Sensor Integration for Smart Security

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Abstract - *Context-awareness is getting progressively important for a range of mobile and pervasive applications on nowadays smartphones. Though human-driven settings (e.g., indoor/outdoor, at home/in office, driving/walking) have been widely researched, few attempts have studied from phones' point of view (e.g., on table/couch, in pocket/hand/bag). We refer to such immediate-surroundings as micro-environment, normally a few to a dozen of centime-ters, around a phone. In this study, we designed and implement Sherlock, a micro-environment sensing platform that automatically records sensor hints and describes the micro-environment of smartphones. The platform keeps running as a daemon process on a smartphones and gives _ner-grained environment information to upper layer applications by means of programming interfaces. Sherlock is a brought together structure covering the significant instances of phone use, situation, disposition, and cooperation in down to earth utilizes with entangled client propensities. As a long-term running middleware, Sherlock considers both vitality utilization and client friendship. We model Sherlock on Android OS and efficiently assess its execution with data gathered on _fteen scenarios amid three weeks. The preliminary results demonstrate that Sherlock accomplishes low energy cost, fast system deployment and competitive sensing accuracy.*

***Key Words*: Proximity sensor, Accelerometer meter, Camera, Pressure Sensor, GPS.**

1.INTRODUCTION

A smartphone is a handheld personal computers with a mobile operating system and an integrated mobile broadband cellular network connection for voice, SMS, and Internet data communication most if not all smartphones also support Wi-Fi. Smartphones are also able to run a varity of software components known as “Apps”. Most of the apps come pre-installed with the smartphones but some apps can be downloaded from places like google play store or apple app store. Apps can receive Bug-fixes and gain additional functionality through software updates. Similarly Operating System are able to update. Propose system is buildup from different modules. User could be used application for daily life for automatic call pickup and save battery by switch off display while ringing mobile in pocket or bag. Application get microphone input and provide to application then system inform to main authority if sound is greater than threshold value. People try to unlock phone, they use trial guess to unlock phone pattern that time system capture photo of unauthorized person who try to use mobile and send mail to registered email id. User could send emergency SMS to relatives if user feel unsafe. If users mouse pointer not working then propose system could be used to control mouse pointer by using mobile screen. If user miss meeting or lecture then they can attend lecture or meeting by web cam module in propose system. We are trying to utilize different sensor data and build system that provide more facility.

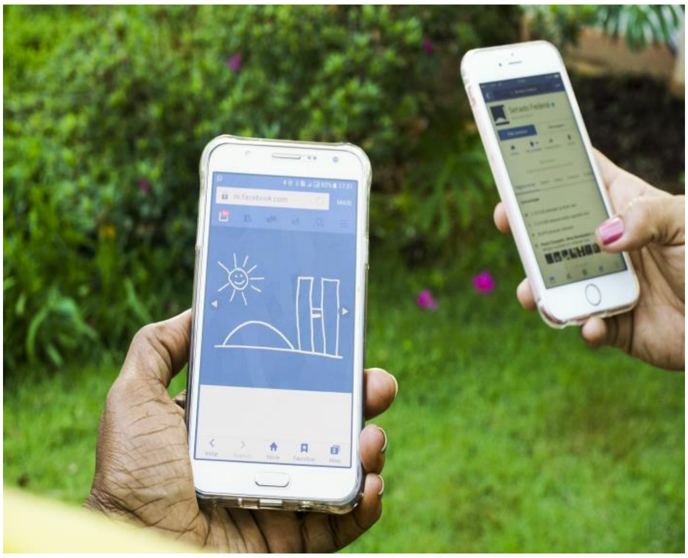

Figure 1: Android smartphone and Iphone.

1.1 Motivation of the Project

Now days mobile comes with different sensor in chip prize. These sensor could be used for different purpose. By utilizing those sensor we can build system that provide solution for different problem in single application. Our primary aim is to design and implement a mobile sensing application that allows measurement, analysis, and storage of smartphone sensor parameters. Participatory sensing enables acquisition of large number of measurements in short time, therefore it is our method of choice.

1.2 Related Work

People are using stealth sensors to detect intruders due to their low power consumption and wide coverage. It is very important to use lightweight sensors for detecting real time events and taking actions accordingly. In this paper, the focus is on design and implementation of wireless surveillance sensor network with acoustic and seismic vibration sensors to detect objects and/or events for area security in real time. To this end, introduction of a new environmental sensing based system for event triggering and action. The concept of IOT is used and is given importance in this system as it is considered as one of the most important development and will affect the life of humans in near future. In Google, about 1500 volunteers were chosen and there daily use of smartphone was recorded for over several months. A large scale study has been presented based on neural networks which is used to interpret natural human kinematics. A comparison of several different neural architectures for efficient learning of temporal multi-modal data representations .Results from this paper conveys that human kinematics convey important information about user identity. Multi-modal frameworks are more likely to provide meaningful security guarantees. A combination of face recognition and speech, and of gait and voice have been proposed in this paper [1],[2].

2. Mobile Sensors and Uses

Accelorometer:

Accelerometers handle axis-based motion sensing and can be found in fitness trackers as well as phones—they're the reason why your smartphone can track your steps even if you haven't bought a separate wearable

Gyroscope:

The gyroscope helps the accelerometer out with understanding which way your phone is orientated— it adds another level of precision so those 360-degree photo spheres really look as impressive as possible.

Gps:

GPS units inside phones gets a ping from a satellite up in space to figure out which part of the planet you're standing on (or driving through). They don't actually use any of your phone's data, which is why you can still see your location when your phone has lost signal, even if the map tiles themselves are a blurry, low-res mess.

Proximity sensors:

The proximity sensor usually sits up near the top speaker and combines an infrared LED and light detector to work out when you have the phone up to your ear, so that screen can be switched off. The sensor emits a beam of light that gets bounced back, though it's invisible to the human eye.

Ambient light sensor:

The ambient light sensor does exactly what you would expect, taking a measuring of the light in the room and adjusting your screen's brightness accordingly (if indeed it's set to auto-adjust).

Figure 2: Various sensors in a smartphone.

3. Proposed System:

We proposed an application, a micro-environment sensing platform that automatically records sensor data and characterizes the micro-environment of Smartphone's. The platform runs as a daemon process on a smart phone and provides finer-grained environment information to upper layer applications via programming interfaces. Our platforms run in middleware stage and provide data which is captured by various sensors to the application which we use in our application via programming interface. Our application is a unified framework covering the major cases of phone usage, placement, attitude, and interaction in practical uses with complicated user habits. As a long-term running middleware, an application considers both energy consumption and user friendship. We developed an application on Android OS and systematically evaluate its performance with data collected. The preliminary results show that an application achieves low energy cost, rapid system deployment, and competitive sensing accuracy.

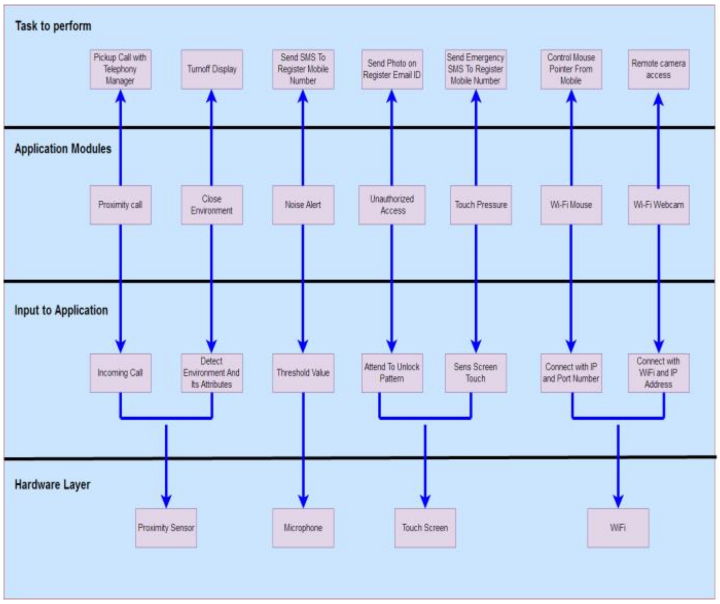

Figure 3: System Model

4. Mathematical Model

1. Let 'S' be the system

2. Where

S= {I, O, P}

3. Where,

I = Set of input(information related to user)

O = Set of output (recommended list of police station and hospital)

P = Set of technical processes

4. Let 'S' is the system S = {…………Identify the input data S1, S2, …. , Sn}

I = { current location, proximity sensor data, mobile unlock password, microphone sensor data, touch sensor data,

mouse point coordinates, images, video }

5. Let 'SD' is the Sensor Data

SD={SD1,SD2,SD3,SD4…..SDN}

SDK={latitude, longitude, proximity sensor data, sound, touch sensor, X & Y coordinates of mouse, image stream }

6. K=0,1,2,3,-----N.

Procedure:

1. Identify the Process as P

2. Take the input from proximity sensor, check weather mobile in pocket or in bag. If mobile is close to something then switch off the display

3. Take the input from microphone, if sound is greater than predefine threshold then system generate alert message and send SMS to predefine number.

4. Take the input from touch screen sensor if user touch the screen for long time period then system generate

emergency message and send SMS to predefine number.

5. Take input as X & Y coordinates then move the mouse pointer according to X & Y coordinates.

6. Take input from mobile camera and display live video stream output.

7. Identify the output applications as O

• O = {switch off display, capture photo for wrong password, send alert SMS if sound is greater than threshold, send emergency SMS if screen press for few seconds, control laptop mouse pointer from mobile, watch video in laptop}

5. CONCLUSIONS

Sensors are the key factors of developing more and more interesting applications on the smartphones, and the sensors make the smartphone different from traditional computing devices like computer. Most applications used accelerometer and gyroscope because they are somehow the most accurate sensors. However, the vision contains huge information. We believe that camera and pattern recognition will be used more and more in the future. We present a simple but yet practical platform for micro-environment sensing for smartphones via collaboration among built-in sensors. The platform automatically collects sensor hints and characterizes the immediate surroundings of smartphones at centimeter level accuracy, providing fine-grained environment information to upper layer application.

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