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Designing Feasible Mid-Point Location Determination from Multiple Geo-Points

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***Abstract*: In recent years, smart phone has become most important gadget for maintaining the daily activities and it also used by maximum population worldwide. Use of smart mapping technology is also increasing in large area like transportations, defense, sports, etc. Mapping applications are always depend upon current detection or preferred location of user or the group. Many application trying to get the user location to serve better service to location based services to user. Sharing location among group is better solution to know the individual's location. Finding or locating the location at known area or the known cities are usable and also feasible but at unknown location using these services may be risky or not feasible. Considering the condition any group wants to arrange a meeting at location which suits all the members hence it will always better to find centroid of the polygon generated by user geo-locations. It also has issue with finding better options of meeting while calculation. Proposed system aimed at finding the preferred and central location for user group using geo-point calculation and mapping technologies.**

***Keywords*: Multiple geo-points.**

1. Introduction

Location-based services (LBS) are a general class of computer program-level services that use location data to control features. As such LBS is an information service and has a number of uses in social networking today as an entertainment service, which is accessible with mobile devices through the mobile network and which uses information on the geographical position of the mobile device. This has become more and more important with the expansion of the smartphone and tablet markets as well.

LBS are used in a variety of contexts, such as health, indoor object search, entertainment, work, personal life, etc. LBS include services to identify a location of a person or object, such as discovering the nearest banking cash machine (a.k.a. ATM) or the whereabouts of a friend or employee. LBS include parcel tracking and vehicle tracking services. LBS can include mobile commerce when taking the form of coupons or advertising directed at customers based on their current location. They include personalized weather services and even location-based games. They are an example of telecommunication convergence.

This concept of location based systems is not compliant with the standardized concept of real-time locating systems (RTLS) and related local services, as noted in ISO/IEC 19762-5 and ISO/IEC 24730-1. While networked computing devices generally do very well to inform consumers of days old data, the computing devices themselves can also be tracked, even in real-time. LBS privacy issues arise in that context, and are documented below.

A. Locating methods

1) Control plane locating

Sometimes referred to as positioning, with control plane locating the service provider gets the location based on the radio signal delay of the closest cell-phone towers (for phones without GPS features) which can be quite slow as it uses the 'voice control' channel. In the UK, networks do not use trilateration; LBS services use a single base station, with a "radius" of inaccuracy, to determine a phone's location. This technique was the basis of the E-911 mandate and is still used to locate cellphones as a safety measure. Newer phones and PDAs typically have an integrated A-GPS chip.

In order to provide a successful LBS technology the following factors must be met:

- Coordinates accuracy requirements that are determined by the relevant service;
- Lowest possible cost;
- Minimal impact on network and equipment.

Several categories of methods can be used to find the location of the subscriber. R The simple and standard solution is GPS-based LBS. Sony Ericsson's "NearMe" is one such example. It is used to maintain knowledge of the exact location, however can be expensive for the end-user, as they would have to invest in a GPS-equipped handset. GPS is based on the concept of trilateration, a basic geometric principle that allows finding one location if one knows its distance from other, already known locations.

B. GSM localization

GSM localization is the second option. Finding the location of a mobile device in relation to its cell site is another way to

find out the location of an object or a person. It relies on various means of multilateration of the signal from cell sites serving a mobile phone. The geographical position of the device is found out through various techniques like time difference of arrival (TDOA) or Enhanced Observed Time Difference (E-OTD).

C. *Self-reported positioning*

A low cost alternative to using location technology to track the player, is to not track at all. This has been referred to as "self-reported positioning". It was used in the mixed reality game called Uncle Roy All Around You in 2003 and considered for use in the Augmented reality games in 2006. Instead of tracking technologies, players were given a map which they could pan around and subsequently mark their location upon. With the rise of location-based networking, this is more commonly known as a user "check-in".

D. *Others*

Another example is Near LBS (NLBS), in which local-range technologies such as Bluetooth, WLAN, infrared and/or RFID/Near Field Communication technologies are used to match devices to nearby services. This application allows a person to access information based on their surroundings; especially suitable for using inside closed premises, restricted/ regional areas.

Another alternative is an operator- and GPS-independent location service based on access into the deep level telecoms network (SSR7). This solution enables accurate and quick determination of geographical coordinates of mobile phone numbers by providing operator-independent location data and works also for handsets that are not GPS-enabled.

Many other Local Positioning Systems are available, especially for indoor use. GPS and GSM do not work very well indoors, so other techniques are used, including Co-Pilot Beacon for CDMA Networks, Bluetooth, UWB, RFID and Wi-Fi but which technique provides the best solution for a specific LBS problem? A general model for this problem has been constructed at the Radboud University of Nijmegen.

2. Related work

Igor Bilogrevic, Murtuza Jadliwala [1] proposed privacy-preserving algorithms for determining an optimal meeting location for a group of users. They perform a thorough privacy valuation by formally quantifying privacy-loss of the proposed approaches. They address the privacy issue in LSBSs by focusing on a specific problem called Fair Rendez-Vous Point(FRVP) problem. Given a set of user location preferences, the FRVP problem is to determine a location among the proposed ones such that the greatest distance between this location and all other users' locations is minimized.

Rinku Dewri and Ramakrishna Thurimella [2] proposed a user-centric location based service architecture where a user can observe the impact of location inaccuracy on the service before deciding the geo coordinates to use in a query. They construct a search application based on user-centric location-based service architecture where a user can observe the impact of location inaccuracy on the service accuracy.

Jing Liu, Zechao Li, Jinhui Tang [3] authors focus on the personalized tag recommendation task and try to identify user-preferred, geo-location-specific as well as semantically relevant tags for a photo by leveraging rich contexts of the freely available community-contributed photos. For users and geo-locations, they have different favored tags assigned to a photo, and propose a subspace learning method to individually uncover the both types of preferences.

Linke Guo, Chi Zhang [4] proposes a privacy-preserving revocable content sharing scheme in geosocial networks. Proposed scheme allows mobile users to share their encrypted location-based contents on an untrusted server without revealing genuine location information, and further enables other mobile users who physically check in at the particular location to search and decrypt the content if they have the equivalent attributes.

Muhammad Ridhwan Ahmad Fuad and Micheal Drieberg [5] present the development of the remote vehicle tracking system which integrates the Global System for Mobile Communications (GSM) Modem and Google Map.

Wei Xin, Cong Tang, TaoYang [6] uses LocSafe method, a "missed-connections" service is used which grantees based on RFID technology, in order to prove an encounter sharing among users in the past. LocSafe is comprised of three parts: RFID Tags, LE Collectors, and social service provider. They use RFID technology to detect encounters, and use attribute-based encryption and broadcast encryption to create trust and protect users, privacy. We evaluate LocSafe by a study of "missed-connections "troubles and study of system implementation.

Wei Li, Wei Jiao, Guangye Li [7] Location-Based Service (LBS) combined with mobile devices and internet become more and more trendy, and are widely used in traffic navigation, intelligent logistics and the point of interest query. However, most users worry about their privacy when using the LBS because they should provide their precise location and query content to the undependable server. This paper analyses the query association attack model for the constant query in mobile LBS.

Jianliang Xu, Xueyan Tang [8] identifies and addresses three new issues concerning location cloaking approach. First, study the representation of cloaking regions and show that a circular region generally leads to a small result size for region-based queries. Second, develop a mobility-aware location cloaking technique to resist trace analysis attacks. Two cloaking algorithms, namely MaxAccu_Cloak and MinComm_Cloak, are designed based on different performance objectives. Finally, develop an efficient polynomial algorithm for evaluating circular-region-based kNN queries.

Hanunah Othman, Habibah Hashim, Jamalul-lail Ab Manan [9] studies recent schemes designed to present location privacy and anonymity to LBS users. The main idea is to solve recent practical problem by proposing a new framework of LBS

Middleware called Trusted Anonymizer (TA) secured by Trusted Computing (TC) technologies.

Leone C. Monticone, Richard E. Snow [10] provides an analysis of the case where the MRs operate in or above circular service areas on the surface of a spherical Earth. The analysis provides an accurate and competent way, which is less complex than performing the calculations on the sphere, to compute true minimum distance ratios. The method uses stereographic projection to convert the original minimization problem into a simpler problem of minimizing a ratio of Euclidean distances, which is expressed as a function of a single real variable, over the boundaries of discs (i.e., circles) in the complex plane.

3. Proposed work

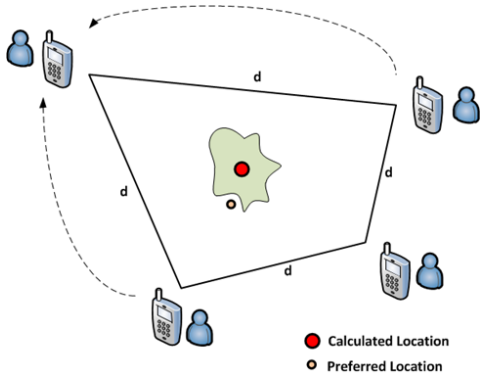

Fig. 1. Proposed system process diagram

Figure 1, shows the overall working process of proposed system. This process includes multiple stages of execution. As per shown consider a condition there are five users in group planning to meet in centrally preferred location then one user from all will become master user and after which all user will share their location with master user and master user will execute the process. After execution system will calculate the central location by calculating the centroid of the polygon created by the user's connection. Once system get the central location it will ask user about his preferred location and after this using Google mapping API system will find out the nearest location selected by the user and once it found system will inform all user about final meeting location and if user wants he can view the travelling path to the location.

4. Conclusion

This paper presented an overview on designing feasible mid-point location determination from multiple geo-points.

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