

Crime Rate Analysis And Detection Using Data Mining Techniques - A Survey

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Abstract- Day by day we are facing a large increasing crime rate in throughout world. Data Mining is the tool which provides examining large pre-existing databases and used to generate new information which may be essential. It allows to develop the intersection of machine learning patterns, statistics, and database systems. crime dataset based on frequents occurrence of those patterns they are used to help the decision makers of our security society to make a prevention action for the crime. Crime analysis is a part of criminology, which gives the a task that includes exploring and detecting crimes and their relationships with criminals. Providing the high accuracy in the crime systems is very much important need to detect the crime. In this paper we give a survey about crime rate preventing and detecting using the data mining techniques.

I. INTRODUCTION

1. Tracking patterns are One of the most basic techniques in data mining is recognize patterns learning in our data sets. This is a recognition of some aberration in where our data happening at regular intervals, or else an ebb and flow of a certain variable in over time. For example, we might see that sales of a certain product seem to spike just before the holidays, or notice that warmer weather drives more people to our website.
2. Classification is one of the more complex data mining technique which gives the forces us to collect various attributes together into discernable categories, which is help us to use then to draw further conclusions, or serve some function. For example, if we are evaluating data on individual customers' financial backgrounds and purchase histories, we might be able to classify them as "low," "medium," or "high" categorized credit risks. We could use these classifications to learn even more about those customers and dataset.
3. Association is technique which is related to tracking patterns, but is more specific to dependently linked variables. In this case, we look for specific events or attributes which are highly correlated with another event or attribute in the case. for example, we might notice that when our customers buy a specific item, they also often

buy a second, related item. This is used to populate "people also bought" sections of stores.

4. Outlier detection: In many cases, simply recognizing the overarching pattern can't give the clear understanding of the data set. We also need to be able to identify anomalies, or outliers in our collected data. For example, if our purchasers are almost exclusively male, but during one strange week in July, there's a huge spike in female purchasers, we want to investigate the spike and see what drove it, so we can either replicate it or better understand of our audience in the process.
5. Clustering is very similar to classify the data sets it involves grouping of data together based up on their similarities. For example, we might choose to cluster different demographics of our audience into different packets based on how much disposable income what they have, or how much they tend to shop at our store.
6. Regression is a technique which is used primarily as a form of planning and modeling, also used to identify the certain variable and then given the presence of other variables. For example, we could use it to project a certain price, based on other factors such as availability and consumer demand, competition. More specifically, regression's main focus is to uncover the exact relationship between two and more than two variables in a given data set.
7. Prediction is one of the most valuable technique in data mining. it's used to project the types of data in the future. In many cases it is just recognizing and understanding the historical trends is enough to chart a accurate prediction of the future. For example, we might review consumers' credit histories and also past purchases to predict whether they'll be a credit risk in the future of Collected data.

Crime analysis plays a role of solutions to the crime problems, and formulating the crime prevention strategies. Quantitative data analysis methods are the part of the crime analysis of the process, though out qualitative methods like examining police report and narratives also playing a role.

- Optimize the resources of the data and how they are deployed
- Monitor, measure and crime reducing.

- Improve the situational awareness by delivering the information to the data field where and when they needed.
- Improve budgeting and planning by knowing what's going to happen in tomorrow or next week or next month.

Crime analysis will occur at various levels, also including tactical, operational, and strategic. Crime analysts is a study of crime reports, arrests reports, and police calls for service to identify emerging patterns and series also trends as quickly as possible. They analyze these phenomena for all relevant factors, sometimes predict or forecast future occurrences, and issue bulletins, reports, and alerts to their agencies. They work with their police agencies to develop the effective strategies and tactics to address crime and disorder. Other duties of crime analysts are preparing statistics, data queries, or maps on demand also analyzing beat and shift configurations of preparing information for community. answering questions from the public and the press and providing data and information support for a police department.

II. LITERATURE SURVEY

"Crime Data Analysis Using Data Mining Techniques to Improve Crimes Prevention DR: ZAKARIA SULIMAN ZUBI, AYMAN ALTAHER MAHMMUD " [2014] In this research they will look at how to convert the crime information into a data-mining problem . it can help the analysis to identify crimes faster and help to make faster decision in the case. They have seen that in a group of crimes in a geographical region else in hot spot of crime. in data mining cluster is group of similar data points they can be a possible crime pattern in the case. The proposed model will be named as Mining Criminal (MLCR).Law enforcement agencies. Today we are faced a large volume of data they preprocessed and then transformed into useful information. Data mining can improve crime analysis and aid in reducing and preventing crime. They gives the study to explore the applicability of data mining techniques in the efforts of crime analysis and how to prevent them .More than 350 crime records that were used in their work can give estimation and lead to an acceptable model. WEKA and Excel software are used to analyze the collected crime and criminal datasets.

"PREDICTIVE MODELLING OF CRIME DATASET USING DATA Mining by PrajaktaYerpude and VaishnaviGudur Department of Computer Science, Illinois Institute of Technology, Chicago, Illinois[2017]" In this they use the MSE 0.0177, Accuracy 66.93 %, Precision 74 %, Recall 84.98 %, F1 score 86.6 %The paper concludes with

Random Forest Classifier giving the most balanced results with respect to accuracy, precision, recall and F1 score out of three models for prediction of 'Per Capita Violent Crimes' feature. While Linear Regression gave the lowest values in these performance measures, the data could not fit well to the straight line considered using target and remaining features. They have tested the accuracy of classification and prediction based on different test sets. Classification is done based on the Bayes theorem which showed more than 90% accuracy. Using this algorithm they trained numerous news articles and build a model. For testing they are inputting some test data into the model which shows better results. For getting better results in prediction they used to find more crime attributes of places instead of fixing certain attributes. They trained their system using certain attributes but they are planning to include more factors to improve accuracy. Their software predicts crime prone regions in India on a particular day. It will be more accurate if they consider a particular state/region.

"Data Mining Techniques used in Crime Analysis:- A Review Navjot Kaur Student (M.Tech), Department of Computer Science, GNDU Regional Campus Gurdaspur, Punjab, India[2016]". The findings revealed that total crimes in Kedah were mainly contributed by type of property crime (80-85%) while violent crime has a small proportion only. Fortunately due to the productiveness of the police the property crime trend indicated curve declining pattern. [3]Special section of the crime forecasting is considered in this case. The crime forecasting is used so that crime can be controlled. No specific location is considered in this case[13].

Review on Crime Analysis and Prediction Using Data Mining Techniques Dr.M.Sreedevi, A.HarshaVardhan Reddy, Ch.Venakata Sai Krishna Reddy[2018]", In this step they are collecting the data from various resources like new site, blogs, social media etc. .These collected data is stored into data base for future use and it is unstructured data. In this they can use Object Oriented Programming which is easy to use and flexible.

Classification: In this step they use Naive Bayes Algorithm which is supervised learning method. The algorithm classifies a news article into a crime type to which it fits the best. By using naïve-bayes classifier the main advantage is that it is simple, converges quicker than logistic regression. It works well for small amount of training to calculate the classification parameters .The concept of Named Entity Recognition(NER) is used to find and classify elements in text into predefined categories such as person names, organizations, locations etc.. by using this concept we can gather more information details about related crimes.

Pattern Identification: In this step we have to identify trends and patterns in crime for this step they are using Apriori Algorithm, it is used to determine association rules which highlight general trends in the database. In this step we identify the crime pattern for a particular place and corresponds to each location they take the attributes and predict some pattern to that particular place. When a new case comes it follows the same pattern and says that this area has a chance for crime occurrence. By using this pattern identification it will help to the police officials in an effective manner and avoid the crime occurrence in particular place by providing security, CCTV, fixing alarms etc.

III. CONCLUSION

Crime statistics gives the high level of crime rate in now days. In this case analysis and predict the crime in early stages are much needed one. Giving the correct information accuracy is helps to the police and other departments to detect the crime. Tracking the locations and also the patterns are used to give the information about the crimes which are happened by. Using more advanced data mining techniques and algorithm we can predict the society from the crime.

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