



Prevent Crime Using Mobile- A Practical Approach

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Abstract— This paper proposes an approach to prevent crime by applying a well-defined architecture. It gives the detailed information on setting up the process and the steps which will help in building the algorithm to prevent crime. Also, it throws light on usage of predictive analysis in the approach mentioned to fight crime. The approach finds usage not only in fighting crime but also an effective means to replace the GPS setup currently used in transport vehicles which in addition will save lots of money.

Keywords- Database, Network Tower, Crime Prevention, Transport system, GPS technology.

I. INTRODUCTION

Crime prevention [1] is the attempt to reduce and deter crime and criminals. In olden days, the approach used by the criminal justice system followed:

- Crime size;
- major factors influencing the incident of criminal activities;
- how to deal with offenders; and
- How to deal with victims.

A crime prevention policy to deal with crime requires that the conventional immediate response to crime must be extended to take into consideration the social circumstances which contribute to the enlarged probability of the occurrence of criminal events.

Today's mobile handheld devices have become a feasible medium for carrying out an extensive variety of actions, involving information exchange. One of an important area in society where mobile technology is gaining usage is crime prevention, crime detection and reporting. The high computational power of smart phones, tablets and PDAs accounts for high demand and usage by the general public. [2] The development of cellular networks technologies is another main issue which makes mobile phone technology a viable mode for fighting crime.

Today, a number of computer based systems also referred as intelligent systems, have been developed for crime detection and reporting. Some of them are: Submit Tip, webcast, Mobile Vic PD, Accurint, Cop link, IPOL-Mobile.

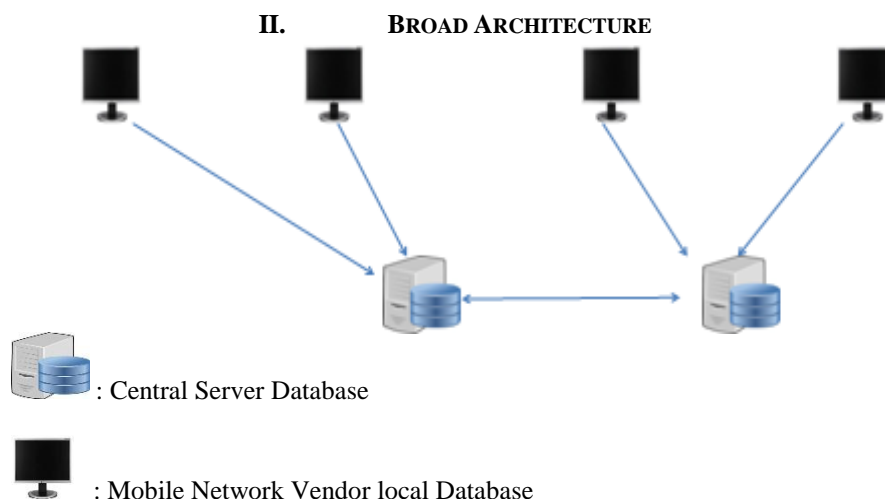


Fig. 1 Broad architecture view of server level communication and database handling of criminal files

The local database will register any new number registration and will sync up with the information contained in the central database server which itself will communicate in distributed environment for make up for bulk data load balancing. If the image is matched up with any existing criminal data, the central database server which will contain the information of criminal like phone number, image, past criminal activities will get updated with the additional phone number so as to keep track as and when needed. This will help the police to keep track of the criminal activities.

III. APPROACHES USED FOR PREVENTION

First Prevention Approach: Suppose any criminal activity is reported then the report can be based on any of the following types:

- 1) *Criminal Name:* If the criminal name is known, his or her current location can be get directly from the database together all other past records at the click of one command by proper administrator.
- 2) *Sector of crime:* With the past records, criminals can be data mined and using predictive analysis, list of fewer criminals can be traced out.
- 3) *Type of crime:* Again, a criminal is often motivated to do a similar kind of crime based on research. So, it may prove useful to make use of this approach to list out fewer criminals which will help police to solve the crime.

A. *Second Prevention Approach:*

Consider the case if someone is in danger and he or she is not able to call. He or she may send a miss call to an emergency number which will activate and would send a constant location to the dear ones and to the concerned nearest police station asking for help which may prove useful to track the person and prevent from any happening. The diagrammatic representation can be illustrated as follows:

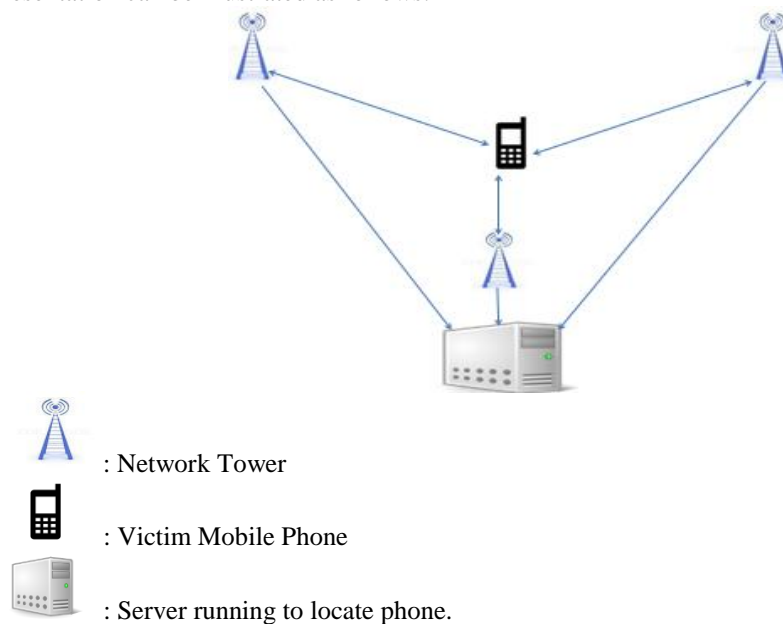


Fig. 2 Pictorial representation to locate mobile

Upon getting a missed call or call, the algorithm will start running on a central server and it will send a location request for the mobile phone. After receiving the location, the server will transfer custom message to three registered numbers which is stored in the database respective to the caller number with an SOS message along with the current location. The location will get updated after every 3 to 5 minutes and new message will be send. Moreover, the application can be enhanced with the feature of sending message to the nearest police station or to the nearest police control room to take quick action. This will help the police to prevent crime.

IV. METHODOLOGY

- Step 1: Maintain a database of criminals.
 - Step 2: One way connection to sync mobile network database server with central server.
 - Step 3: Two way communication with the multiple central servers (distributed setup).
 - Step 4: Algorithm to fetch location of the caller and sending custom message to the aforementioned numbers associated with number.
 - Step 5: Fetching nearest police control room number and forwarding message with the caller detail.
 - Step 6: Fetching a list of criminals in case criminals name is registered for a crime and forwarding the list to the police track criminal server.
 - Step 7: Listing out the criminals data based on the type of crime registered and current location based on the mobile number registered in the database and forwarding it to the police server.
 - Step 8: Listing out the criminals based on the area of crime registered by running a bulk location request which sends request of criminal's current location to the location retrieval server after listing out a specific numbers of criminals who intentionally do crime in such areas.
- The steps 6, 7, 8 are based on predictive analysis which can be more enhanced to improve the system and help to fight crime.

V. RELATED WORK

One main difficulty hindering crime detection and reporting is the need of common platform between the police and public in order to exchange the useful information. In this paper, a mobile infrastructure [2] for detecting, tracking and reporting is proposed in which a criminal who commit crime using mobile is shown. It follows a client-server architecture which allows the public to exchange, various crime information in real time with the police or law agencies. This platform can be used in metropolitan to control crime by implementing it as a security assistant. In this, it is necessary that the system must be up to date in case of crime suspects and criminal activities. Details of the crime can be uploaded by public as well as police but can be accessed only under particular norms.

Location based services are becoming popular as they provide user their current location information. The demand for locating a position accurately and at low cost is increasing day by day. Here, different techniques for locating the user is proposed and also an algorithm is derived which helps in deciding the most efficient and the best method to locate the position based on the user requirements. The algorithm dynamically deactivates [4] different positioning techniques and activates only those positioning methods with least energy consumption. Various positioning techniques like GPS-locations, GPS-based solutions, GPS System of Satellites, and also various Non-GPS Location solution like Cell-ID solutions, Cell-ID and Rxpower levels, Angle of Arrival Time-of Arrival, Time of Arrival solutions, Enhanced observed time difference Wireless-LAN based solutions are proposed based on which the algorithm works and finds the best locating technique.

Various Location-based services are gaining popularity towards proactive LBSs. In order to detect user and surrounding objects, the proactive LBSs need continuous position tracking. A hierarchical positioning algorithm is proposed which provides a general algorithmic optimization [7] in order to extend existing positioning APIs to track user's position efficiently and also accurately. This algorithm not only activates the efficient positioning technique with least energy consumption but also it provides sufficient accuracy. Results show that up to 90 percent reduction in energy consumption as compared to conventional GPS tracking. Several power saving algorithms are applied and encapsulated into the API.

Technologies used today give accurate results but it requires substantial financial investment. In this, accuracy of Cell-ID in various scenarios is evaluated and then the concept of discovery noise and discovery accuracy is introduced in order to estimate the accuracy impact on quality of resource discovery services. The experiment also shows that how Cell-ID can be effectively exploited [10] to implement more effective and efficient voice location based services. Cell-ID's performance is calculated based on the scenarios, average distance, proximity, discovery accuracy and discovery noise based on which the location based voice services are improved by Cell-ID. The results show that the size of recognition grammar can be reduced and also the recognition process can be speeded by a factor larger than ten.

Limited sensing resources are used to monitor dynamic environments for which surveillance application is used. So there is increase in demand of self optimizing wireless sensor networks. In order to design and evaluate the performance of autonomous mobile wireless sensor networks, TeamSense, a modeling framework is presented. Each sensor node is programmed to allow peer communication to track several objects with less energy consumption. The sensor nodes regularly fuse the data to enhance the prediction of object. Various experiments are performed to calculate the performance of the network. The results show that TeamSense algorithms [15] are efficient and achieve high level tracking performance while maintaining low energy consumption level and also by using limited resources for sensing. A simulation tool is also developed in order to evaluate and implement the TeamSense framework.

In wireless sensor networks there are various issues which need to be resolved like low packet delivery rate and high energy consumption. A prediction Based Tracking Technique using Sequential Patterns is used by object tracking sensor networks which provides minimum energy consumption. The results show that OTSN provides more efficient energy consumption in comparison to other tracking techniques. To increase the network life time, it has two stages, one is the Energy Calculation and the other is the Route Finding. In order to predict the future location, Markov Decision Process or learning techniques is proposed which reduces the object missing rate. Total energy consumed by the network [16] during the simulation period, shows that ratio between missing reports and total number of reports is low.

For continuous object tracking, there are a number of protocols which predicts the future boundary shapes of continuous objects and it is a very efficient strategy. Still, for a randomly deployed practical sensor networks with void, more advanced algorithm is required. If the predicted area consist the void area, then there can be a major cause of many error detections. A chaining selective wakeup [17] scheme is proposed in which information of void area is collected and if next boundary area is void area then the chain area is activated with an activation control message.

VI. APPLICATIONS

The above defined approach is put in simpler format but it can be put to use in tracking many different things. It can be replace the exhaustive GPS technology for monitoring the location of vehicles by transport agencies. The approach would prove to be cost effective since it does not require much energy in transmitting large bandwidth signals as in the case of GPS technology and since less bandwidth is used so lesser traffic and hence cheaper means of locating vehicles.

Also, as already mentioned, it can be put to use by the police department to keep track of criminals and by using predictive analysis approach, provide a list of criminals to the police to make their hard work easy in a sense to crack the case. Moreover, it can help to prevent from many crimes to happen since it can help the police to track the victim.

VII. CONCLUSION

This paper is aimed at providing with the information of setting up the infrastructure and approach to help prevent crime using information technology. The above approach will surely hamper crime. Moreover, other branches of study like usage of predictive analysis, artificial intelligence, Big data approach to large data sets can be put in to enhance the crime prevention system. Also, above approach can be put in different applications like vehicle location detection in transport industries.

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