SAFETY ZONE

CB.EN.U4ECE18112-CHANDHANA.S

Electronics and communication engineering

Amrita vishwa vidhyapeetham

Coimbatore,tamil nadu

SAFETY ZONE

CB.EN.U4ECE18112-CHANDHANA.S

*Electronics and communication engineering*

*Amrita vishwa vidhyapeetham*

*Coimbatore,tamil nadu*

***Abstract*—**

***The threat to women safety, especially on road, has become a major concern these days and the problem is increasing dramatically. Women are unsafe not just in the night but also in the day, they fear getting assaulted not only in public transport but also while travelling in cars and two-wheelers. People are harassed on road in various ways like robberies, killings, etc., but women go through even bigger traumas. Cases like, rape in moving cars, sexual assault and robberies by forcefully stopping the vehicle, teasing women on two-wheelers, etc. have increased to an alarming level.***

***These locations are grouped by clustering them on the basis of the crime history of that location. The app as a result suggests the best three paths in different colours***

***Keywords—crime against women; safest path; maps; location; clustering of locations.***

Introduction

The problem of crime is growing every second in our country.Crimes like rape, robbery, murder, theft, kidnapping, etc have increased a lot. But cases about crimes against women, especially sexual harassment, robbery,rape and molestation have shot up dramatically. Unfortunately, there is immense insecurity and fear in the fair sex when they are out on the road, not just a t night, but also in the day. This insecurity in the society has driven the idea behind this project. It enables women to see the safest route from one place to another, with the objective to make travelling for women as safe as possible.we have taken areas of coimbatore city,All the locations of the city are clustered on the basis of the crime records of that location. The crimes against women are given more weightage.(rape-5,accident-2,theft-1,murder-2).

The centre of each cluster is the index of that cluster. Each cluster is assigned a magnitude index according to the index calculated. The safest route is determined by calculating the danger index, which is the average of the index of each location in the path. The user enters the source and destination at the maps interface and the map shows the path along with its danger index to determine if the path is safe or not in motive to avoid any place which is prone to

mishaps with women instead of getting into any problem, as precaution is always better than cure. This will keep them untouched from any ugly feeling and keep their confidence uplifted.Social development is one of the key factors that help prevent crime. In this study, unsupervised learning technique is applied on crime records to predict the type and intensity of crime. This work will be very helpful to the police department in order to decrease crime.

LITERATURE

Crimes are a social displeasure and cost our society heavily in various ways. There is a considerable range of references and referrals on crime analysis for detecting a safe path form one place to another. Akaash Vishal Hazarika, discussed about clustering of the crimes of Delhi using distinct metrics of calculating distance. The two metrics tested in this paper are Haversine and Euclidean distances. Further, K-Means algorithm has been applied on the ‘Missing Children Dataset of Delhi’ using Euclidean distance and Haversine distance and the results have been compared. Adel Ali Alkhaibari, have discussed about using cluster analysis to reduce crime. Two clustering algorithms – K-means algorithm and agglomerative algorithm – are studied and applied to ‘The Stop, Question and Frisk Report Database’, City of New York Police Department, to cluster all the locations according to crime and predict the result. Thakral, Motivated us to compare between seven categories of clustering – Hierarchical clustering algorithm, Density based clustering algorithm, Partitioning clustering algorithm, Graph-based algorithm, Grid-based algorithm, Model-based clustering algorithm and Combinational clustering algorithm. Agarwal, elaborated on k means clustering technique of data mining used to extract useful information from a huge crime dataset and to interpret the data which assist police in identify and analyse crime patterns to reduce further occurrences of similar incidence and provide information to reduce the crime.

Richard Frank, have worked with a different clustering algorithm on crime data to evaluate the activity paths of offenders. This algorithm is based on K-means algorithm and modified for angles.

PROPOSED WORK AND BLOCK DIAGRAM

IN this work, user can find if the path is safe or not as well as report crime in any locality of coimbatore. The various regions of the city as available in the dataset, are clustered using k-means algorithm on the basis of the crime rate. This crime rate is calculated by giving more weightage to some particular crimes against women. Accordingly, clusters are formed containing locations of similar type. Each cluster is assigned with a crime index ranging from 0 to 10. It is calculated, for each custer , by giving special weightage rape. For each cluster of locations, the mean of these features is summed up and then resultant sums are sorted in increasing order. The cluster with minimum sum gets minimum crime index 0 and consequently the one with maximum sum gets maximum crime index 10. The localities along with their final crime index are stored in the database. Gmplot maps feature shows the colour of route according to danger index.

**BLOCK DIAGRAM**

START

Database is given as input(SPFINAL EXCEL.xlsx)

Grouping nearby regions : Clustering by k-means++

Input::source and destination coordinates from user

Routes are fetched from ROUTES API

(TomTom)

ROUTE danger index is calculated.

The route is coloured according to the ROUTE danger index calculated.

STOP

RESULTS AND DISCUSSIONS:

1. DESCRIPTION OF DATABASE:

this dataset contains longitude and latitude of different places in city,along with no. of crime taken place in that region(rape, murder, theft,accidents).each crime has been given different weights.nearly 240 points across the targeted regions have been taken,their latitude and longitude was found and no.of crime was noted accordingly,danger index for each point is calculated using the weights of each crime. A sample of our dataset is given below,

1. CLUSTERING:

After scaling the data, clustering of data is performed, for

which, the best clustering algorithm is selected. The

K-means++ algorithm was used. To use this algorithm, the total number of clusters in which the data has to be divided for accuracy reasons has been taken as 20 . After this, K-means++ is applied to the dataset. After assigning a cluster to each of the data points by the algorithm, the crime index of each cluster is computed, (ranging from 0 to 10), for which, the mean values of all clusters points are considered. Since the concern of this study is women safety, the crime index of each cluster is calculated by giving special weightage to the features – rape, sexual harassment and gang-rape. For each cluster of locations, the mean of these features is summed up and then resultant sums are sorted in increasing order. The cluster with minimum sum gets minimum crime index 0 and consequently the one with maximum sum gets maximum crime index 10.

1. MAP IMPLEMENTATION:

TomTom ROUTING API is initialised with the allocated Private API Key. An inbuilt library called “GMPLOT” is loaded simultaneously. A Hash is initialised to store:

 Crime Index of the localities.

 Latitude and Longitude of the Localities

As the user enters the “Origin” and “Destination”, map returns routes according. Now the danger index Of the route is calculated and coloured as follows:

|  |  |
| --- | --- |
| **COLOUR** | **LEVEL OF DANGER** |
| RED | CRIME PRONE |
| YELLOW | CAREFULL |
| BLUE | SAFE |
| WHITE | HIGHLY SAFE |

TABLE 2

**CONCLUSION**

In this paper, K-means clustering algorithm is being applied to solve the social concern of women safety. This is an attempt to deduce a solution or prevention of the hardships faced by women while travelling across the city. The system through its map interface, eases the identification of the safety of the path. It solves the problem of inefficacy to implement maps in the various referred papers. The concept of finding the safety or danger level of the path , plays an important role to meet the safety requirementsof the respondents, particularly, female respondents. This is done by predicting and clustering the crime-prone areas using the available history of crime for all the regions in coimbatore.

Efforts to ensure the progressive implementation of the above-mentioned mechanisms and standards can benefit greatly from partnerships and the development of relevant public policies, supported as appropriate by the international community.

**REFERENCES:**

1. ORACLE+Datascience.com- https://www.datascience.com

2. Research India Publication- http://www.ripublication.com

3. Akaash Vishal Hazarika, G Jagadeesh Sai Raghu Ram, Eeti Jain, Deegoju Sushma, Anju, Cluster Analysis of Delhi Crimes using Different Distance Metrics, International Conference on Energy, Communication, Data Analytics and Soft Computing (ICECDS- 2017).

4. Adel Ali Alkhaibari and Ping-Tsai Chung “Cluster Analysis for Reducing City Crime Rates”, IEEE Long Island Systems, Applications and Technology Conference (LISAT), 2017.

5. KM Archana Patel and Prateek Thakral, “The Best Clustering Algorithms in Data Mining”, International Conference on Communication and Signal Processing, April 6-8, 2016, India.

6. Jyoti Agarwal, Renuka Nagpal and Rajni Sehgal “Crime Analysis using K-Means Clustering”, International Journal of Computer Applications (0975 – 8887) Volume 83 – No4, December 2013.

7. Bavin Ondieki and Chaitanya Patchava, “Safe Path Recommender: Using Crime Statistics”, Stanford University.

8. Chhaya Chauhan, Smriti Sehgal, “A REVIEW: CRIME ANALYSIS USING DATA MINING TECHNIQUES AND ALGORITHMS”, 2017 International Conference on Computing, Communication and Automation (ICCCA2017).

9. Ren Jingbiao and Yin Shaohong, “Research and Improvement of Clustering Algorithm in Data Mining”, 2010 2nd International Conference on Signal Processing Systems (ICSPS).

10. Sunil Yadav, Meet Timbadia, Ajit Yadav, Rohit Vishwakarma and Nikhilesh Yadav, “Crime Pattern Detection, Analysis & Prediction”, International Conference on Electronics, Communication and Aerospace Technology ICECA 2017.

11. Moni Arora, Nisha Kaushik, Tanya Jain, Baljeet Kaur, Pooja Vashisth, Kamakshi Khosla, Suruchi Bhatia, “HumSafar: An Android App enabling a Safer Way to Travel", 2016 Fourth International Conference on PDGC.

12. LalithaSarojaThota, MohrahAlalyan, AL-OtaibiAwatif Khalid, FabihaFathima, Suresh BabuChangalasetty, Mohammad Shiblee, “Cluster based Zoning of Crime Info”.

13. Mark Robert M. Aldecimo, Marlene M. De Leon, “Development of an OpenStreetMap Based Safe zone Routing System for West Valley Fault Earthquake Disaster in the Makati Central Business District, Philippines”.

14. Richard Frank, Bryan Kinney, “How Many Ways Do Offenders Travel – Evaluating the Activity Paths of Offenders”, 2012 European Intelligence and Security Informatics Conference.

15. Yunkai Liu, Christopher Magno, “A Case Study to Apply Mobile Technology into Individual’s Local Community”, 2015 IEEE International Conference on Big Data.