International Journal of Advanced Research in Arts, Science, Engineering & Management (IJARASEM)

| ISSN: 2395-7852 | www.ijarasem.com | Bimonthly, Peer Reviewed & Referred Journal|

| Volume 2, Issue 3, May 2015 |

Cloud Computation Using Gesture Control

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ABSTRACT: The existence of Gesture based communication has been from a long time. Presently there exists an advanced and natural form of interaction, named gesture based interaction. Gesture Computer Interaction has been applied in some fields successfully. Gesture-based interaction has advantages over traditional interaction which traditional interactions form cannot offer, this can be said from users point of view. The research of HCI has elevated much interest and attention. Many new applications have appeared and its importance can be felt in our life . A gesture is a motion of the body and it contains lots of information. IoT is an evolution of mobile, home and embedded applications which are connected to internet which integrates greater capabilities using data analytic, which tract meaningful information. In this, connected devices become an intelligent system of systems. These system of systems share data on cloud and analyze it, they can change our businesses, our lives, and our world in countless ways. Whether its medical outcome or we can deliver better quality products in low development cost, can make shopping more enjoyable, and more optimizing energy generation.
We implemented capacitive sensing. Through this technology we are proving gesture to our system. By the sequence of touch and release we can get different inputs which can be mapped to different events (services).This is easy to implement is less ambiguous compared to Swept frequency capacitive sensing(SFCS).

KEYWORDS: IoT, Cloud, Swept frequency, Arduino Uno, Gesture.

I. INTRODUCTION

Here, in our system we are using capacitive touch which detects the number of touch we are providing through our plates. Each counts of taps are considered as separate gesture to our project. For processing data that we are receiving from the plates we are using Arduino Uno (microcontroller). Here in this novel system we introduced system which can the recognize gesture and perform necessary computation like sending emergency message to the users contacts saved on users cloud, playing music, viewing mail. Cloud technology offers new services addressing the high growing demands of IoT. The scope of project is very bright, There are numerous applications of this system, as IoT based applications are the current technology requirement. Our system is a form of HCI advancement along with Cloud therefore, there is a wide range of applications which can be implemented through this system. This can also serve as a help to the blind, deaf, dumb people for their normal life activities without being dependent on someone else. Through this we are trying to lessen the work load and managing time efficiently using gesture.

- This system serves as a help to the blind, deaf, dumb people for their normal life activities without being dependent on someone else.
- This can also be used in panic conditions by simply providing gesture to avail emergency services.
- This is Intelligent HCI(HCII) using gesture to interface with computer
- Unlike previous gesture based HCI systems, this system makes any object touch sensitive by using capacitive sensing technology.
- Through this we are trying to lessen the work load and managing time effectively using gesture.
- This system can be easily extended to ubiquitous computing world and smart environment which was very motivating.

II. RELATED WORK

Following are the few popular systems:

A. Vision-based Gesture Recognition -The input of this gesture recognition takes hand gesture image as an input which that taken by a webcam or camera, firstly, gray scale image converted into equal binary form or frames. As some error is introduced in binary image and hence there is a need remove these errors. After finding the real binary image, features extraction is performed. Then this detected feature makes it possible to enhance the edges, which is mapping to the hand gesture to recognize different gestures.

B. Motion Capture Sensor Recognition - Such recognition technique made it possible to implement an accelerometer based system to communicate an robotic arm wirelessly. This work focuses on gesture

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recognition by analyzing data obtained by motion sensors (e.g., the Microsoft Kinect1, the ASUS Xtion PRO2 and the Leap Motion3 sensor which can track only the hands with more accuracy). The output of these sensors is streams of data with vectors of features describing the human body with every change in position or posture.

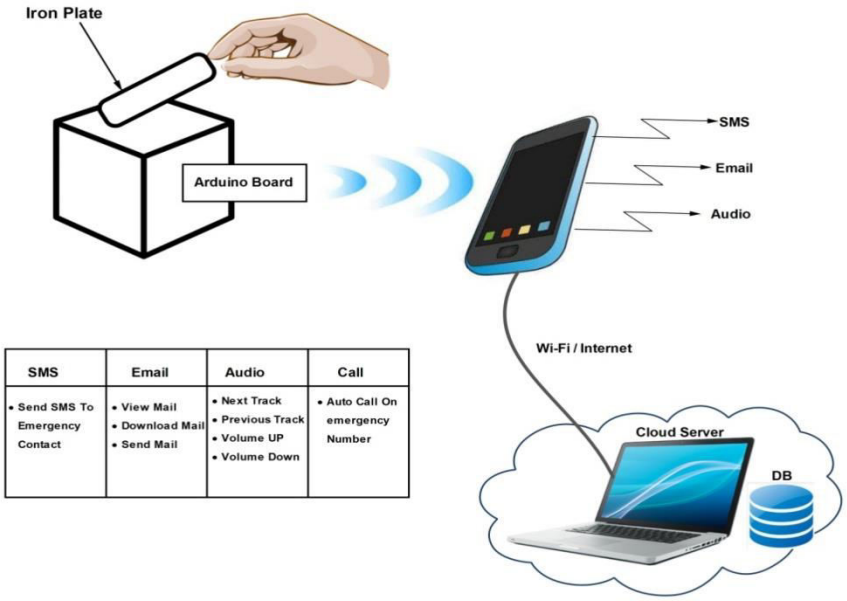
C. Accelerometer-based Gesture Recognition - This Gesture Recognition methodology has become extremely popular. A sensor is used which is integrated to a tri-axes accelerometer chip as a hand held input device. When gesture is performed, the sensor accumulates the data by accelerometer, and sends it is send to PC by a wireless protocol. Several research and study has been done under Artificial Neural Networks (ANNs) for this system's implementation.

D. Conventional most common capacitive sensing techniques are quite similar. When user touches the electrode, a weak capacitive link is formed between the electrode and conductive fluids inside the human hand, this alters the signal supplied by electrode. This happens because the user body introduces a new path for flow of charges, acting as a charge sink .By measuring thedegree of this signal change, different touch can be detected. It is a very simple and cost effective method ,all it requires is a simple conductive element ,this implies almost all the objects can be make touch sensors.

Camera based system to detect gesture have one disadvantage that their efficiency reduces in low light, They may even not function when there is no light. Considering other gesture recognition systems, all other system is are way costlier than Arduino based touché system, also they do not offer greater efficiency.

III. WORKING

1. Object senses the touch gesture given by user to it, which then further read the value and then it forwards that data to Arduino Uno Board.
2. Arduino then process the data which was provided by user. It then assign some value to it, which is then forwarded by the Arduino to the android mobile through bluetooth connectivity.
3. In our system we used Bluetooth shield over Arduino Board to transmit processed data from Arduino to android mobile phone.
4. Cloud is a virtual environment which provide us storage unit. Cloud creates virtual storage unit, which you can access anytime from anywhere. In cloud we are storing all the contact details as well as the message that we want to send to contact numbers in case of emergency.
5. So when we provide gesture for sending emergency message to object it will get all the contact details of user which all are saved in cloud and then forwards respective messages to them.
6. Our system also email them the emergency messages
7. It also provide facilities to play music, view mail, forwarding emergency call.



SMS	Email	Audio	Call
• Send SMS To Emergency Contact	• View Mail • Download Mail • Send Mail	• Next Track • Previous Track • Volume UP • Volume Down	• Auto Call On emergency Number

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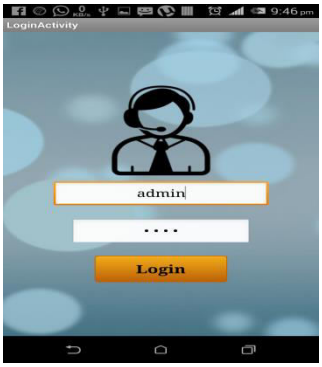
IV. EXPERIMENTAL RESULTS

Step1: Enter the LAN connection id to which you want to connection

Step2: Enter the email Id through which you want to send emergency messages

Step3: This will show login page of application. To login into application you have to enter correct username and password.



Step4: Now we get to see the Menu options which allow us to do various tasks. We will go to Main control where it will recognize different gestures and take actions according to it.

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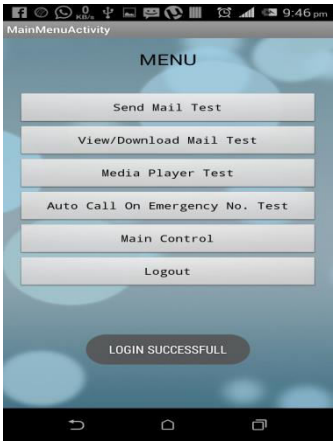
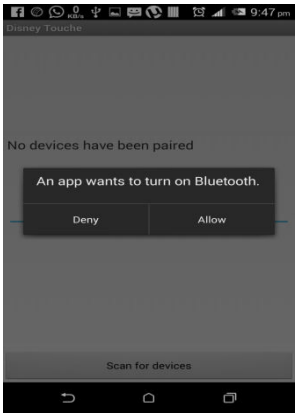
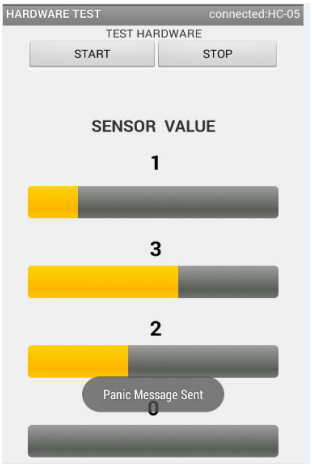


Step5: When we click on Main control it will ask for bluetooth connectivity and will search for device Arduino for sensing the gestures provided to Arduino.



Step6: When it gets connected to the device, it starts reading the values from the device. The moment it receives correct value for which it suppose to perform some action, it does. Like here in the bellow image it is sending panic message.



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V. ADVANTAGES AND DISADVANTAGES

1. ADVANTAGES
- Easy to use.
- The sensor object can be anything, enables us to make things around us recognize intricate configurations of the hand or body that is doing the touching.
- Wide variety of applications.

2. DISADVANTAGES
- Uninterrupted internet access.
- System needs to be active all the time.

VI. APPLICATIONS

1. Health Care

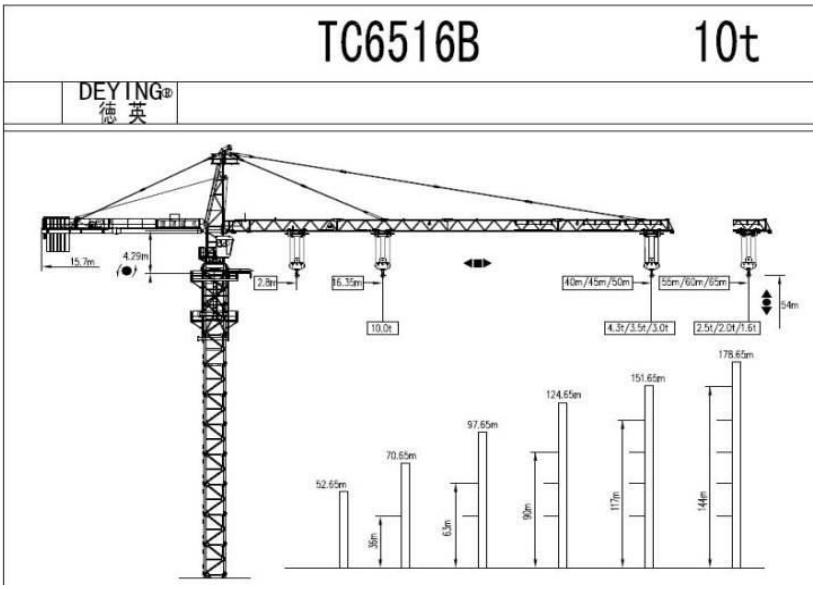
Could be used by patient to call for emergency help to doctor or nurses.

2. Smart Home Automation System

Providing security to lockers in our home and inform us about the intrusion detection when anyone touches the locker.

3. Industrial Use

We can use our technology in cantilever cranes which can move horizontally over a track. Jib Cranes comes under the category of cantilever cranes.



To balance the whole object load it adds extra load at the other side, but it also have a breaking point, i.e. if extra load is too close to the platform then the crane will loose its balance and will fall down. So our system could give them a security warning to stop the further movement of Jib platform or could directly stop the engine by sending interrupt to the system to which it is connected.

VII. CONCLUSION

So here we have successfully implemented our system that accesses the services of cloud, using the information of database by providing gestures. Our device could send panic message, email, can forward call as well as play music for entertainment.

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