CRIME PRONE AREA DETECTOR WITH MAPPING SERVICES USING CRIME DATA

A.Vidhya, K.Jayavarshan, G.Hariharran, J.Imthiyaz

[1] Assistant professor, Computer Science and Engineering, SRM Valliammai Engineering College,Tamil Nadu, India [2] Student, Computer Science and Engineering, SRM Valliammai Engineering College,Tamil Nadu, India
[3] Student, Computer Science and Engineering, SRM Valliammai Engineering College,Tamil Nadu, India
[4] Student, Computer Science and Engineering, SRM Valliammai Engineering College,Tamil Nadu, India

ABSTRACT

Crimes are increasing at a rapid rate , thus safety & security is becoming a major concern for us . While travelling, people should know whether the route is safe or not to travel from. People who are new to a place , have no idea about the safe routes of that particular region. Now a days people rely on google maps for planning their routes but it only provides the shortest path & doesn't provide any information on safer routes . There are several other route planning apps which provide the secured route, but do not consider all the factors that are responsible for safety of the path. Apart from other navigation apps, this paper describes an method to find secured route having lowest score. This paper uses updated crime and accident data available to determine average risk score of clusters/regions. Machine learning algorithms are used to generate the score of a path based upon average score of nearby clusters. Also, one can get better results by increasing the number of factors that affect the safety of the path. In future, a better prediction algorithm can be introduced through which traveler can identify probable crimes which he/she might face while travelling on a specific route.

Keyword: - *KNN K nearest Neighbor, Semantic Classification, Crime Data, Accidental Data, Clustering, Data Analytics;*

1. INTRODUCTION

Safety & security became the top most priority of every individual due to rapid increase in number of crimes all over the world. Even using google maps while travelling, may lead to life threatening & dangerous situations. Many women use different routes from those recommended by google maps & other similar apps due to the safety concerns. People who are native or local to that particular region might know which routes are safe to travel but people who are tourists or new in the city depend on their drivers or invest a lot of time in research about the safety of the area. To deal with such increasing issue related to safety, people need efficient solutions. These solutions that suggests safe route are becoming more important than it was ever before. With the help of such solutions, people will feel secured than before while travelling. Local government authorities are constantly collecting data related to crime offenses, accidents, routes etc. these datasets are constantly updated & maintained by the authorities & these are a great source of information. These information can be used to identify a particular area with high crime rate and frequency of crime occurrence.

1.1 Safe Route

There are applications that find the safest path by creating a balance between safety and distance. Safepath is one such application. . It uses a crime density map to assign risks to routes and then suggest routes that vary from shortest distance to safety. Another safe route application that was developed for Mexico City uses social crime

reports and tweets to do the classification and geocoding of crimes with the help of a Naive Bayes classifier . Its main aim is to find the safest route without considering the geographical distance. Similarly, SocRoutes uses geocoded tweets to suggest safe routes to the users and routes users outside an unsafe region. . Sentiment analysis is applied on the tweets and then the regions are categorized into safe and unsafe depending on the results of sentiment analysis. For suggesting the safest route, first the shortest path is found out and if the route passes through any region that is unsafe it shifts the points out of that unsafe region . In comparison to all these mentioned approaches which focus on crimes on a larger and greater scale, this proposed solution focuses on crimes at smaller level by using nested clustering. Work done previously on this topic either neglect crime areas that are smaller in size or use data which is highly subjective in nature..

2 EXISTING SYSTEM

Reference: Google maps

The existing system is the Google maps which works on the shortest path along with parameters like traffic load, source to destination route etc. Google maps uses Dijkstra's algorithm for finding the shortest route. It is a greedy approach in which google maps are visualized as a connection of vertices (nodes) and edges, wherein the distance between two nodes is already known as shown below. In this algorithm the adjacency matrix is created, and the cost matrix is created from the adjacency matrix. Then, starting from the source node all the nodes are visited to find the minimum cost of the path from source to destination.

2.1 DISADVANTAGES

Gives only the shortest path but not the safest one. It does not include security features and provides no intimation to the user before entering a crime prone area.

3. PROPOSED SYSTEM

The proposed solution for this ever–increasing problem focuses on - First: Predicting a safe route using crime and accidents data as well as considering distance between the source and destination. Second: Dividing the region in hand into smaller regions of risk by applying nested clustering on the data. It gives better predictions as it takes into consideration smaller crime areas also. Third: Calculating score of the routes based on the risk score of the nearby clusters. This solution focuses on predicting safest route by calculating score of all the routes lying between source and destination. The risk score of the paths are based on the average score of the nearby clusters formed using the datasets. The route with the lowest score is then suggested as the safest route. Sentiment analysis is applied on the tweets and then the regions are categorized into safe and unsafe depending on the results of sentiment analysis. For suggesting the safest route, first the shortest path is found out and if the route passes through any region that is unsafe it shifts the points out of that unsafe region. In comparison to all these mentioned approaches which focus on crimes on a larger and greater scale, this proposed solution focuses on crimes at smaller level by using nested clustering. An android application will be used to take the address of the place as the input from user. In addition, the age and gender of the user will be also taken as input. Also, the time will be taken as input from the android application. User will provide input in the form of two locations A and B respectively. From A to B there maybe multiple possible routes. Each route will have the precise navigation information as the street name and the distance to be travelled on that street. Each route may consist of one or more streets. Multiple possible paths will be analyzed for safety.

ARCHITECTURE DIAGRAM:

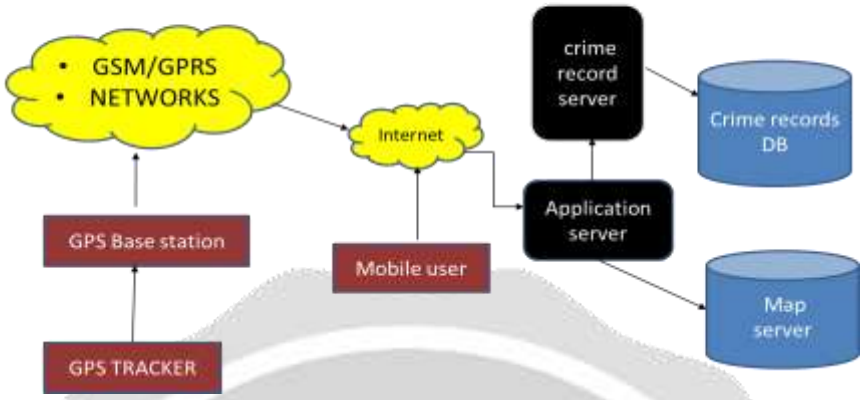
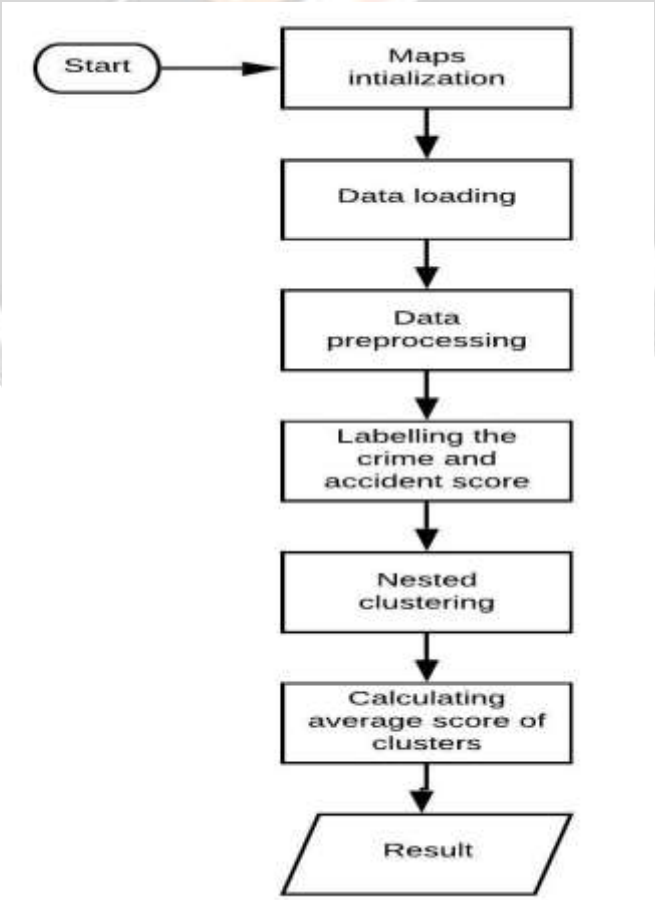


Chart -1: Implementation

3.1 HARDWARE AND SOFTWARE REQUIREMENTS

- Android Studio
- Mongo DB
- Node JS
- JDK



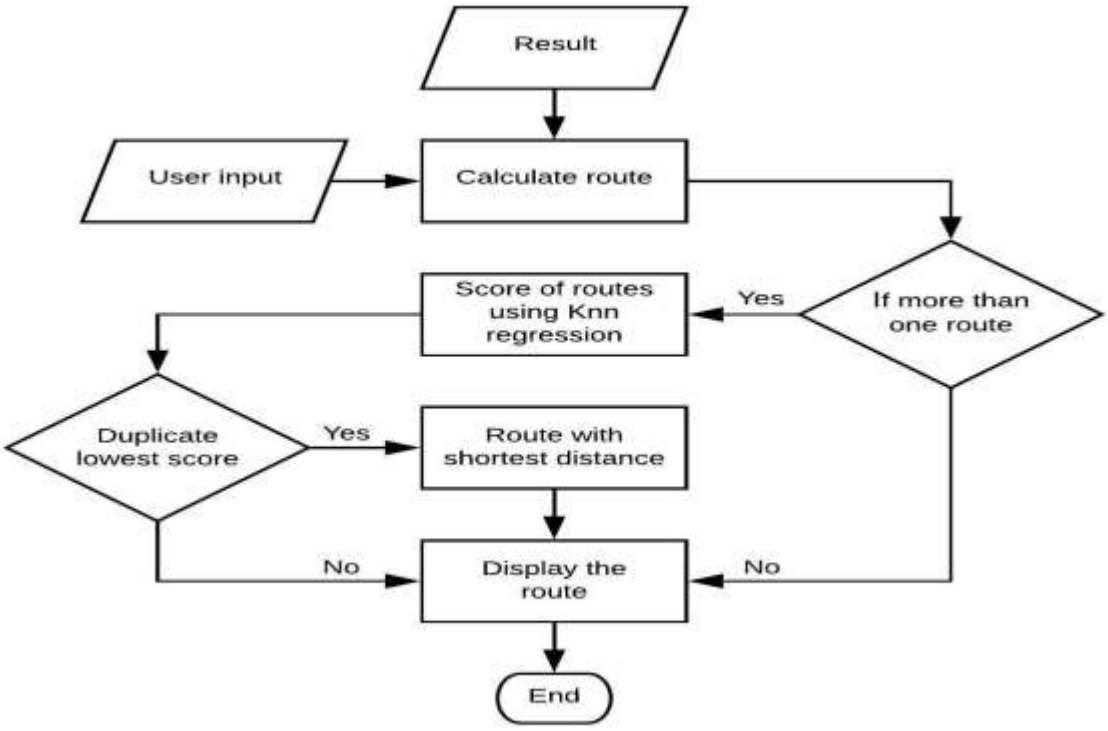


Fig -2: Block Diagram

4. CONCLUSIONS

In this paper, a solution is proposed that Gives people the path that is safest to travel from one place to another. Google API technology combined with models namely K Means clustering algorithm are used in this proposed solution. Arrest and accident datasets are used to predict the safest route. Google maps suggestion of the routes are purely based on the shortest distance, Safe path in this solution means route with lowest score & this is calculated based on accidents and crimes that happened on that route or in nearby regions. This solution is very useful especially for the people who are new to the city or are tourists.

5. REFERENCES

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