MOBILE

PATIENT ADDRESS

PHONE NO

ROOM NO

ADD PATIENT **RESET**

Fig. 4: Patient Registration

WELCOME NIMISH BENDRE

HOME

MAPPING ▾

PATIENT ▾

DOCTOR/NURSE ▾

NOTIFICATIONS ▾

LOGOUT

▼

REGISTER AS

☐ Doctor ☐ Nurse

FIRST NAME

Enter First Name

EMAIL ADDRESS

☐ Enter email

ADDRESS

Enter Employee ID

USER NAME

User Name

LAST NAME

Enter Last Name

PHONE NO

Enter Phone No

IMEI

IMEI No

PASSWORD

Enter Password

CONFIRM PASSWORD

Enter Confirm Password

ADD RESET

This is a required field

Fig. 5: Doctor/nurse Registration

V. ADVANTAGES

Our Project aims at creating Smart environment and “Smart Hospitals” along with the ever-growing smart technology. It can easily overcome the drawbacks of the traditional methods of using bells, sirens and buzzers at hospitals. This project eases the life of patients and their family members.

VI. CONCLUSION

The accelerometer detects the tilts accurately which enables the correct notifications to reach the respective person on time. This ensures the patients safety and health. Thus “Smart technology for gesture recognition using accelerometer” is an innovative and useful method for the hospitals to keep their services well-coordinated and organized.

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