A Project Report

On

GPS BASED HUMAN TRACKING

requirement for the award of the degree of

Bachelor of Technology in Computer Science and Engineering

Under The Supervision of Ms.
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SCHOOL OF COMPUTING SCIENCE AND ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

GALGOTIAS UNIVERSITY, GREATER NOIDA, INDIA DECEMBER - 2021

SCHOOL OF COMPUTING SCIENCE AND ENGINEERING
GALGOTIAS UNIVERSITY, GREATER NOIDA

CANDIDATE'S DECLARATION

I/We hereby certify that the work which is being presented in the project, entitled **"GPS BASED HUMAN TRACKING"** in partial fulfillment of the requirements for the award of the **BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE AND ENGINEERING** submitted in the **School of Computing Science and Engineering** of Galgotias University, Greater Noida, is an original work carried out during the period of **JULY-2021 to DECEMBER-2021**, under the supervision of Mr. INDRA KUMARI, Assistant Professor, Department of Computer Science and Engineering**,** Galgotias University, Greater Noida

The matter presented in the project has not been submitted by me/us for the award of any other degree of this or any other places.

19SCSE1010603 – SAUMAY PATHAK

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This is to certify that the above statement made by the candidates is correct to the best of my knowledge.

Supervisor

(Ms. Indra Kumari,

Assistant Professor)

CERTIFICATE

The Final Thesis/Project/ Dissertation Viva-Voce examination of **19SCSE1010603 – SAUMAY PATHAK, 19SCSE1010031 – BITTU KUMAR** has been held on _____and his/her work is recommended for the award of **BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE AND ENGINEERING**.

Signature of Examiner(s) **Signature of Supervisor(s)**

Signature of Project Coordinator **Signature of Dean**

Date:

Place:

ACKNOWLEDGEMENT

It is our privilege to express our sincerest regards to our Project Coordinator **Mr. V ARUL**, Assistant Professor, for their valuable inputs, able guidance, encouragement, whole-hearted cooperation and constructive criticism throughout the duration of our project.

We deeply express our sincere thanks to our Head of Department for encouraging and allowing us to present the project on the topic "**GPS BASED HUMAN TRACKING**" at our department SCSE for the partial fulfillment of the requirements leading to the award of B-Tech degree.

We pay our respects and love to our parents and all other family members and friends for their love and encouragement throughout our career. Last but not the least we express our thanks to our friends for their cooperation and support.

ABSTRACT

There is one central PC to which we connect a mobile using serial or USB port through F bus or DATA cable. The person to whom we wish to track via mobile, his mobile must be GPS enabled & J2ME based. When user clicks on a search button the SMS is automatically sent to GPS mobile & automatic feedback will sent by GPS mobile. And that will be caught by central pc in which we get the longitude & latitude of that area. This type of SMS's are sent frequently to that person's mobile from the mobile which is connected to the central PC. Such SMS are frequently sent and the feedback gets us the current time, date, longitude & latitude which gets stored in database. All this database info goes into the java script which computes the position of the person by longitude & latitude axis point in the Google map.

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CHAPTER 1

INDRODUCTION

In this technological understanding, the extent of working ladies have accelerated significantly and the prefer for protection has moreover extended long gone up. We have confidence that this questioning would be a boon to it. The monitoring device would possibly additionally addition pick to advisable aid the safety of female and even bodily challenged people. At contemporary all the cell telephones are tracked on their place for the length of emergency by the usage of workable of their sim card network or IMEI range.

Tracking with the useful resource of way of these methods will now no longer be unique as the nearby given via the usage of these science is now no longer accurate. This science makes use of LTE for signaling factors as this is no longer the necessary performance of this technological expertise the neighborhood grant is no longer accurate.

This is an android software that gives a range alternative commonly in particular based on the user's location. It lets in the clients to set region reminders, bookmark exceptional areas and provide mapping facility to these locations. Moreover, it moreover approves the users to search for close by locations and bookmark them5.

Bookmarking locations, supplying mapping services and searching close by way of areas are greater like the aspects that are already on hand in Google Maps. The vicinity reminder turns out to be an overhead in cases when the man or woman is no longer actually in the place for the purpose referred to in the reminder.

In this era, the number of working women have increased drastically and the need for safety has also gone up. We believe that this proposal would be a boon to it. The tracking system could aid the safety of women and even physically challenged people. At present all the mobile phones are tracked on their location during emergency by their sim card network or IMEI number.

Tracking by these methods will not be precise as the location given by these Technology is not accurate. This Technology uses LTE for signaling purposes as this is not the basic functionality of this technology the location give is not accurate. In this proposed application, the location of the user is tracked using

Global Positioning System (GPS). The main functionality of this technology is to provide location information Using a mobile application, we are broadcasting the user's locations to preferred contacts selected by the user, at regular time intervals by this process we can ensure that the user is going on track in his travel.

If the user halts for a longer period of time or deviates from the path of travel it can be instantly found using the SMT System.

Safety at all times has been a threat to mankind. In the recent times, smart phone have become essential for humans. Mobile tracking is done by network signal. Most widely used signal system for mobile tracking is LTE.

The LTE system is poor in location tracking as it is not the basic functionality of the system. Global Positioning system is the technology that is used to location purposes.

We have proposed a mobile application to address the safety threat to people during travel. Our proposed model is Smart Mobility Tracker and it tracks the user location using GPS and informs the same to their preferred contacts multiple times depending on the travelling distance.

The desired contacts are cautioned with a high priority alert when the user is found to go off course the desired route. A secondary GPS device locates the user during unprecedented situations. Battery consumption can be minimized by activating GPS only when alert has to be sent.

CHAPTER 2

LITERATURE SURVEY

A literature review is a **GPS BASED HUMAN TRACKING** research on the topic.

TITLE : - Cost Effective GPS-GPRS Based Object Tracking System

We Proposes and implements a low cost object tracking system using GPS and GPRS. The system allows a user to view the present and the past positions recorded of a target object on Google Map through the internet. The system reads the current position of the object using GPS, the data is sent via GPRS service from the GSM network towards a web server using the POST method of the HTTP protocol. The object s position data is then stored in the database for live and past tracking. A web application is developed using PHP, JavaScript, Ajax and MySQL with the Google Map embedded. The existing live tracking systems that are available now a days use SMS for the communication to the server which turned out to be expensive. (SMS are used for communication to device). We have used the GPRS service which made our system a low cost tracking solution for localizing an object position and status. This system is very useful for car theft situations (alarm alert, engine starting, localizing), for adolescent drivers being watched and monitored by parents (speed limit exceeding, leaving a specific area), as well as for human and pet tracking. Index Terms GPS, GPRS, GSM, NMEA, IMEI, Google Map, Latitude, Longitude, Ajax, XML, HTTP, TCP, MySQL, Car tracking, Car monitoring.

There is one central PC to which we connect a mobile using serial or USB port through F bus or DATA cable. The person to whom we wish to track via mobile, his mobile must be GPS enabled & J2ME based. When user clicks on a search button the SMS is automatically sent to GPS mobile & automatic feedback will sent by GPS mobile. And that will be caught by central pc in which we get the longitude & latitude of that area.

This type of SMS's are sent frequently to that person's mobile from the mobile which is connected to the central PC. Such sms's are frequently sent and the feedback gets us the current time, date, longitude & latitude which gets stored in database. All this database info goes into the java script which computes the position of the person by longitude & latitude axis point in the Google map.

TITLE:- Design and Implementation of a GPS based Personal Tracking System.

Tracking based applications have been quite popular in recent times. Most of them have been limited to commercial applications such as vehicular tracking (e.g. tracking of a train etc.). However, not much work has been done towards design of a personal tracking system. Our Research work is an attempt to design such personal tracking system.

In this paper, we have shared glimpses of our research work. The objective of our research project is to design &develop a system which is capable of tracking and monitoring a person, object or any other asset of importance (called as target). The system uses GPS to determine the exact position of the target.

The target is aided with a compact handheld device which consists of a GPS receiver and GSM modem. GPS receiver obtains location coordinates (viz. Latitude & Longitude) from GPS satellites. The location information in NMEA format is decoded, formatted and sent o control station, through a GSM modem. Due to use of Open CPU development platform, no external Microcontroller is required, with additional advantage of compact size product, reduced design & development time and reduced cost.

GPS devices have been used by TU Delft to track people in several experiments. The experiments, of which we describe two here, had different research aims and took place on different scales. In the first experiment described in this paper, GPS devices were deployed in the INTERREG IIIB Spatial Metro project to observe pedestrians visiting the historic city center of Norwich (U.K.), Rouen (France) and Koblenz (Germany) . In the second experiment described below, the technology was used to track the activity patterns of families in Almere (The Netherlands).
In both cases the collection of spatial-temporal data took one whole week and was accompanied by a questionnaire, although there were some important differences in set-up of the field work. The details of both experiments' set up are explained below.

The GPS-experiments described in this paper were set up to tackle questions about urban quality in the field of urbanism, i.e. the design and planning of urban areas. However, the application of data from GPS experiments in urbanism is not a matter of course. The expert meeting 'Urbanism on Track in 2007 showed that GPS does not automatically bridge what can be called the *applicability gap* between empirical studies on behavior and the making of an urban design lists the following potential problems, amounting to the *applicability gap*: (a) the tendency to collect more knowledge on restricted parts of situations, burdening the synthesis capacities of designers,(b)knowledge generated through empirical research not being geared towards the information need of designers – for example empirical researchers tending to communicate verbally, while designers tend to communicate visually, and (c)designers not formulating synthesis-oriented research questions for spatial scientists.

Despite these limitations, GPS is an interesting new instrument to map and measure urban quality in new ways. The particular cases in this paper refer to different types of urban quality that can be studied using GPS. Spatial Metro is a research program which focuses on urban qualify from the perspective of pedestrians. The aim of the program is to find new and exciting ways of improving city centers for pedestrians.

GPS was used as an instrument to analyses both individual routes (so called trajectories or tracks) and collective, aggregate patterns of use. In addition to the Spatial Metro program, TU Delft carries out research on new towns, i.e cities, towns, or communities that were carefully planned from its inception and are typically constructed in a previously undeveloped area.

CHAPTER 3

SYSTEM ANALYSIS

3.1 PROPOSED SYSTEM -

A human tracking system for tracking a plurality of humans in motion, in a video of the humans in motion, includes a human detection subsystem, and a combined tracker. The human detection subsystem is configured to generate a detection output by detecting the plurality of humans in a part-based representation, in each one of a sequence of static frames in the video.

The human detection subsystem is further configured to account for partial occlusion of one or more of the humans in the image. The combined tracker is configured to receive. The work aims in tracking a user during his travel. Mobile device has become a vital utility of an individual. Tracking of mobile devices are usually done by tacking the network range under which it is traveling, but this process is less efficient as its accuracy of location is poor.

The system proposed uses GPS technology for tracking the mobile device. The accuracy of GPS is very high compared to the other techniques. The user feeds the start and end points of his journey to the application, based on which the locations are marked and a route is displayed. The user starts the journey and then the location the user is sent to the SMT (Smart Mobile Tracker) server in regular intervals with respect to the distance between the source and destination. This information is notified to a set of preferred contacts selected by the user.

The path traveled by the user, is monitored by the SMT server, any change in course the server notifies the set of preferred contacts with a alert message with a higher priority. In order to preserve battery life the GPS is accessed only when the current location is needed that is the GPS is toggled frequently to avoid excessive battery consumption. An external GPS device is synchronized with the smart phone application, which is used during untoward conditions like when the mobile phone runs out of charge or when the mobile phone is been misplaced. When the external device is running the location of the user is constantly notified to the preferred contacts.

The system consists of mobile phone, SMT server and an external GPS device. The mobile phone consists of an in-built Global Positioning System and the SMT android application. The user gives the basic details for the application registration. The source and destination is given as input to the SMT application. The application displays a route from the source and destination.

The SMT application sends the current location of the user to the SMT server in regular intervals. The SMT server consists of a location tracker, path tracker and a notifier to send notifications to the preferred contacts. These are the key operational threads that constantly run in SMT server. The location tracker receives the location information from the SMT application and forwards to the notifier. The Path tracker checks whether the user is on course.

3.2 Location-based surveillance-

(a)Tracking people

Mobility is a basic and indispensable human activity that is essential for us to be able to lead independent lives on a daily basis". Someone who is moving can be tracked manually or digitally. The information being gathered as the end-user moves around can be considered a type of "electronic chronicle".

To allow oneself to be tracked can be a voluntary act, but in most case it is imposed by a third party who has some control over the end-user. Tracking is critical in the process "of people motion capture, people behavior control and indoor video surveillance".
In this paper we do not consider location information gathered using indoor tracking techniques such as knowledge representation or models of temporal correlation, although these techniques could be complementary to outdoor GPS tracking. There are also other techniques for tracking humans based on Assisted GPS (A-GPS) Wi-Fi technology such as the 'Human Tracking and Following' system or embedded technologies [71 which all may become used in the future as a replacement or contingency technique to GPS.

The Wi-Fi tracking approach employs an obtrusive technique requiring the end-user to employ active beacons on their body, as opposed to vision systems which are generally unobtrusive. In like manner, a GPS receiver in the form of a watch or handheld device clipped to a belt can be considered obtrusive.

(b)Storing tracking data

Tracking data gathered by a GPS, such as route or point information, can be spatially represented in a geographic information system (GIS). The GIS model contain multiple layers of information, from cvi data to administrative political data, statistical information and even non-earth unit data. The GIS can store trajectory data that is based on assumptions related to the end-user's historical speed and direction data, and static road/path segment information.

Related to this idea is the notion of "digital trail libraries", in effect the study of overlapping GPS trails and their digital storage [91. Morris et al. explain that GPS track logs, are sequences of precise locations created by dropping a breadcrumb. While Morris' paper focuses on GPS for recreational activity, there is the potential for "private" track logs to be compared in order to find originating and terminating points of interaction between people.

The outcomes of such an analysis fall into the category of location-based intelligence. Consider the potential for "collision" alerts of persons of interest. Access to the tracking data of an end-user's records requires strict policing. Henger and Steen (2005) reaffirm that "Location is a sensitive piece of information" and that "releasing it to random entities might pose security and privacy risks" [101. They emphasize the need for individual and institutional policies and the importance of formal models of trust.

3.3 WORKING REFRENCE

(a) Related Work-

This paper proposes a system that focuses on place characterization rather than bare latitude and longitude values, based on the data recorded continuously by smart phone. This data is collected using GPS and annotated by the user before being recorded. This recorded data is used for automated place labeling without using geographical information. The feedback system involved in this model is cumbersome and results in analysis of meticulously collected data.

The proposed system involves many logistical difficulties that makes the implementation tedious. This model concerns about the safety of children. It uses a technique called geo fencing where the parents mark a virtual boundary. When the children cross this boundary an alert in the form of short message is issued to the parents. It uses Google maps API to show thelocation2.However, in this system the action of geo fencing can only be done by a parent, thus depriving individuals of making geo fences of their own. This system is not suitable for many other demographics that wish to set their geographical region as well.

This system uses a technique called fleet super vision system which monitors commercial vehicles' on -road evolution. It fixes tracking locations based on time window constraints. When the vehicles cross this tracking location an automatic dispatch of information from the localization system of the vehicle is made. This information helps to compute the time-delay much earlier and also

take any preventive measures ifpossible3. The major setback of this proposed model is that it requires an additional hardware that contains the vehicle's unique information, to be attached to the vehicle.

This is a mobile application which provides location based services. It uses GPS and helps the user in locating nearby family members and receive alerts about friends. The proposed model mainly focusses on locating people nearby and sending alerts to the user. However, it is not so efficient as the application has a very poor range of sensing of just about a couple of meters.

This is an android application that provides various services based on the user's location. It enables the users to set location reminders, bookmark certain locations and provide mapping facility to those locations. Moreover, it also allows the users to search for nearby places and bookmark them. Bookmarking locations, providing mapping facilities and searching nearby places are more like the features that are already available in Google Maps. The location reminder turns out to be an overhead in cases when the user is not actually in the location for the purpose mentioned in the reminder.

This paper exhibits an adaptive duty-cycling scheme called Smart DC to provide contextual information on user's mobility based on mobility- prediction. It makes use of unsupervised mobility learner, adaptive duty cycling based on Markov decision process and a mobility predictor. This model predicts the visiting places based on the previously tracked mobility of the user.

A self-contained unit that can monitor its own location is represented in this paper. It comprises of a tracking unit, which runs on an Atmel AVR architecture and was implemented using C programming language while the central logging of locations and exporting them to Google Maps and Google Earth is done with the help of a PHP application.

This is a location Based system that makes the user's mobile phone to provide a few Context Based services such as tracking location of user and auto switching mobile phone profiles and setting location-specific reminders.

(b)EXISTING WORK-

The senior tracker application aims in tracking people on the basis of the location provided by the user with the help of GPS. The capabilities of mobile devices have improved a lot and it has also become a mode of entertainment which has

eventually made it an essential device in the recent times. The application notifies about people who have lost track to their friends and family. The application can send message to any number of preferred contacts selected by the user. As data is needed to be stored locally SQLite is been used for database. Four tables are used in this application, each for recent location, usual location, contact list and gesture table.

The recent table holds the current location information of the user this table is updated constantly, the usual location table holds the location frequently visited by the user this information is given by the user to the application, the contact list table holds the list of preferred contacts selected by the user and the gesture table holds a set of predefined gestures.

The application uses google maps activity to track the location of the user. The usual location are selected by the user, a radius of 200 m around the point is marked. The recent location is taken from the recent location table and is checked whether it is within the radius.

This is calculated by a formula called **Haversine,** where, if the distance between the recent location and usual location is greater than the marked radius if the user away from the usual Location then an information is sent in the form of short message to the preferred contacts. The major drawbacks of the project is that, as the recent location is constantly updating the GPS must be **'on'** constantly which draws a lot of battery and as all the messages are been sent from the mobile itself so it is not reliable.

(c)Methodology-

For example, GPS-enabled smartphones are typically accurate to within a 4.9 m (16 ft.) radius under open sky (view source at ION.org). However, their accuracy worsens near buildings, bridges, and trees. High-end users boost GPS accuracy with dual-frequency receivers and/or augmentation systems.

One way to deduce some of the unforeseen consequences of GPS-based human tracking is to experience the process first hand. In this pilot study, a civilian participant tracked themselves for a period of 2 weeks using a GPS 24/7. Participant observation is where the observer "seeks to become some kind of member of the observed group" [Il]. For the purposes of this study the participant represents individuals who would have their movements tracked and monitored by a third party Measures need to be taken to ensure the participant's normal activities are not impacted in any way by carrying the GPS.

One way to deduce some of the unforeseen consequences of GPS-based human tracking is to experience the process first hand. In this pilot study, a civilian participant tracked themselves for a period of 2 weeks using a GPS 24/7. Participant observation is where the observer "seeks to become some kind of member of the observed group" [Il]. For the purposes of this study the participant represents individuals who would have their movements tracked and monitored by a third party Measures need to be taken to ensure the participant's normal activities are not impacted in any way by carrying the GPS.

3.4 SET UP-

The following guidelines were used in the pilot

Daily activities - At the start of each day the GPS device is turned on as soon as the participant leaves their place of residence. At the end of each day the device is switched off.

Carrying the GPS device — the device is carried in the participant's bag or pocket while walking. When driving, the device is placed securely in a dock.

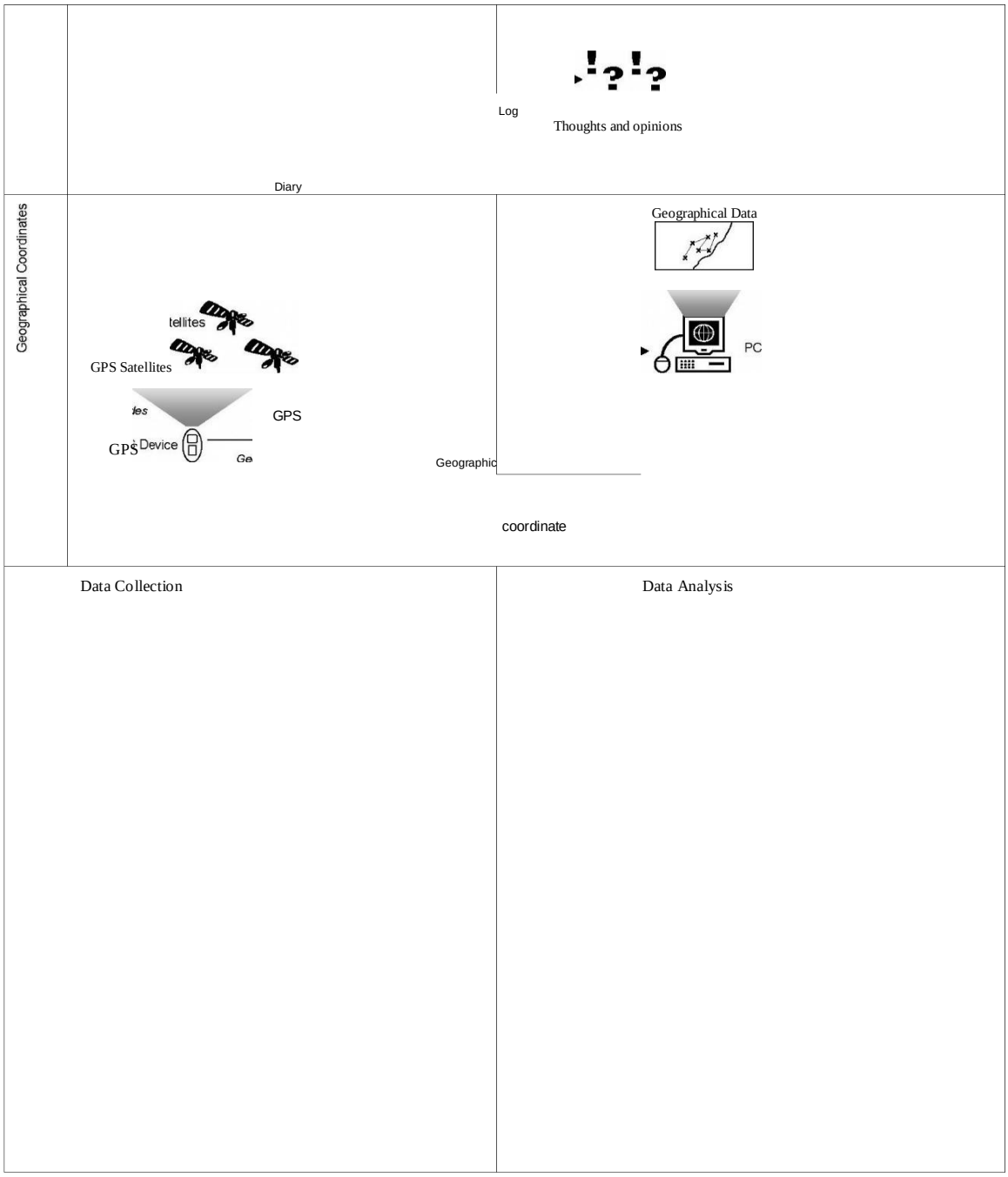
Tracking node limitation — the device is only capable of collecting 2000 tracking nodes at a time. While this is more than enough for a single day of tracking it is not enough for more than one day. Care must be taken to ensure that track data is erased at the end of each day so there will be enough memory the following day.

Getting a signal — it takes about one minute to get a signal, so when the device is first turned on the user will have to wait until a signal is detected.

Indoors — the device looses its signal when indoors so when the signal is lost at a certain location it will be assumed that the user is indoors.

Battery life — the manual indicates that the device can get up to 14 hours of usage on two AA batteries. Rechargeable batteries do not have enough power to keep the GPS device running throughout an entire day. Non-rechargeable batteries will be replaced when they are running low.

1.Figure - Observational Instruments



CHAPTER 4

Observational Study

4.1 (a)Digital Breadcrumb-

An observational study was carried out to gain knowledge about the sensitivity of location information. This study involved a civilian participant who had their daily movements tracked from Monday 15th August 2()05 to Sunday 28th August 2005. The participant is a 21year old university student who works part-time and owns a vehicle. Each day during the two weeks of the study the participant carried a Magellan Meridian Gold handheld device either in a carry bag or pocket (see figure l). The GPS device was setup to collect location data every three seconds. At the end of each day this data was uploaded into GIS software "Discover AUS Streets & Tracks" which was used to save and analyze the data. Throughout the entire study the observer stayed in the area of Will on, NSW, Australia.

Figure 2. -Participant with Magellan GPS Device

A great deal of information was found out about the observer by tracking them over an extended period of time. From data coordinates it is easy to deduce information such as where the participant is located at a given point in time and the speed at which they are traveling. However, more invasive personal data, such as where the participant lives, his workplace and social activities can also be found. It is also possible to create detailed profiles about the participant based on his daily travel routines. For instance, the speed at which the participant is traveling can indicate the form of transport they are using. How long they spend at a location can determine the type of activities the participant is also engaged in.

Figure-shows the participant's movements on day 10 of the study (24th August 2005). On this day the participant traveled from their home to the University of Wollongong, and then to their place of work. This day is typical

of other weekdays in the study as the most common locations traveled were to the participant's home, University and workplace. The user's daily track movements are indicated by the thicker lines (two closed loops connected by a highway). With the GIS software it is possible to play the participant's movements in real time, to get a step-by-step and magnified view of their whereabouts. Roads, highways, train tracks and trails are clearly presented in the map. Key locations, street names and suburb names are also shown on the map. Even more data could be gathered manually or purchased to overlay onto the current details. It would be interesting also to show intersecting trails of other members of the family during the same study period. Different types of "families" or "groups" would have different types of profiles, some lending themselves to greater location movement than others, with communities-of-interest (Col) varying widely from local, national and international travel.

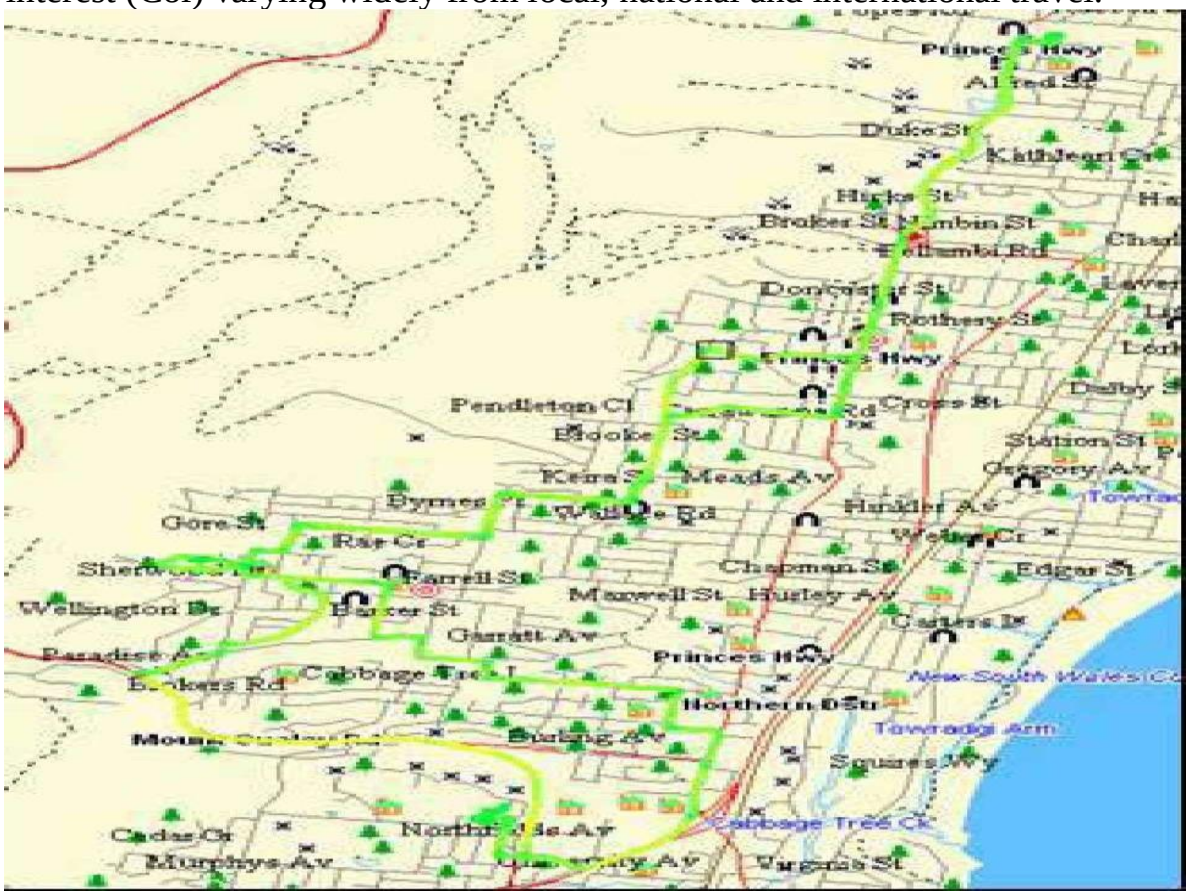


Figure 3. — Participant Track Data for the Study Period

4.1 (b) Graphical travel logs

Graphical analysis of track data also gives indications of a person's travel habits and behavior, providing that all the data is accurate and free from errors. The following graphs (figures 3-6) are meaningful representations of speed, time, distance, and elevation data collected by the GPS.

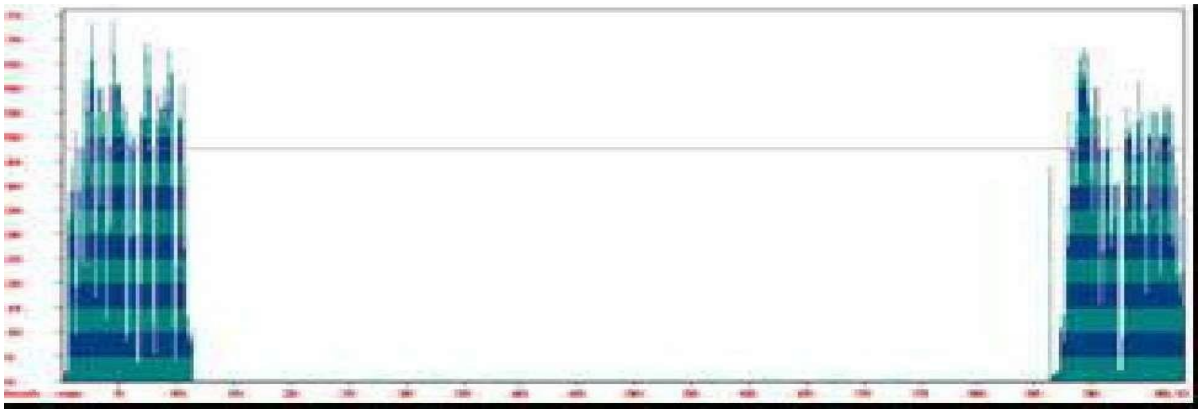


Figure 4.1 Time/Speed Graph: indicates speed at a specific time, when a person is traveling from one place to another, and how long the person spends at a given location.

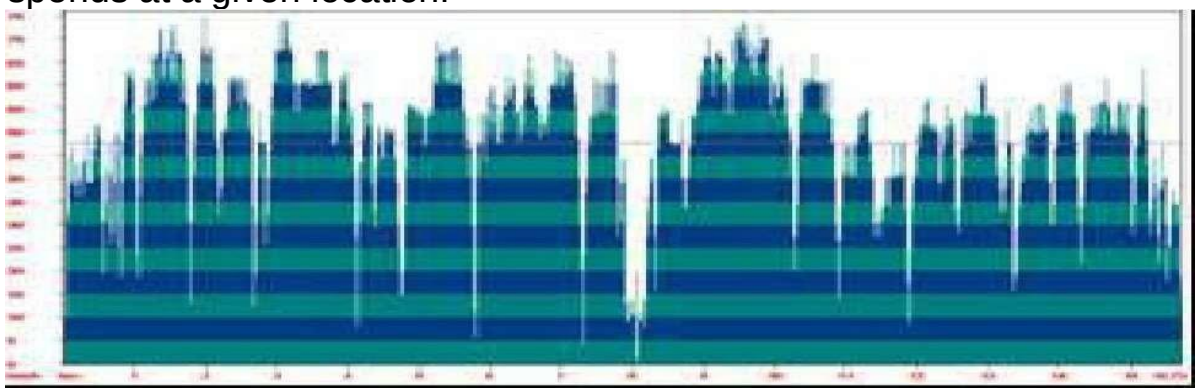


Figure 4.2:- Distance/Speed Graph indicates speed at a specific point in a journey, and whether a person is in a vehicle or walking (i.e. form of transport).

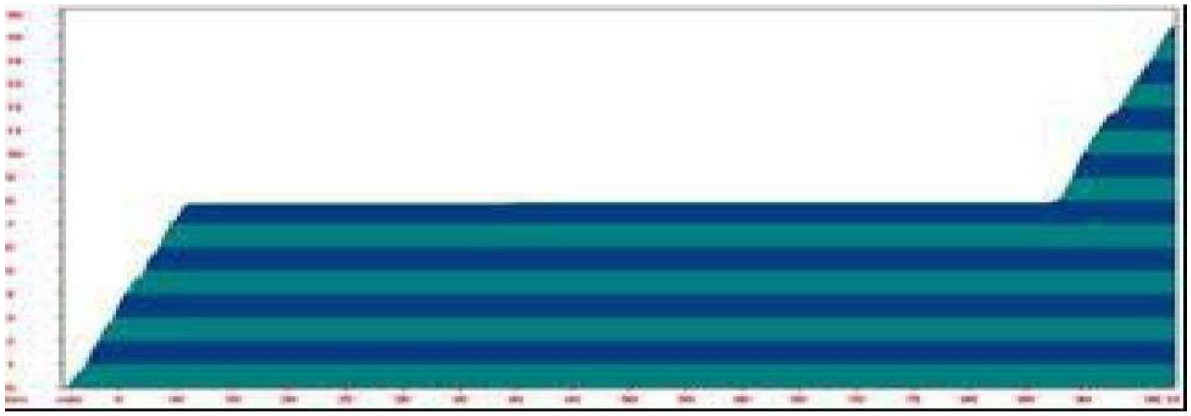


Figure 4.3:- Time/Distance Graph indicates the length of time a person stays at a location, the length of time a person is on the move, and the number of places a person travels to.

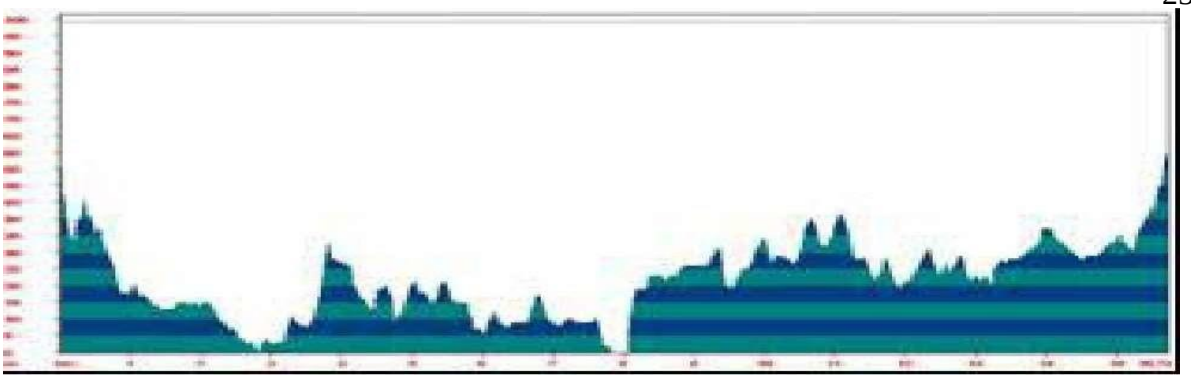


Figure 4.4:- Distance/Elevation Graph indicates a person's location by comparing the elevation patterns with other data.

4.2 GPS tracking issues-

Accuracy- Although not perfect in terms of accuracy of a given location fix, the GPS is generally perceived by civilians as being close to perfect. However, on several occasions in the observational study substantial errors occurred. Over the two weeks of the observational study there were six significant signal dropouts. During a signal dropout a person's location is not known.

All of these dropouts occurred while the participant was traveling by car. It is likely that the GPS receiver was not positioned well enough to gain an accurate signal or traditional natural/physical factors affected the device. This kind of signal dropout could be costly in a real life scenario if a person's location was mandatory. There were also five significant speed miscalculations during the study. Speed is found by calculating the distance traveled between two points within a given time period.

For example, on day 13 of the observational study the tracking information indicated a speed of 600 km/h whilst in a moving vehicle. This was found by calculating the time and location differences between two subsequent tracking points. The collected GPS data indicated the participant had traveled 0.0479884332997 kilo meter in 5 seconds.

4.3 Editing track data-

The GPS device used to collect location data stored tracking nodes which recorded location and time data every 3 seconds. GIS software was then used to

create an entire track by joining each tracking node. However, the software also grants the user the option to add and edit tracking nodes. This feature is included to assist in navigation but could be used for other covert reasons. The use of GPS location data is surprisingly considered legitimate evidence in legal trials [121. It is possible to convict an innocent man of a crime they did not commit by editing track data to falsify evidence. Stringent security and validation checks need to be set in place if authorities plan to use GPS track data as valid evidence in a court trial.

4.4 User travel behavior-

An analysis of the track data has shown that the participants' daily movements are quite similar each week (compare figures 7 and 8, 9 and 10) and is a reflection of their daily routines and behavior. The observer took the exact same travel route whenever they traveled to a known location, like home or work, even though there are alternate routes- reflecting how habitual some humans are. The track data also reflects the participant's behavior when they are running late for a meeting or deadline (i.e. the participant accelerated their speed while walking/driving). This kind of information can be used to create intelligent systems which can observe what a person is doing and then alert systems when their behavior is out of the ordinary.

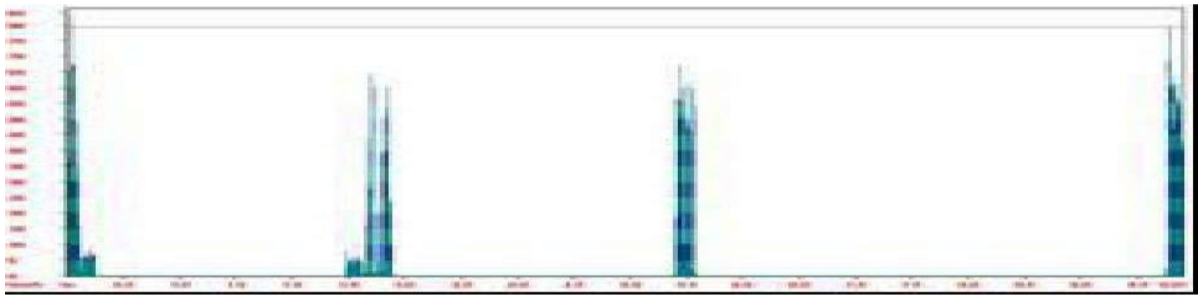


Figure 5.1: Time/Speed Graph

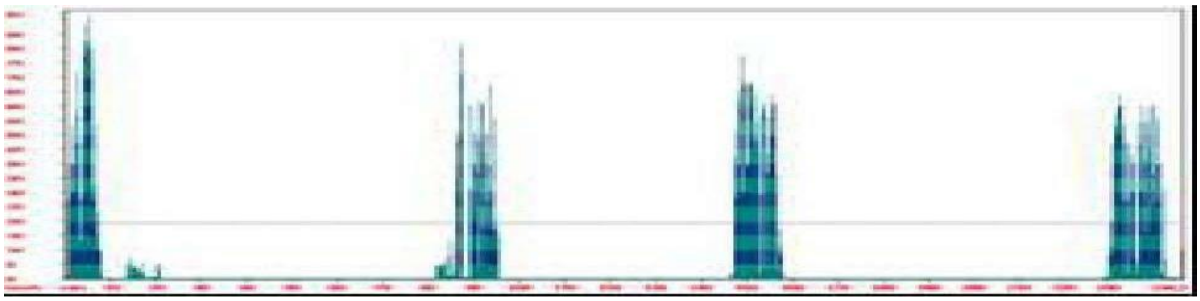


Figure 5.2: Time/Speed Graph

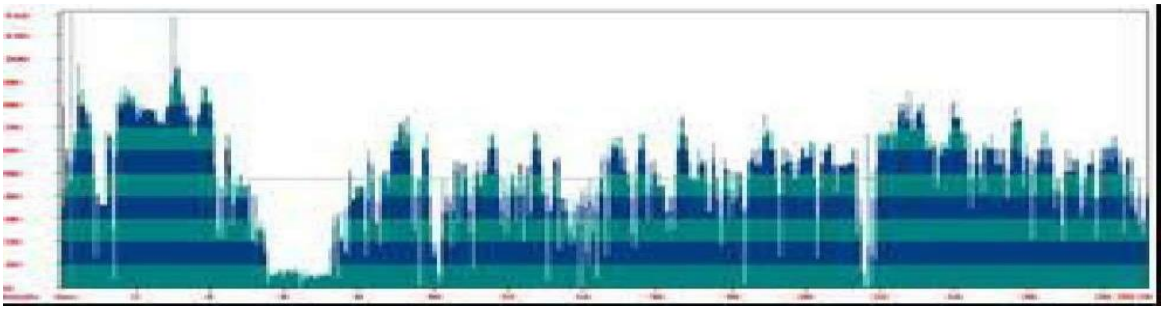


Figure 5.3: Distance/Speed Graph

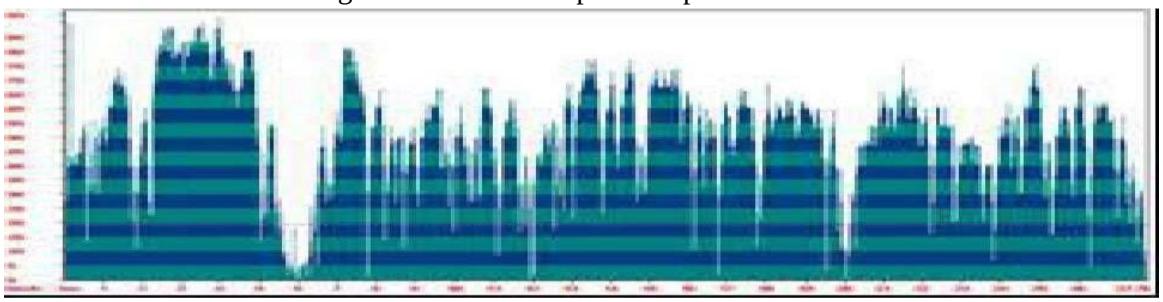


Figure 5.3: Distance/Speed Graph

Substantial similarities can be seen between like graphs, one week to the next. Both sets of time/speed graphs indicate the participant traveled on four occasions during the same day of the week, in consecutive weeks. The distance/speed graph shows similar patterns of traveling speed. In fact, the graphs of every single weekday were almost identical one week to the next, typical of a university student pattern of behavior. The weekends did not vary that much either- an opportunity to go to work, take a break.

4.5 Detail of GIS-

The GIS software used, provided details on the roads, highways and the location of major landmarks but did not show any building data. There are however, databases like MapInfo's Map Marker or the Australian Geographical National Address File (G-NAF) that could be coupled with a telemarketing list to provide a rich background layer. In this project, little could be deduced from the user's location at certain longitude and latitude coordinates (apart from what the user provided) because the supporting database was absent. The level of detail in a GIS could be made scalable to correspond with its application context. In applications which require high resolution detail, the GIS could be setup to display roads, buildings and landmarks. Conversely, if little detail is needed it could show the user's location in relation to important landmarks.

CHAPTER 5
User awareness

Several days into the study the user indicated that it was easy to forget about the fact they were being tracked or observed (see section 6). Any activity that is carried out at length could easily become routine. By the end of the study the user was not concerned about being tracked but was more concerned about having to carry the device around. If GPS were to be enforced on parolees as a deterrent to crime, the participant felt it might lose effectiveness as a tool in the longer term.

5 (a) Outcomes of the observational pilot study

This pilot study provided a practical perspective to the process of GPS tracking and proved that it can be accomplished with relative ease. The evidence suggests that tracking a person over an extended period of time is an invasion of privacy as GPS applications can track every detail of a person's movements.

The probability of inaccuracies and the possibility of editing data poses questions about the reliability of such information. The effectiveness of GPS tracking in deterring crime may not be as great as first thought because the user may become blasé about its presence.

5 (b) Towards uberveillance

Dataveillance is defined as the "systematic use of personal data systems in the investigation or monitoring of the actions of one or more persons" [131. M. G. Michael [141 has spoken of an emerging- above and beyond almost omnipresent 24/7 surveillance.

The problem, he has gone on to say, is that in human terms at least, "omnipresence will not always equate with omniscience, hence the real concern for misinformation, misinterpretation, and information on manipulation." In the case of the civilian participant observed in this study we cannot assume everything based on his/her location.

Being located in the bounds of the "home" does not mean that the participant has gone to sleep or is inactive; while he/she is at "university" it does not mean they are studying or in class; going to "work" (which happens to be a gymnasium) does not mean the civilian is working out; visiting the location of the does not mean the civilian was drinking anything but cola; a "signal dropout" does not presume the civilian did not take a detour from their normal

route; and a "speed miscalculation" does not necessarily mean the civilian was not speeding, they may have been in an alternate mode of transportation like an airplane, train or speedboat.

Thus while location can be revealing, it can also be misleading. It is important that end-users of location Based services, save for law enforcement, be able to "opt-out" of being tracked, rendering themselves ‚untraceable" for whatever reason.

Being untraceable does not mean that one is doing something wrong, it is one's right to be 'left alone" and LBS policies need to ensure these safeguards arc built in to their applications. Being tracked by multiple "live" devices will also become an issue for the future. What is the true location of a person who is tracked by more than one device- the notion of moving and stationary association confidences is important.

CHAPTER 6

Architecture Diagrams

THE ENHANCEMENT OF GPS TECHNOLOGY ENABLES THE USE OF GPS DEVICES NOT ONLY AS NAVIGATION AND ORIENTATION TOOLS, BUT ALSO AS INSTRUMENTS USED TO CAPTURE TRAVELLED ROUTES.

Figure 6.

6.1 Explanation of Architecture-

As sensors that measure activity on a city scale or the regional scale. TU Delft developed a process and database architecture for collecting data on pedestrian movement in three European city centers, Norwich, Rouen and Koblenz, and in another experiment for collecting activity data of 13 families in Almere (The Netherlands) for one week. The question posed in this paper is: what is the value of GPS as 'sensor technology' measuring activities of people?

The conclusion is that GPS offers a widely useable instrument to collect invaluable spatial-temporal data on different scales and in different settings adding new layers of knowledge to urban studies, but the use of GPS-technology

and deployment of GPS-devices still offers significant challenges for future research.

Figure 7:- Proposed system Model

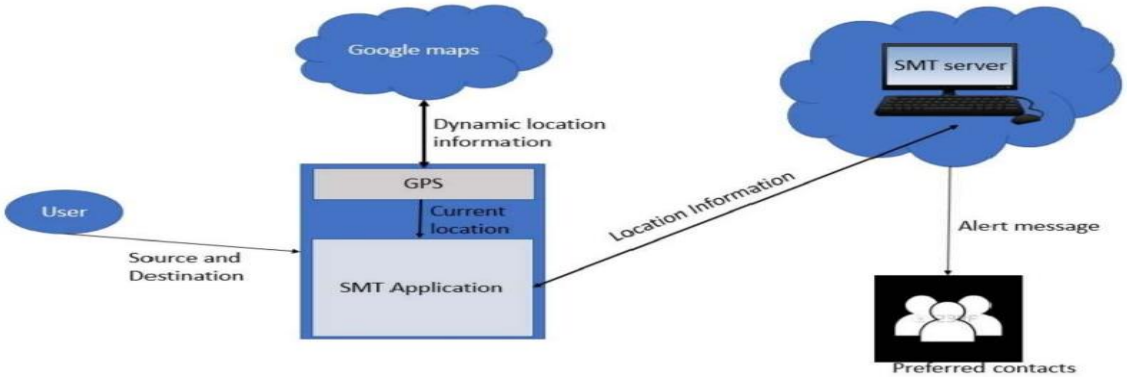


Figure 8. Tracking Object using help of Satellite

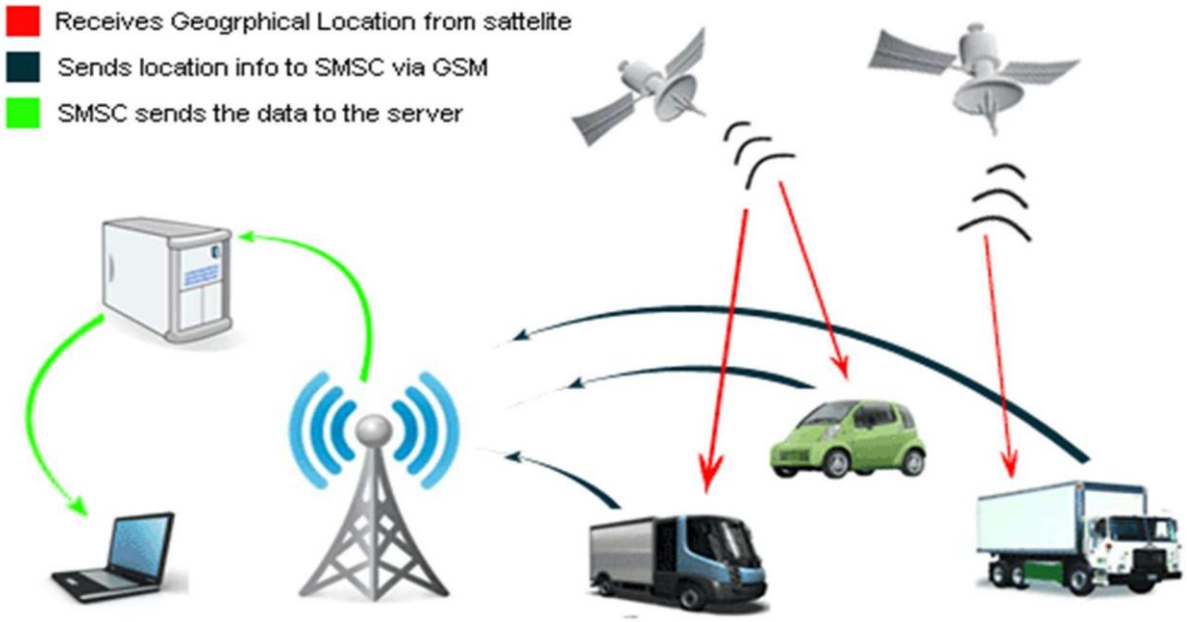
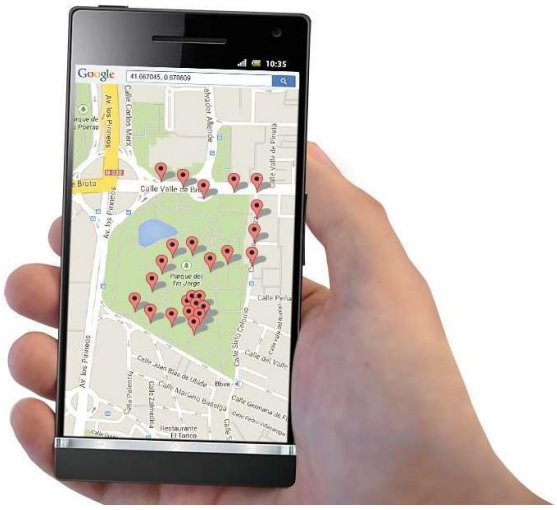


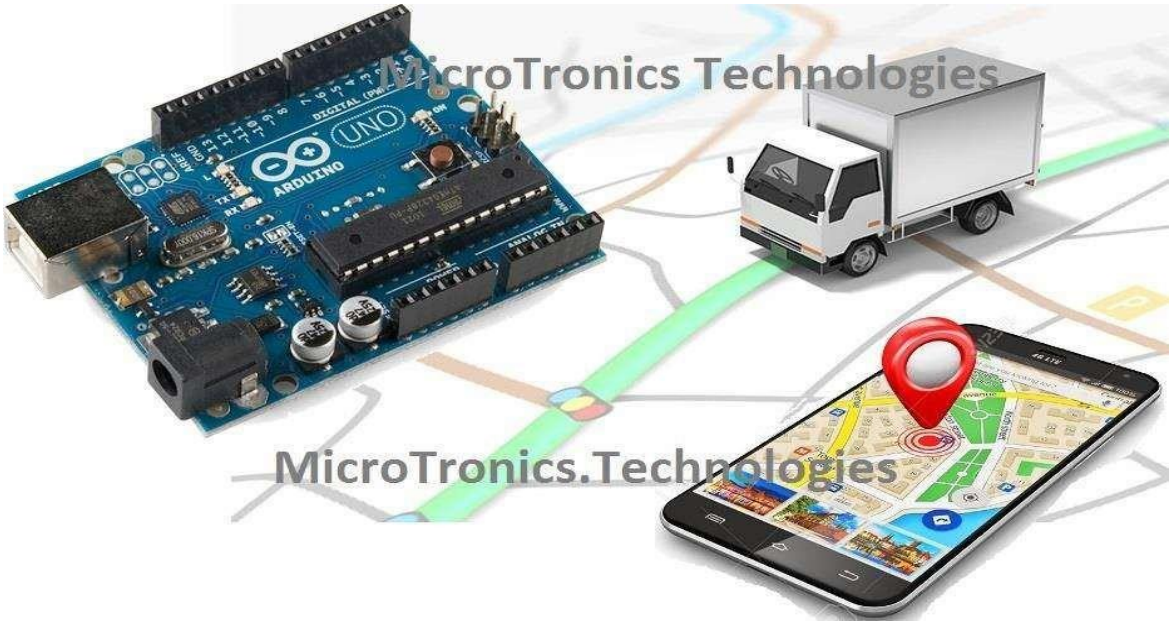
Figure 9.MOBILE VIEW of GPS location :-



6.2 System Implementation Technologies:-

- This GPS based human tracking system propose a cost effective method a tracking a human mobility using two technology viz General packet Radio service and global positioning system.
- The whole system allow user's mobility which to be tracked using a mobile phone which is equipped with an internal GPS receiver and a GPRS transmitter.

Figure 10- Arduino with mobile tracking System



6.3 Conclusions-

This paper Present our work for Normal GPS based human Tracking System do net project report and blind Person Tracking based an index assisted living environment. We have demonstrated how location of significance can be automatically updated from GPS data. WE have also shown the mark over chain algorithm that can incorporate these Location into a predictive model of the user's movement according to walking step variation.

The application works efficiently in tracking the user mobility as the accuracy of GPS is higher compared toother techniques. The problem of battery consumption due to the constant usage of GPS is addressed by automatic triggering of GPS based on time interval. The future enhancements can be the application must be tablet bookmark frequently used paths and developed across different platforms.

Tracking is very inv an so care must be taken to ensure that only essential information about that person is revealed. Levels of privacy can be controlled by incorporating intelligent systems and customizing the amount of detail in a given geographic information system.

If these types of measures are enforced GPS (racking can be used in an ethical manner which is beneficial (o (he person being (racked, not detrimental.GPS is an effective technology and it can potentially save lives, however many current applications are not suited to it. Many groups of people rely heavily on the technology even though it is prone to inaccuracies and unreliable at times. Technological convergence may correct some of these issues but a real problem is posed if the GPS network is solely relied upon.

It should be remembered that as we build more and more mission critical applications that rely upon GPS, that the US government can shut down parts of the system in times of crisis, in addition to having already existing problems maintaining their satellites. When using any form of GPS tracking device, backup systems need to be implemented, and a Murphy's Law type mentality needs to be encouraged: If the GPS can fail, it Wifi.

These findings apply to all parties which track the movements of others. These groups include police responsible for law enforcement, parole officers, caretakers of dementia patients, parents who want to track their children and

employers who track their employees. These groups need to ensure that the tracking of people is done in a just and ethical fashion. It is up to the trackers to ensure that the tracking of another human is done in a way which is beneficial to the person involved and the wider community.

6.4 Further research-

The next phase in this research is to carry out a group observational study. The observational study in this paper was limited to a single participant but it would be interesting to track the movements of a group of people.

A study like this could be used to investigate whether detailed portfolios can be created from anonymous participants based on their travel patterns. Another aim could be to create an intelligent system that would collect and analyze the movements of people automatically.

In addition to an observational study people who have had GPS tracking imposed on them could be interviewed to ascertain the emotional and psychological consequences of having a GPS tracking device attached 24/7 for long periods of time.

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