Proximity Evaluation App for Face to Face Proximity Evaluation using Bluetooth on Smart Phones

Madhuja E. Bhole[1] Radhika A. Kale2 Suchitra B. Deokate[3] Prof. M. R. Hegade[4]
[1,2,3,4]Department of Computer Science & Engineering
[1,2,3,4]JSPM(BSIOTR) Wagholi, Pune, India

Abstract— An programmed system for human face recognition in a real time background for a company to mark the attendance of their workers. So smart presence using Real Time Face Recognition is a real world solution which comes with day to day actions of management employees. The task is very difficult as the real 'time background subtraction in an copy is still a experiment. To detect real time human face Haar cascade is used and a simple fast Principal Component Breakdown is used to identify the faces detected with a high accuracy rate. The matched face is then used to mark presence of the workers. Addition to positive or rejecting leaves and replies for all requests. This product gives much more solutions with correct results in user cooperating manner rather than existing attendance and leave management system.

Key words: Bluetooth, RSSI, proximity estimation model, Smartphone, face to face proximity

I. INTRODUCTION

The accessibility of "dependably on" correspondences has colossal ramifications for how individuals communicate socially. Specifically, sociologists are occupied with the inquiry if such pervasive access expands or abatements up close and personal communications. Not at all like triangulation which looks to exactly characterize position, the subject of eye to eye collaboration decreases to one of nearness, i.e., is the people inside of a certain separation? In addition, the issue of vicinity estimation is entangled by the way that the estimation must be truly exact (1-1.5 m) and can cover a wide assortment of situations. Existing methodologies, for example, GPS and Wi-Fi triangulation are lacking to meet the necessities of precision and adaptability. Conversely, Bluetooth, which is ordinarily accessible on most cell phones, gives a convincing distinct option for nearness estimation. In this paper, we exhibit through trial studies the viability of Bluetooth for this accurate reason. We propose a closeness estimation model to focus the separation taking into account the RSSI approximations of Bluetooth and light sensor information in diverse situations. We display a few certifiable situations and investigate Bluetooth vicinity estimation on Android as for precision and force utilization.

Connections are not restricted to any specific territory and can occur at a wide assortment of areas, running from sitting and talking in a Starbucks coffeehouse to strolling and visiting over a school grounds. As will be investigated later in the paper, for most vis-à-vis connections, the rough separation between people in easy going discussion is inside of 0.5 to 2.5 meters (Section 4 presents observational proof supporting this case.). One of the arrangements would appear to be area construct figuring which depends with respect to area advances, for example, Wi-Fi triangulation, PDA triangulation, GPS, or a blend of each of the three. On the other hand, none of these arrangements are perfect or adequate. In spite of the fact that Wi-Fi triangulation can exhibit a sensible level of precision, its exactness in everything except the most thick Wi-Fi arrangements is deficient, going on the request of 3 to 30 meters. So also, mobile phone triangulation experiences a far more detestable precision. Besides, while Wi-Fi is sensibly pervasive, Wi-Fi tends to by and large be sparser in green spaces, i.e., outside spaces. Outstandingly, GPS experiences both an exactness weakness (5-50 m) and also an absence of practicality inside.

A. Scope

Wi-Fi triangulation/trilateration is awidely used method todo location indoors whileGPS is perhaps the most popularway to do location outdoors. As summarized in both of them have their own advantages and disadvantages. Here we use Wi-Fi and GPS to do the face-to-fac proximity estimation in order to compare the accuracy of them with the Bluetooth method we proposed. Together with the power consumption comparison in, the method of Bluetooth is proved to be an effective and efficient way in both aspects of accuracy and power usage. We collected both network provider location and GPS location data on the phone for the comparison. With the API provided by class Location Manager

II. SYSTEM ARCHITECTURE

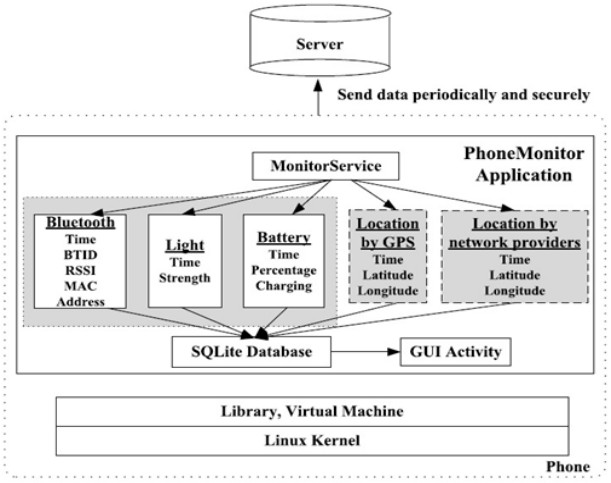

Fig. 1: System Architecture

Phone Monitor: An application named Phone Monitor collects Bluetooth data including the detailed values of RSSI,MAC address, and Bluetooth identifier (BTID). The data is recorded in SD card once the phone detects other Bluetooth devices around. In addition to Bluetooth, data points from a variety of other subsystems (light sensor, battery level and etc.) are gathered in order to compare and improve the proximity estimation. Separate threads are employed to compensate for the variety of speeds at which the respective subsystems offer relevant data.

Bluetooth: We use bluetooth for collect information like RSSI values(it is signal values) ,MAC address of device for unique identification, BTID Bluetooth id i.e. Bluetooth hardware id get and current time for record data. Using RSSI value threshold to determine whether two phones are in proximity or not.

Light Sensor: It is used to get light sensor values to identify the state of device. In order to determine whether the phone is indoors or outdoors, inside the backpack or in hand. we keep track of the light sensor data. By differentiating environments and smoothing data, a face-to-face proximity estimation model is outlined to improve the estimation accuracy in general scenarios

Battery: In battery section we get battery percentage .The battery usage percentage is recorded for the energy consumption comparison. And also get time to keep track of energy consumption. Location by GPS: In this we get location using GPS provider (i.e. Global Positioning System) in format of latitude and longitude . In order to determine whether the phone is sheltered (e.g., inside a backpack or in hand) and the surroundings (e.g., inside or outside buildings) during the daytime.

Location by Network provider: In this we get location using network provider (i.e. either Wi-Fi or cell network) in format of latitude and longitude. In order to determine whether the phone is sheltered (e.g., inside a backpack or in hand) and the surroundings (e.g., inside or outside buildings) during the daytime.

Sqlite Database: We keep the data records in a local SQLite database on the phone it also use to calculate proximity estimation.

Server: It is used for to store records periodically for analysis; We keep the data records in a local SQLite database on the phone and upload them to MySQL database on the servers periodically with AES security for backup and analysis.

GUI Activity: In this user interface for oprate the Phone monitor Application.

III. ALGORITHM

A. *Bluetooth RSSI Versus Distance*

Kotanen et al. presented the strategy and execution of a Bluetooth Local Positioning Application (BLPA) [28] in which the Bluetooth received signal power level is converted to distance estimate according to a simple propagation model as follows:

$$RSSI = P_{TX} + G_{TX} + G_{RX} + 20\log\left(\frac{c}{4\pi f}\right) - 10n\ log\ (d),$$
$$= P_{TX} + G - 40.2 - 10n\log(d), \quad (1)$$

where PTX is the transmit power; GTX and GRX are the antenna gains; G is the total antenna gain: G ¼ GTXþGRX; c is the speed of light (3:0 108 m/s); f is the central frequency (2.44 GHz); n is the reduction factor(2 in free space); and distance between teller and receiver (in m). d is therefore

$$d = 10^{[(P_{TX}-40.2-RSSI+G)/10n]}. \quad (2)$$

However, such a model can only be utilized as a academic location. Due to reflection, obstacles, noise and antenna orientation, the connection between RSSI and distance becomes more complex. Our challenge was to assess how much impact these conservation influences have on Bluetooth RSSI standards. Therefore, we carried out several experiments to understand how the Bluetooth indicators fade with detachment under these environmental effects.

Algorithm 1 Estimate probability p_i of face-to-face proximity with Bluetooth RSSI value x_i and light sensor value y_i

$x_i \leftarrow a * x_{i-1} + b * x_i + c * x_{i+1}$
determine the scenario depending on y_i
if x_i *is in positive zone* **then**
  $p_i \leftarrow 1$
else if x_i *is in probability zone* $[B_{min}, B_{max})$ **then**
  $p_i \leftarrow (x_i - B_{min})/B_{range}$
else
  $p_i \leftarrow 0$
end if

IV. RESULT

Fig. 2: Welcome Screen or Flash Screen

Fig. 4: Wifi on-off

Fig. 5: Settings for set IP to communicate with local server or laptop

Fig. 6: Set IP

Fig. 7: Registration Activity

Fig. 8: Login page

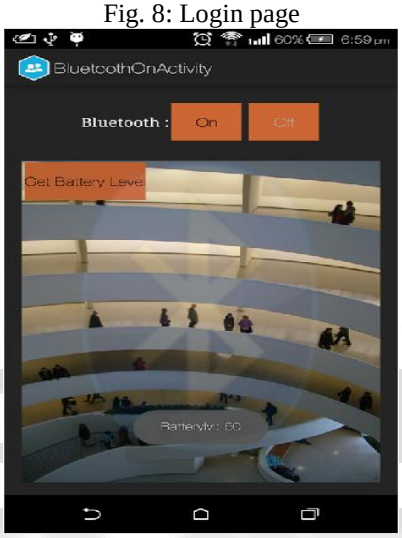

Fig. 9: Bluetooth on-off activity

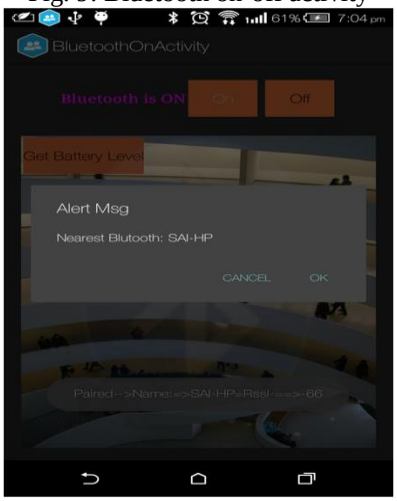

Fig. 10: Display Alert Msg

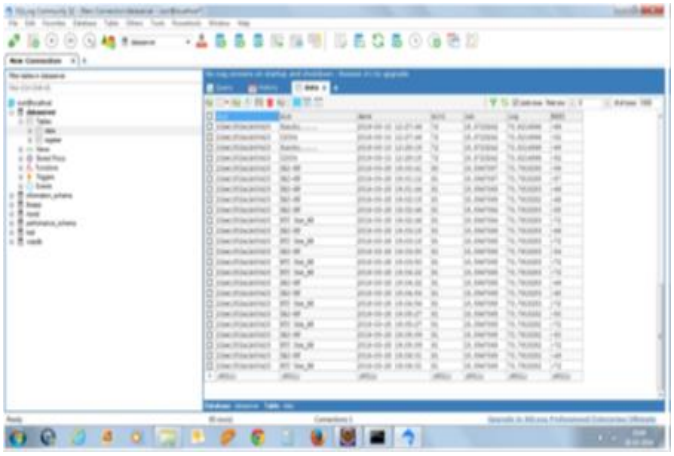

Fig. 11: Mysql Database

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V. CONCLUSION

In synopsis, our exhibited work accepts the utilization of Bluetooth as an instrument for up close and personal nearness recognition. We painstakingly investigated the relationship between Bluetooth RSSI values and separations for inside and outside settings. We likewise examined the effects of distinctive environment settings. Taking into account the test results, we condensed two strategies to gauge vicinity: single limit and various edges. In the last approach we demonstrated how the light sensor and smoothing can be utilized to yield sensible close estimations for closeness. At that point we proposed the closeness estimation model by joining Bluetooth RSSI worth, light sensor information and in addition information smoothing together. By creating and conveying the application "PhoneMonitor" on 196 telephones, we recorded information reported from gadgets in diverse events. We connected the closeness estimation model on the reasonable information and dissected the closeness among the members and in addition the symmetry of nearness. Contrasted and the system for gathering all gadgets around, the exactness of using vicinity estimation model to gauge whether two gadgets are in an immediate correspondence separation is enhanced drastically. We too looked at the battery utilization and precision of our strategy with other distinctive area systems, for example, Wi-Fi triangulation and GPS. The outcomes shows that Bluetooth offers a compelling instrument that is exact and power efficient for measuring up close and personal vicinity.

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