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OPTIMIZING THE LOCATION DEPLOYMENT FOR EMERGENCY MEETING SCHEDULING IN DISASTER RELIEF MANAGEMENT

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Abstract

State-of-the-art smart phones and mobile devices, today's highly interconnected urban population is increasingly dependent on these applications to organize and plan their daily lives. These applications often rely on current locations of individual users or a group of users to provide the desired service. The aim of this concept is to locate the volunteers in a peer group who were involved in disaster relief process and schedule meeting accordingly that coordinators of the process can effectively allocate the volunteers in order to serve the overall relief process efficiently.

The location of the individuals are tracked using GPS in smart phones and it gets updated in the Server. Based on the location of the volunteers, common place is identified using the Google maps and the distance is calculated using Google API to get a centralized place were the meeting can be carried out in order to distribute the relief funds and allocate volunteers effectively to serve the nearest affected zones. The meeting details would be intimated to the group through this application, so by this way it is advantageous in order to reduce time.

I. Introduction

Initially it was difficult to gather people for any emergency meeting. It was not much efficient to explicitly notify each and every person to be involved in the meeting. Scheduler need to know where the volunteers are and ask for them to assemble at the spot. Most of the existing systems are efficiently available only on Desktops, it was difficult to keep checking notifications all the time and gather people in a remote location and it is difficult to keep track of everyone and inform them on the destination in all circumstances.

Natural calamities or accidents happen unexpectedly and suddenly and it is very difficult to seek help for the most wanted quickly. It is also hard to find the volunteers and gather them in the right location, thus we need a tool that would help us to gather helping hands in right location and at the right time

II. Background

Scheduling meeting is an important task when it comes to gathering people, especially during natural calamities, where it is difficult for the rescue team to gather in a particular location knowing the closest volunteer to seek help. Hence it is essential to design an application that would help out this need. It is mandatory that the needy gets help at the right time and at the right situation. Effective meetings eases our tasks in resource management and other aspects of maintenance issues. For a proper meeting to be held, pre planning is required in order to notify the attendees and arrange all the essentials. But in case of any natural calamity happened in the city , it is not the case of pre-notification. All of a sudden a rescue team has to be assembled and an emergency meeting has to be conducted in order to handle the current situation. It is very essential to carry out an effective meeting in such cases in order to take up the right and wise decisions on time and work in a coordinated manner.

III. Importance

Since this kind of meetings is of short notice, rescue divisions find it difficult to inform the volunteers and the rescue team regarding the issue on time. They need to explicitly inform each and every person in the team and ask them to assemble in a spot. Out of which there might be a case were some of them might not be available in order to make it happen. So this concept of developing an application in order to locate the team members implicitly and notify the volunteers regarding the disaster happened on the closest region based on the availability of the volunteers in the city. This would be effective with respect to time and cost. The volunteers selected of such kind may reach the spot on time and would be cost effective, since the distance to reach by the volunteer from his current position is calculated using the vehicle parameter

IV. Innovation

The overall concept is that the location of the volunteers is tracked using the GPS in smart phones and it gets updated in the server. Based on the location of the volunteers common places are identified using the Google maps and the distance is calculated using two point distance formula to get a venue, where the meeting can be scheduled. The scheduled location is notified to the attendees.

IV. Literature Survey

The rapid proliferation of smart phone technology in urban communities has enabled mobile users to utilize context aware services on their devices. Service providers take advantage of this dynamic and ever-growing technology land scape by proposing innovative context-dependent services for mobile subscribers. Location-based Services (LBS), for

example, are used by millions of mobile subscribers every day to obtain location-specific information. Two popular features of location-based services are location check-ins and location sharing. By checking into a location, users can share their current location with family and friends or obtain location-specific services from third party providers. The obtained service does not depend on the locations of other users. [1] These systems have been successfully used in many applications such as asset tracking and inventory management. This paper provides an overview of the existing wireless indoor positioning solutions and attempts to classify different techniques and systems. Three typical location estimation schemes of triangulation, scene analysis, and proximity are analyzed. We also discuss location fingerprinting in detail since it is used in most current system or solutions. We then examine a set of properties by which location systems are evaluated, and apply this evaluation method to survey a number of existing systems. Comprehensive performance comparisons including accuracy, precision, complexity, scalability, robustness, and cost are presented. In general, measurement involves the transmission and reception of signals between hardware components of the system. An indoor wireless positioning system consists of at least two separate hardware components: a signal transmitter and a measuring unit. Algorithms: Location fingerprinting, Location positioning, closest- neighbor algorithm.[2] While agents may solve many problems typical to these environments, agents require special support from underlying architecture. Mobile agents, perhaps the most known class of agents,needs special treatment in these environments. Although moving agent's code from mobile device to stationary host, and running agent there solves the problem of unexpected disconnections, the migration process is sometimes too time consuming compared to traditional message passing. In this paper we discuss about agent communication issues concentrating on the problems the wireless environment causes, and give some guidelines how these problems may be solved. In interaction protocol layer, an agent may optimize its communication pattern by reducing the number of messages to send by coupling several messages to one. Moreover, an external observer agent may learn about communication patterns used by other agents, and optimize these patterns without interfering the communicating agents. Algorithms: naive compression, round-trips.[3] The proliferation of location-based services and applications calls for provisioning of location service as a first class system component that can return accurate location fix in short response time and is energy efficient., we present the design, implementation and evaluation of Wheel Local continuous system location service for outdoor scenarios. Unlike previous localization efforts that try to directly obtain point location fix, Wheelock adopts an indirect approach: it seeks to capture a user mobility trace first and to obtain any point location by time- and speed-aware interpolation or extrapolation. WheelLoc avoids energy-expensive sensors completely and

relies solely on commonly available cheap sensors such as accelerometer and magnetometer. With a set of novel techniques and the leverage of publicly available road maps and cell tower information, WheelLoc is able to meet those requirements of a first class component. Experimental results confirmed the effectiveness of WheelLoc. It can return a location estimate within 40ms with an accuracy about 40 meters, consumes only 240mW energy. Algorithm: Hidden Markov Model (HMM) and Viterbi algorithm.[4]

V. Limitations

The previous automated systems were efficiently available only on Desktops, it was difficult to keep checking notifications all the time and gather people in a remote location and it is difficult to keep track of everyone and inform them on the destination in all circumstances.

VI. Proposed System

The System aims to locate the volunteers in a peer group who were involved in disaster relief process and schedule meeting accordingly that coordinators of the process can effectively allocate the volunteers in order to serve the overall relief process efficiently. The location details of the volunteers are obtained from the GPS enabled devices they carry. Most commonly it would be their android phones with the Location tracking app installed in it.

Since they were able to carry their handy location enabled mobile phones with them, it is possible to track their location details dynamically by syncing it every time they move. Moreover it would also be beneficial in terms of communication. Meeting attendees can be selected out of the list and can be informed regarding the schedule by sending an alert or a notification directly to their mobile devices through the application. Meeting details are sent to the attendees as push notifications rather than as a message nor as an email such that it wouldn't be neglected by the user in any case.

VII. Proposed Frame work

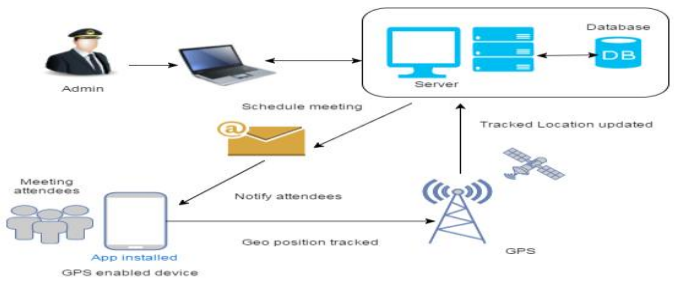

Fig1.1

A. **Tracking the location using Google Maps:** The Google Maps is embedded in the application using Google Maps JavaScript API V3. All maps API applications should load the Maps API using an API key. This API key is

embedded in the JavaScript which loads the Google maps. The latitude and longitude coordinates are received from the database and are plotted using Overlays. Overlays are objects on the map that are tied to latitude and longitude coordinates. Markers identify locations on the map, thus placing a marker on the desired location of the map.

B. **Selecting the users and getting the common places:** From the database, the admin will select the group of users for the meeting and their latitude and longitude will be tracked and the common places will be retrieved from the Google Maps and would be displayed to the scheduler for the further decisions to be taken in order to conduct meeting.

C. **Getting venue by prioritization the vehicle parameter:** From the available common places the venue will be selected by using the vehicle parameter. The venue will be sorted in such a way that, the user using 2-wheeler will take much time than the user using 4-wheeler.

D. Sending the meeting Details

The scheduled meeting will contain the meeting name, organizer, time and venue. Finally, it will notify users on meeting location. These meeting details are sent to the attendees directly through their phones as push notifications. This is actually carried out by generating a unique GCM id for the members phone. Initially when the members join the team they must be provided with the developed android tracker application .Members need to install that apk file in to their phones and must register their mobile numbers in to that application . On registering the phone numbers , application generates the unique GCM id for the mobile phones and stores that in database for further use. This GCM id is taken as reference for uniquely identifying the persons by the application and sends the notification to the correct members.

VIII. Methodology: As described in the framework there would be two set of peoples. One is scheduler and others are attendees. There would also be two set of applications used in this concept. One is the web application that works in the sites of schedulers and other is an android application that would be used by the attendees in order to receive notifications and update their locations by syncing the device. Each time when they sync the device the current geo position of the members gets updated in the database. It is further used for calculating the common places for the attendees and predicts the closest venue for all the attendees through certain parameters mentioned.

IX. Advantages of the system: Since, the application is available in Mobile phones, it is efficient for us to track, inform, and gather volunteers in specified location. Thus this means of meeting scheduling consumes less time and energy, also becomes very easy for the coordinator to handle and conduct meeting in any situation.

X. Conclusion and future work

Natural calamities or accidents happen unexpectedly and suddenly and it is very difficult to seek help for the most wanted quickly and gather volunteers at the right place. This application helps in identifying the closest destination to gather every volunteer in a particular location based on their geo position for faster commencement of the meeting. We might not have proper network signal to keep the team informed at remote location during adverse weather conditions which yields a path for future work.

References

1. Igor Bilogrevic*, "Privacy-Preserving Optimal Meeting LocationDetermination on Mobile Devices.*
2. Hui Liu, "*Survey of Wireless Indoor Positioning Techniques and Systems".*
3. Heikki Helin*" Mobile Agent Communication in Wireless Networks"* University of Helsinki, Department of Computer Science. Kluwer, 2004.
4. Wang∗, Zhiyang Wang†, Guobin Shen‡, Fan Li‡, Song Han§ and Feng Zhao
5. *"WheelLoc: Enabling Continuous Location Service on Mobile Phone for Outdoor Scenarios"* 2013 Proceedings IEEE INFOCOM
6. García-Macías, J. A., Rousseau, F., Sabbatel, G. B., Toumi, L., & Duda, A. (2002). Différenciation des services sur les réseaux sans-fil 802.11. In *Actes du 9e Colloque francophone sur l'ingénierie des protocoles (CFIP'2002)*.
7. Hartmann, J., & Song, W. (1999, March). Agent technology for future mobile networks. In *Second Annual UCSD Conference on Wireless Communications in cooperation with the IEEE Communications Society, San Diego, USA*.
8. Gürer, D., Lakshminarayan, V., & Sastry, A. (1998). An intelligent-agent-based architecture for the management of heterogeneous networks.
9. McGuire, M., Plataniotis, K. N., & Venetsanopoulos, A. N. (2003). Estimating position of mobile terminals from path loss measurements with survey data. *Wireless communications and mobile computing*, *3*(1), 51-62.
10. Yang, B., Liu, D. Y., & Yang, K. (2002). Communication performance optimization for mobile agent system. In *Machine Learning and Cybernetics, 2002. Proceedings. 2002 International Conference on* (Vol. 1, pp. 327-335). IEEE.