Research Paper Engineering

A Framework for Detecting Hotspots Using Clustering

* HarishKumar R , ** Sujatha R

* School of Information Technology and Engineering, VIT UNIVERSITY, Vellore, India

** School of Information Technology and Engineering, VIT UNIVERSITY, Vellore, India

ABSTRACT

: Due to the various social and economic conditions the crime rate is in the increasing phase. The need to alert and aware the people are very important at this juncture. The initiative step in this project is clustering the hotspots based on the already existing crime data of our city and same thing can be applied to all the places. Many clustering approaches have been utilized in the research work of crime mining. After making the analysis, we plan a framework for the same with novel clustering algorithm with the consideration of quality and performance point of view. In addition to the clustering plan to associate crime along with the various factors like unemployment, population etc. Clustering helps to trace the high level of crime prone area.

Keywords : crime, clustering, hotspot, framework, associationt

INTRODUCTION

Security and crime forecasting activities are most important concerns for both citizens and government. Crime is an integral part of risks. We are facing it in every day. Which are very harmful activities? Crime activities are spread throughout the world. In some of the places the crime activities are absent, which is not spread evenly in all the places. The crime activities have increased, but police department is the responsible for reducing and controlling the crime activities. Crime prevention and criminal identification are the major issues to the police department. The challenge activities are analyzing the crime and arrest the criminals. This is most difficult activity. The major disadvantage is, there are large number of data regarding crime activities and criminals, so we need better knowledge about the crime and criminals. The data about criminals will be stored in the database; these data will be available in all the police stations. The initiate step in this project is clustering the hotspots based on the already existing crime data of the city and same thing can be applied to all the places.

DATASET AND SURVEY:

Data mining in the study and analysis of criminology can be categorized into main areas, crime control and crime suppression. Crime control tends to use knowledge from the analyzed data to control and prevent the occurrence of crime. Data mining was used to automatically discover patterns and relationships in large databases. Crime detection and prevention techniques are applied to different applications ranging from cross border security, Internet security to household. This method also provided a visual clustering of criminal careers and identification of classes of criminals.

This article is based on information system (GIS), from the perspective of criminal cases described hot spots to study the spatial patterns of criminal cases, inspection hotspots geographic counting. The work is concentrated on finding hot spots of crime prone area. The proposed theory can identify hot spots of criminal cases to provide effective prevention and control of information support.

Big challenge here is here to collect the crime dataset. Initially there have lot of ideas to work with it. But due to the restriction of data system changes that scope up with data. Not only that Association Rule has to frame to point the reason behind the crime so socio factors need to be considered. Socio factor (population, unemployment..,) of location where crime occurred has to collect. These are the initial data we must have before proceeding to the system implementation. GIS tool need database to store the co-ordinates of location where crime occurred.

PRODUCT PERSPECTIVE

Earlier paper investigates crime patterns and hotspots in Beijing with GIS based techniques. The crime locations are projected on the map and their patterns are studied with Nearest Neighbor Index (NNI). The findings showed that crimes are not distributed randomly in space, but clustered as hotspots. Using Kernel density algorithm, the hotspots of the crime in space are identified, and the results are analyzed combined with the environment backcloth. The research in this article demonstrates that GIS could make great contribution to spatial crime risk analysis and prevention management.

In this system crimes are grouped into categories using clustering algorithm. DBSCAN is one of the finest density based clustering algorithm where it can able to identify in depth clusters also. We propose to optimize DBSCAN algorithm with improve performance and efficiency to identify the cluster just to make sure the identification of cluster (crime) must be clear. And for hotspot mapping, QuantumGIS an open source tool is used. It provide large functionality to make use, edit, change map depends upon user need. So that the map is clearer and more precise than those by the traditional methods.

WORKING MODEL

Step 1: The dataset is used to create the initial crime map.
Step 2: Where the crime locations produce the co-ordinates which is stored in a database will be copied to text file for further use.
Step 3: Text files when applied to the proposed algorithm it produce the core points.
Step 4: The core points works as the input to the hotspot function to produce the hotspot points.
Step 5: Then the hotspot point is used to create the new map were it contains the data of only high crime rate has been occurred.
Step 6: Associational rule will help to find some reasons behind the crime. We use some socio factors and crime dataset to produce an association rule.

CONCLUSION

This paper presents the method to identify the hotspot of crime. Based on the type of crime the police department can easily identify the hotspot of the crime. GIS is used to visualize the hotspot areas. Data mining concept is used to prevent and identify the crimes. Clustering technique is used to cluster the similar type of crimes together, based on the clusters' result the type of crime hotspot will be identified. This result will help to reduce the type crime. In future all type of crimes hotspot will be identified, through this the crime activities will be reduced. It could be concluded that crime data is increasing to very large quantities. This in turn is increasing the need for advanced and efficient techniques for analysis. As is the case with any other new technology, the requirement of such tool changes, which is further augmented by the new and advanced technologies used by criminals. All these facts provide the information that the vital research can be done in this area.

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