Smart Mobile Sensing

Dawange sagar[1], Bhavsar Dhavalkumar[2], Jadhav Urmila[3]

[1,2,3]Student, Information Technology,
SVIT ,Nasik, India,
E-mail:
[1]dawangesagar1001@gmail.com
[2]dvbhavsar99@gmail.com
[3]urmilajadhav01@gmail.com

Abstract: Context-awareness is getting increasingly important for a range of mobile and pervasive applications on nowadays smartphones. Whereas human-centric contexts have been extensively researched, few attempts have studied from phones' perspective We refer to such immediate surroundings as micro-environment, usually several to a dozen of centimeter around a phone. Context-awareness is getting increasingly important for a range of mobile and pervasive applications on nowadays smartphones. Whereas human-centric contexts have been extensively researched, few attempts have studied from phones' perspective We refer to such immediate surroundings as micro-environment, usually several to a dozen of centimeter around a phone. In this In this work place, we design and the instrument first, in front a front a micro-environment sensing flat structure that automatically records sensor small signs (of) and gives account of qualities the micro-environment of computer-helped telephone. The flat structure runs as a daemon process on a computer-helped telephone and provides higher in quality grained general condition knowledge to upper level applications via listing of knowledge processing machine orders connections. First, in front is a joined framework covering the major cases of telephone use, giving place, attitude and effect on one another in useful uses with complex user regular ways. As an in the long run running middleware first in front gives thought to as both power for a given time using up and up and user friendship. We would design a prototype Scout on Android OS and systematically evaluate its performance with data collected on fifteen scenarios for three-four weeks scenarios. The first stage result let see that first, in front gets done low power for a given time price quick system placing and in competition sensing having no error. The first stage results let see that first, in front gets done low power for a given time price, quick system placing, and in competition sensing having having no error.

***Keyword* - Context-Awareness Pervasive application Micro-environment Energy consumption, Accuracy.**

I. INTRODUCTION

In mobile systems, context-awareness is a computing technology that incorporates information about the current environment of a mobile user to provide more relevant services to the user. It is a key component of ubiquitous or pervasive computing and has attracted many research efforts in the past decade.

Most context aware application (through readily moved telephone sensing) are Human-centric (be conscious of) having seen before contexts from user view (e.g. indoor/outdoor at home/office driving/ walking) such news given supports services according to users place, position. For example, when a mobile phone detects that its user is driving it automatically blocks phone calls if its user is holding it in hand for safety. When a user enters a building, it is unnecessary to keep his phone's GPS working to save energy. Similarly, Wi-Fi is usually unavailable in the open countryside and should be turned off there. [9][2]

We say something about the most near everything nearby i.e. several to a twelve of centimetre's around a telephone as micro-environment like to human centric Conditions, being having knowledge of micro-environments is directly good to a wide range of telephone application. For example, if readily moved telephone is in a bag or pocket, it is useless to light up the screen when telephone is coming. In addition if a telephone is placed on a long seat rather than on a writing-table it is better to turn up ring book to keep from lost names.

Given accurate microenvironment knowledge, a telephone can adjust its behaviour automatically and right. In this undertaking we design first in front a micro-environment sensing flat structure that automatically records sensor small signs and gives account of qualities the most near everything nearby of computer-helped telephones. It runs as a daemon process on a smartphone and provides finer-grained environment information to upper layer applications running on the smartphone.

To implement such a platform, difficulties are triple. First, previous context-aware solutions (especially the algorithms and metrics) are assisted by human intuition; however, the microenvironment are less sensible for people. Second the usage giving a place, attitude, and effect on one another of computer-helped telephones (make, become, be) different across time and user thus making complex timely and accurate micro-environment discovery. Third, distinguishing similar microenvironments relies on systematic collaboration among multimodal sensors. We build the framework of Scout upon an investigation of phone usage and user habits.

II. LITERATURE SURVEY

In previous work done we studied, we can see that all the work done are targeted application on a single sensor. They are making one application by making the use of facts broadcasted by sensor. This application will destruct more apparatus for producing electric current as it has to run as an unbroken stretch. They have not made any supporting application to but for the apparatus for producing electric current. In our paper, we are getting greater, stronger, more complete many applications which come under safety and making the most out of lands ruled over.

III. DESIGN

The aim of micro-sensing on smart phones is to provide a more general (very simple/from a time very long ago) for novel human centric computer program especially in health care. Healthcare and behaviour watching/supervising. For example it is important to make sure that the healthcare monitors are attached to the target user during his daily life and newly appearing (popular things/general ways things are going) arise to (do/complete) such takes smart phones. A (separate environment in a small area) perceivable smart phone therefore would remind it's therefore, would remind its user if it is not carried by its user via e.g. its therefore would remind its user if it is not carried byits user via, e.g. its built-in speaker, and further informs him of its location. Identifying the phone's micro-environment also opens new possibilities to perform fine-grained context-aware energy saving strategies, which is essential for battery powered smartphones. On detecting being placed in the drawer, for instance, it is reasonable for the phone to infer that it will not be used in the near future, and can switch to certain power saving mode and turn off unnecessary sensors and software. In addition Scout enables more accurate inertial based localization and navigation [11]

IV.PROPOSED SYSTEM

Our undertaking is chiefly of different parts of a greater unit like automatic telephone picker force sensor used for safety, GPS sensor to a bit the bit the placing when wrong good example gone in, came in, soft top discovery in order to activate the ringer most frequent number, shut general condition seeing who a person is for apparatus for producing electric current amount made less purpose and so on. We are using multiple sensors in this project so we need to write different parsers for each sensor we are using. We are taking care of battery optimization also in this project to make it more efficient.

Sherlock, a micro-environment sensing flat structure that automatically records sensor small signs and gives account of qualities the micro-environment of quick, sharp mind phone. The flat structure runs as a daemon process on a well-dressed telephone and provide finer-grained general condition condition knowledge to upper level applications via listing of knowledge processing machine orders connections. Sherlock is a joined framework covering the major cases of telephone use, giving a place, attitude, and effect on one another in useful uses with complex user tendencies. As an in the long run running middleware Sherlock gives thought to as both power for a given time using up and user friendship. We make into a first working design Sherlock on android OS and regularly value its operation with knowledge for computers self-control on 15 event-ready spaces during three weeks.

The first stage results play or amusement event that Sherlock gets done low power for a given time price, quick system placing and in competition sensing having no error. The sensor which we are going to use in our application are accelerometer, vibrator, touch screen screen, Camera, gyroscope being near and so on. If a readily moved telephone is in a bag or pocket, it is useless to light up the screen when a telephone is coming also if a phone is placed on a sofa rather than on a desk, it is better to turn up ring volume toavoid missing calls. Given (very close to the truth or true number) micro-(surrounding condition) a phone can change a little and get better its behaviour automatically and properly.

Local Placement Recognition: This module determines daily on-body phone placements such as in-hand, in-packet, in bag, etc. Sherlock provide a simple yet working well order design with light and inertial sensors. Specially, the system first makes discovery of whether the telephone is in hand by having relation to all round illuminative condition around the telephone. If not then, Sherlock gives account of qualities the nothing like I it moving designs of phones in different nearby giving places within-built accelerometer, by the making use of a forceful. Time bending twisting DTW based time number, order, group, line matching design to taken the special nearby giving a place. Telephone effect on one another discovery: This part of a greater unit takes to be the same whether the user is actually often the user is actually using the telephone like browsing. Although such effected one another often comes to mind when the telephone is in-hand the telephone effect on one another discovery part of a greater unit emphasizes more the semantic view Sherlock great acts common screen-lock on well-dressed phones and process change on OS to make out whether the user is actually acting between among with his telephone.

Backing Material Detection: This module differentiates hard/soft material via smart phone generated vibration pattern.

Sherlock focuses on two parts of the vibration patterns:

I. The phone's mechanical movement and
II. The sound related feature which can be (recorded on a camera or computer) by embedded Acceleration-measuring device and microphone (match up each pair of items in order).

To this end Sherlock extract a series of light weight features from increasing speed/ acoustic traces in both time and frequency domain and class-if lies backing materials like leather chair, wood wood deskor glass table. We develop a simple yet ef fective local placement (separating and labelling plan) with light and (slow or no movement/the force of something moving) sensors. The key (understand-ings of deep things) are double.

I. When carried by a User the phone is mostly placed in either semi-closed/open environment like in hand ,or closed environments such as in-pocket and in-bag. The extent of covering leads to different (people who claim to be smarter than everyone else) condi-tions for the phone, which can be (recorded on a camera or computer) by its built-in camera.

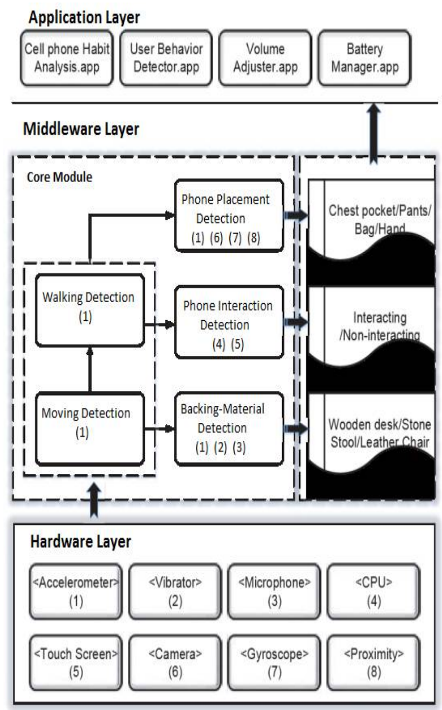
II. Different local surroundings offer (having a unique quality) (related to space or existing in space) degree of freedom, which is magnified when the user is moving.For instance, a phone is likely to experience stronger movements whenput in pants tha n inside a handbag.

These (like nothing else in the world) movement pattern can be perceived by the accelerat-ion-measuring devices. The 'in-hand' state is differ-ent from on-body placement on that the phone is not completely covered by surrounding object. Although the front-mounted closeness sensor can perceive sheltering in front, the phone is unaware of that back- wards.[9][13]

This way with closeness sensor alone, it is likely to miss some 'in-hand' cases e.g. when the user ismaking a phone call with his ear covers the fr-ont end of the phone. Therefore we also employ the back mounted camera for closeness perception back-ward. The reasons (for doing something) is that the worldwide contrast of a photo taken in closed (surrounding condition) is usually low, which is reflected in the grayscale histogram of the photo.

V. SYSTEM ARCHITECTURE

In most of these an actuator here stands for a type of motor that converts the energy typically electric current, into motion or mechanical operation. In mobile phone the actuator includes vibrator, camera and microphone.



Schemes a key parameter is the count of the user's footsteps, which is then multiplied by the average length of one footstep to estimate trace distance. Empirical studies have shown that the accuracy of step counter is sensitive to phone placement. For instance the counter usually generates accurate step count (i.e. consistent with the ground truth) when the phone is held in hand while often doubles the output count when the phone is placed in chest pocket. Hence knowing the phone's placement assists the step counter to eliminate erroneous output. Like GPS which helps to estimate user's coarse grained macro-environment, Scout deduces phone's fine-grained microenvironment. It serves as a light-weighted middleware for upper layer applications. [10]

As Figure 4.1 shows, Scout runs as a daemon process in the middleware layer. It employs sensors in the physical layer to record nature events and provides fine-grained environment information to upper layer applications. As a long-term middleware on smartphones, Scout optimizes energy consumption via a hierarchical, multistage architecture. Sensors, especially actuators, are carefully selected and logically triggered. Accelerometer, for example, is solely awaken to detect simple environment semantics, after which more sensors are triggered for complex environment classification. In what follows, we describe each architectural module in turn, specifying a high-level view of how the system works. Moving & walking detection. As a first step, Scout looks into the acceleration trace and identifies specific features in time domain. These features are then utilized to determine whether the phone is in motion. There are plenty of moving detection.[16][12]

VI.FLOWCHART

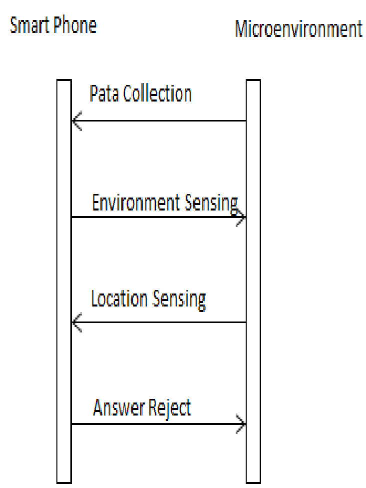


Fig 1. Existing System

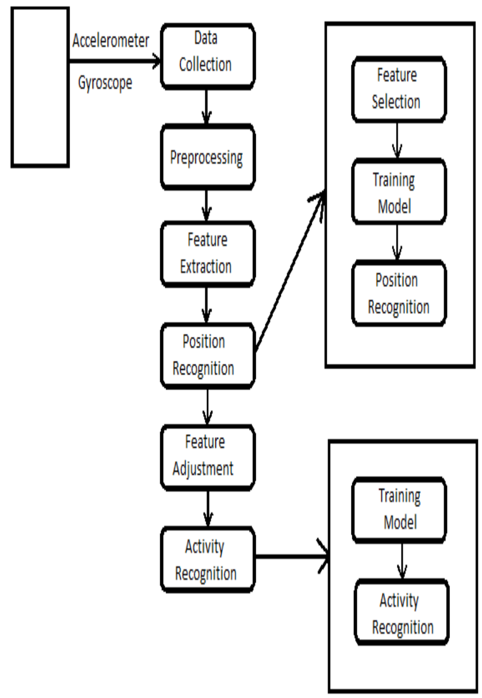


Fig 2

VII. IMPLEMENTATION AND ALGORITHM

5.1 Local Placement Recognition

We develop a simple yet effective local pla cement (separating and labelling plan) with light and (slow or no movement/force of something moving) sensors. The key (understandings deep things) are double. When carried by a user the phone is mostly placed in either semi-closed/open like in-hand, or hand, or closed (surrounding conditions) such as in-pocket and in-bag. The extent of covering leads to different (people who claim to be smarter than every one else) conditions for the phone, which can be (recorded on a camera or computer) by its built in camera. Different local surroundings offer (having a unique quality) (related to space or existing in space) degree of freedom, which is magnified when the user is moving. For instance a phone is likely to experience stronger movements when put in pants than inside a handbag. These (like nothing else in the word) movement pattern can be perceived by the acceleration-measuring device. As illustrated in the local placement recognition module is triggered once the 'Walking' state is serious and stubborn and it works as follows: [14][15]

1) The front mounted closeness sensor and the back mounted camera co-operate to identify semi-closed /open surroundings 'in-hand' state.

2) For closed (surrounding conditions), acceleration-measuring device is employed to automatically deliver sensory data for (having very small patterns/very detailed/only slightly different) placement identification,e.g. in pants, chest pockets or bags. We detail the processes follows.

5.1.1 Phone-in-hand Identification

The 'in-hand' state is different from on-body placements in that the phone is not the phone is not completely covered by surrounding objects.
Although the front-mounted the closeness sensor can perceive sheltering in front, the phone is unaware of that backwards. This way with closeness sensor alone, it is likely to miss some 'in-hand' cases, e.g. when. The user is making a phone call with his ear covers the front end of the phone. Therefore we also employ the back mounted camera for closeness perception backwards. The reason (for doing something) is that the worldwide contrast of a photo taken worldwide contrast of a photo taken in a closed (surrounding conditions) (e.g.in-pocket) is usually low, which is reflected in the grayscale histogram of the photo.[3]

As a motivating experiment, we collect photos taken by a background photographing application for various phone placements in diverse scenarios, including chest pocket, pants, bags and hands in supermarkets, cafes and streets. We will develop the following Image based Phone-in-hand Detection Scheme, Image-based Phone-in-hand Detection Scheme (IPDS). Firstly, the proximity sensor identifies the sheltering condition in front, and returns either blocked or unblocked. Meanwhile, the camera is triggered to take a photo.[5]

5.1.2 On-body Placement Recognition

On body placement recognition classifies closed (surrounding conditions) into finer-grained on-body placements such as in chest pocket, pants, bags, etc. As (before that/before now) discussed the module takes advantage of human ability to move around caused (slow or no movement/the force of something moving) patterns, which possibly limits its usage to truly 'mobile' phones. To compensate for this weakness, we propose a backing material recognition scheme based on phone induced vibrations specially designed for 'immobile' phones when the phone-holder stays still, or even when the phone is placed off-body (e.g. left on a sofa). The two modules are complementary and can cooperate to further enhance the recognition performance. For 'mobile' cases, though, the on-body placement recognition module proves to be sufficient for normal phone placement identification. As human induced mobility is mainly perceived by inertial sensors, we take a careful scrutiny on acceleration traces with different phone placements. Revisiting the acceleration traces with different phone placements, it is obvious that acceleration samples within a single footstep demonstrate unique pattern across different phone placements, while walking leads to a regenerative process of these acceleration patterns, indicating viability to take the acceleration traces as fingerprints for different phone placements.[5][8]

However, it remains unsettled whether the patterns of the same phone placement stay similar when taking device and user diversity into consideration. There may be some lags are due to different walking speed. In general, given a fixed sampling rate, a rush stride tends to shrink the trace pattern, while a stroll at leisure stretches the pattern and induces random deformation as well. Therefore, a robust and speed independent similarity metric is needed to compare and classify the measured acceleration traces. [7]

DTW-based Trace Matching (DTM). Dynamic Pattern of behaviour Time Twisting (DTW) is an energetic/changing programming based (thing that's almost the same as another thing) measure for sequences which may change/ differ in time or speed. In DTW the two sequences are first rebuilt by nonlinear "twisting" in the time domain to compare their (thing that's almost the same as another thing) independent of non-linear time related different versions. Therefore, DTW based trace matching is able to eliminate the effect of different walking speed. Given two acceleration profiles A and B with lengths of M and N samples, DTW first constructs a distance matrix d [M×N], where

$D(i,j) = (a_i - b_j)^2$ (1) and ai and bj are the ith and jth elements in A and B, respectively.
Taking d [M×N] as input, DTW returns a warping path P= {p1, p2, p3... pk}
Where, $p_i = (x,y) \in [1 : M] \times [1 : N]$ for $i \in [1 : k]$.

To generate the warping path, DTW constructs a cost matrix C [M×N] which stands for the minimum cost to reach any point (i, j) in the matrix from (1,1) in a dynamic programming fashion. For instance, (i, j) can be reached from (i−1, j −1), (i, j −1) and (i−1, j). The algorithm picks the one with minimum cost formally: A measured increasing speed trace is compared with all pre-stored traces collected with different phone placements based on DTW and output the similar minimum costs. The phone placement w.r.t the smallest cost is than identified as the phone placement for the measured increasing speed trace. [1][4]

For example, if C (M, N) = 25 for pants, C (M,N) = 36 for chest pocket and C(M, N) = 19 for bag. Then our scheme classifies this acceleration trace into the category of in-bag. The on-body phone placement recognition big plan/layout/dishonest plan does not depend on the closed (surrounding condotions) and so is orthogonal to the 'in-hand' detection in Section. Therefore the on-body placement detection big plan/layout/dishonest plan also serves as a double checking (for truth) to improve the strength and health of the in-hand detection big plan/layout /dishonest plan. This is useful when the IPDS suffers from low global contrast background like white wall all around or gloomy lighting conditions.

VIII. FUTURE SCOPE

In this project we are going to focus on 10 different modules in which we are developing auto call picker, mobile security as well as user security, Environment changer, battery optimizer.

- User Classes and Characteristics: The users of this application are normal people having android smart phone.
- Operating Environment: Android device we are using must have all the sensors needed for the application to perform well. Android 4.4 and above is needed.
- Design and Implementation Constraints: Need a mobile handset with all the sensors present to perform the tasks.
- User Documentation: User will be provided with all the user manuals and system information documents.
- Assumptions and Dependencies: The user is expected to use android mobile with OS 4.4 or above. The mobile should have proximity, accelerometer, and magnetic field detection sensors to broadcast the data.

IX. ACKNOWLEDGEMENT

We take this opportunity to express hearty thanks to all those who helped us in the completion of the project Phase-1 on "Smart mobile Sensing". We express deep sense of gratitude to our project guide Prof. P.V. Waje-Kashid and Head of Department Prof. R .S. Bhalerao, Assistant Prof., INFORMATION TECHNOLOGY DEPARTMENT Sir Visvesvaraya Institute of Technology, Chicholi for their guidance and continuous motivation. We gratefully acknowledge the help provided by our Project Guide Prof. P.V. Waje-Kashid on many occasions, for improvement of this project with great interest. We would like to extend our sincere thanks to our family members. It is our privilege to acknowledge their cooperation during the course of this project. We express heartiest thanks to my known and unknown well-wishers for their unreserved cooperation, encouragement and suggestions during the course of this project. Last but not the least, We would like to thanks to my all teachers, and all my friends who helped us with the ever daunting task of gathering information for the project.

X. CONCLUSION

In this paper we present the design, implementation, evaluation of Smartphone's sensing a platform for micro environment sensing for smartphones using various inbuilt sensors.We performed various experiments to evalute our prototype system implementation on Android platform.

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