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Traffic Rule violation Detection System

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ABSTRACT

The current police system has very few digitalized features. With the increase in crime and corruption, bringing smartness in police workforce has become a necessity. Digitizing these systems will improve the efficiency of the systems. Digitizing can also give various advantages like reducing old file work, detailed description of crimes, ease of communication between common people and police, efficient access of criminal details, ease of police work etc. In the 21st century where mobile and information technology have become an integral part of our lives. A new area where mobile integrated with technology is useful for crime reporting since readily accessible information is not available at any point in investigation this is a key drawback for communication in police department. Thus, using cloud, we will try to make all the information related to the criminals available on the Android Application to the police during their investigation which would speed-up the entire process of tracking down the criminals.

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I. INTRODUCTION

Now in daily routines mobile and information technology are integral part of our life's. from this technology our life become easily and fast done every work so we are try to develop application that making police department work easily and fast. So we are developing digitization of police system using LBs and data mining application in android which is help to police department to work efficiently and flexibly. From this they not have to take there time to store record files of criminals and managing them at huge amount on data it going to difficult so for helping them. we are designing android application which helping them for storing huge amount of data efficiently and managing it flexibly.overcome communication problem here during verification and collecting and store evidences of crime from this application it going to take less time for investigation.

II. LITERATURE SURVEY

III.

.2.1. Data Mining Traffic crime Investigation

Data mining based systems for analyzing traffic crime information and thus automates the crime investigation procedure of the police officers. The usability of these frameworks utilize a mixing of data mining methods such as clustering and classification which is use for effective investigation of the criminal acts.

Drawbacks of the System

The insertion of a new row to the table a complet methodology. for additional, the spatial and statistical analysis tools access an instantiation file, obtained during the record set creation, to query the specific information from the record set. This creates an overhead for the entire working of the framework.

2.2. Mobile Positioning

Mobile positioning refers to the determining of the current position of mobile devices. Generally, the positioning technique is based on the communication between mobile devices and the closest base stations. The base stations may be cell site tower, WiFi or GPS satellite.

The mobile positing used in the mobile devices are as follows.

1.Network-based positioning uses cell site towers to determine the location. It requires at least three cell sitesto calculate the position.

2.WiFi Positioning System (WPS) uses hotspots to determine the location. However, WPS is mainly usedin indoor positioning.

3. GPS (Global Positioning System) uses the satellites to determine the location. GPS is the best technology for outdoor positioning that tracks the movement of the mobile devices.

2.3. Data mining framework for traffic crime pattern identification

In this framework we use of clustering algorithm to help detect the Traffic crime patterns. Kmeans clustering also use to support the traffic crime pattern identification task. The clusters of crime are used to outwardly spot the hotspots of crime. The framework also uses semi supervised learning for finding information from crime records.

Drawbacks of the System
The Semi-Supervised or Expert-based standard of critical thinking is time consuming and tedious. In view of the weighted clustering attributes, the dataset for crime patterns are grouped and the outcomes are introduced to the domain expert along side the weights of the vital attributes.

2.4 Common Integrated Police Application (CIPA)

CIPA is a multilingual application to computerize the courses of action at primary sources of data such as Police headquarters and to construct a crime and criminal information framework based on CCIS. It gives an effective method of organising crime records for creating inquiries/reports and crime analysis for decision support. The CIPA Software is created in JAVA and utilizes Post gres Relational Database Management System (RDBMS). Noteworthy diminishment in manual records/registers kept at the Police Stations and disposal of copy or conflicting record keeping are the primary targets of CIPA.

2.5 Crime and Criminal Tracking Network System (CCTNS)

The CCTNS venture is an advanced software application which would enable the police organization to take policing to the following levels. It is a mission mode project under the National E-governance plan of Government of India .The objectives of the framework to facilitate collection, storage, recovery, examination, exchange and sharing of information and data at the police station and between the police station and the State Headquarters and the Central Police Organizations .

Drawbacks of the System
The framework creates statistic criminal networks. At the same time in the current scenario, the criminal systems are mostly dynamic.[5]

III. MATERIALS AND METHOD

1. Technologies to be used

- Internet
- JFreeChart
- jdk 7 ore above
- Eclipse
- Apache tomcat 7
- Android Studio
- Web portal using HTML, CSS, JSP, J Query
- Graph panel for Survey report

The system needs the following specifications:

- Software Requirements:
  - Internet
  - JFreeChart
  - jdk 7 ore above
  - Eclipse
  - Apache tomcat 7
  - Android Studio
- Hardware Requirements:
  - 250 GB HD
  - 4 GB RAM

IV. SYSTEM MODEL

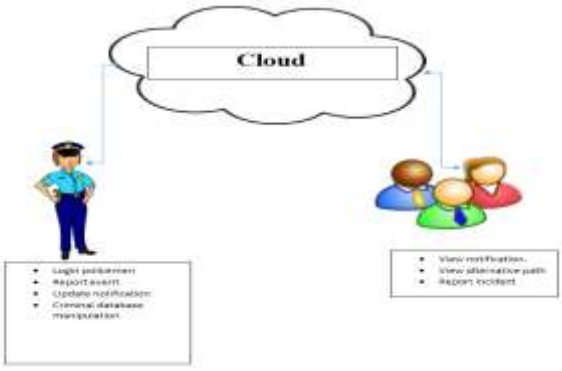


Fig 1: System Model

provides an application for the user that would provide an alternate path for the users passing by crime area. It allows user to report incidents and get it verified by the police officials. It will consist of an application for police officials which can perform database operations on criminal record and allows efficient retrieval of required information from the centralized database present on Cloud. The application targets general public and police officials for managing the incidents and crime without consuming much time.

In previous years police used files to maintain all criminal records like words documents but increases in crime and corruption rapidly so maintaining records is going to much difficult for handle and not readable to accessing it maintaining is difficult. From the understanding this problem for handling files and criminals records so we have to solve this problem so we try to develop application which handling record of crime and describe its crime in detailed. In order to create an application that facilitates report crime in a secured and covert way, we digitised the crime reporting System in a University Campus setting. We achieved this by breaking down our solution to two components: front and back end. The system back-end addresses the communication and storage of the application. The front-end focuses on the development of the user interface. The interface allows users to create and effectively fill crime reports resembling the existing paper based crime report in a secured and covert way. The interface also allows for two types of crime reports. The first, which is tagged "a full crime report" is based on the digitisation of the existing paper based reporting system. The second report type tagged "emergency report" will automatically compile relevant user data and allow the user to send a report quickly in adverse conditions.

V. ALGORITHM

5.1K MEAN CLUSTERING:

k-means is one of the simplest unsupervised learning algorithms that solve the well known clustering problem. The procedure follows a simple and easy way to classify a given data set through a certain number of clusters (assume k clusters) fixed apriori. Finally, this algorithm aims at minimizing an objective function know as squared error function given by:

$$J(V) = \sum_{i=1}^{c} \sum_{j=1}^{c_i} (\|x_i - v_j\|)^2$$

where,

'$||x_i - v_j||$' is the Euclidean distance between x_i and v_j.

'c_i' is the number of data points in i^{th} cluster.

'c' is the number of cluster centers.

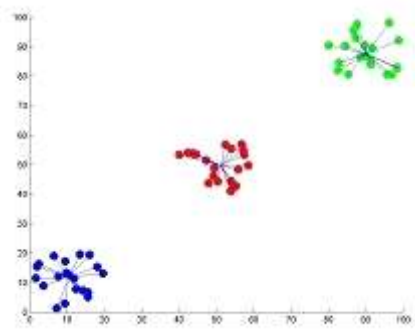


Fig 2: Showing the result of k-means for '*N*' = 60

5.2 HEURISTIC ALGORITHM:

The term heuristic is used for algorithms which find solutions among all possible ones. These algorithms,usually find a solution close to the best one and they find it fast and easily.Sometimes these algorithms can be accurate,that is they actually find the best solution, but the algorithm is still called heuristic until this best solution is proven to be the best.

Example:
A well-known example of a heuristic algorithm is used to solve the common Traveling Salesmen Problem. The problem is as follows: given a list of cities and the distances between each city, what is the shortest possible route that visits each city exactly once? A heuristic algorithm used to quickly solve this problem is the nearest neighbor (NN) algorithm (also known as the Greedy Algorithm). Starting from a randomly chosen city, the algorithm finds the closest city. The remaining cities are analyzed again, and the closest city is found.

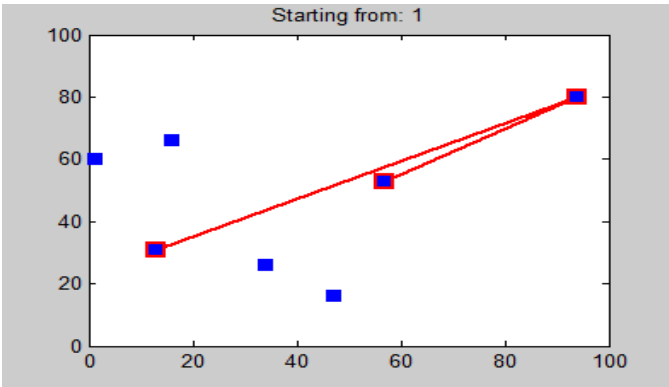


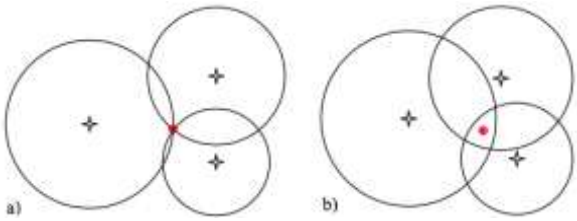
Figure 1: Example of how the nearest neighbor algorithm functions.

These are the steps of the NN algorithm:

1.Start at a random vertex
2. Determine the shortest distance connecting the current vertex and an unvisited vertex V
3.Make the current vertex the unvisited vertex V
4.Make V visited
5. Record the distance traveled
6.Terminate if no other unvisited vertices remain
7.Repeat step 2

5.3TRILATERATION:

In geometry, trilation is the process of determining absolute or relative locations of points by measurement of distances, using the geometry of circles, spheresor triangles. In addition to its interest as a geometric problem, trilateration does have practical applications in surveying and nevigation, including global positioning system(GPS). In contrast to triangulation, it does not involve the measurement of angles.



5.4 HAVERSINE FORMULA:

This program calculates the distance between two locations (latitude and longitude) using the Haversine formula. The Haversine formula gives the shortest distance between two points over the earth's surface, ignoring elevation, hills, etc...

$a=\sin^2(\Delta latDifference/2)+\cos(lat1).\cos(lt2).\sin^2(\Delta lonDifference/2)$

$c=2.atan2(\sqrt{a}, \sqrt{(1-a)})$

$d=R.c$

VI. MATHEMATICAL MODEL

System Specification:

S= {S, s, X, Y, T, f_{main}, DD, NDD, f_{friend}, memory shared, CPU_{count}}

- **S (system)**:- Is our proposed system which includes following tuple.
- **s (initial state at time T)** :-GUI of Police System. The GUI provides space to enter a query/input for user.
- **X (input to system)** :- Input Query. The user has to first enter the query. The query may be ambiguous or not. The query also represents what user wants to search.
- **Y (output of system)**:- List of Crime Reports with all details. User has to enter a query into Police System then Police System generates a result which contains relevant and irrelevant Crime Reports and their details.
- **T (No. of steps to be performed)**:- **6**. These are the total number of steps required to process a query and generates results.
- **f_{main}(main algorithm)** :- It contains Process P. Process P contains Input ,Output and subordinates functions. It shows how the query will be processed into different modules and how the results are generated.
- **DD (deterministic data)**:- It contains Database data. Here we have considered OLD i.e. Crime records contains the users crime with the criteria rules which contains number of ambiguous queries. Such queries are user for showing results. Hence, OLD is our DD.
- **NDD (non-deterministic data)**:- No. of input queries. In our system, user can enter numbers of queries so that we cannot judge how many queries user enters into single session. Hence, Number of Input queries are our NDD.
- **f_{friend}** :- CF, IE, UR, CR in our system are the friend functions of the main functions. Since we will be using both the functions, both are included in f_{friend} function. CF is Crime Fields which is based for submitting the details to the server and IE is Information Extraction which is used for extracting information on browser. CR is based on the Crime fields added into the Surveyors system for submitting the data to the server. CR is input to the CF. UR is based on the Users information stored on to the Database.
- **Memory shared**: - Database. Database will store information like list of Surveyors, web users, and its registration details and numbers Crime happened in the particular area. Since it is the only memory shared in our system, we have included it in the memory shared.
- **CPU_{count}**: - 2. In our system, we require 1 CPU for server and minimum 1 CPU for client. Hence, CPU_{count} is 2.

Subordinate functions:

- Identify the processes as P.

  S= {I, O, P....}

  P= {UR,CF, IE,CR}

  Where,

  - UR is User Registration
  - CF is Crime Fields
  - IE is Information Extraction.
  - CR is Crime Report

- **UR= {U, SUBMIT, MESSAGES}**

  Where,

- U=input Query using the information
- SUBMIT = {1, 2, 3, … , n}
- MESSAGES is output of UR which is Status Messages.

- **IE= {CP, NLP Techniques, Info}**

  Where,

  - CP is input which is filter information to IE
  - NLP is use for transforming all the letters to lowercases, stemming and removing stop word.

VII. CONCLUSION

In this paper we try to overcome the problem of store huge amount information of criminals record during periods of investigation time to retrieve and managing the data on cloud is solve from this android application through .And also overcome the problem of communication of police and user between by digitization police system.

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