International Journal of Engineering & Technology, 7 (2.32) (2018) 424-426

International Journal of Engineering & Technology

Website: www.sciencepubco.com/index.php/IJET

Research paper



Enhancing the Performance of Crime Prediction Technique Using Data Mining

Dr.P.Raja Rajeswari[1], P.Surya Teja[2], P.Sri Harsha[3],T.Chaitanya Kumar[4]

[1,2,3,4]Department of CSE, KLEF, Vaddeswaram, Guntur Dt, Andhra Pradesh, India
**Corresponding author E-mail: rajilikhitha@kluniversity.in*

Abstract

Time is a important factor for criminal sentencing. Most of the times, criminal released on the bail which may harmful to the society, even after they have furnished the judgment. This sort of threats cut down through the prediction analysis. The analysis can be done on the concerned person to analyse that she/ he is about to do the crime. So that, its benefit not only for law enforcement but also for country safety. Data Mining, a method which handles a massive datasets. Data mining also used to guess desired patterns. Police Officers are the best persons for crime prediction and also predict the criminal's upcoming activities. We are here implementing the use of Frequent Mining Pattern in addition to Association Rule Mining. The main aim of this paper is analysing several crimes by various criminals and to predict chance of crimes by same criminal. It will be helpful for Country Law Enforcement and safeguarding from criminals who were released on Bail. Aim can be achieved with the help of Apriori Algorithm.

Keywords:*Prediction, Crime Analysis, Apriori Algorithm.*

1. Introduction

Now a days everything simple with the help of Technology. Therefore, which results in large and massive data. If we can use this in a right way, we are able to remove flaws that are existing. To discover hidden information in the massive amount of data, Data Mining concept will be introduced. This project proposed to predict criminal's forthcoming activities by processing criminal past behaviour from huge records. Existing System doesn't have any automated technology that can helps Police Department in prediction of crimes. They need to search individual records manually over massive data. Existing system also doesn't have the choice to identify potential criminals who are again planning to do same crime. This is the main problem with the Existing System. If we done this automatic, more time saving and easy. Using Apriori Algorithm in this system, we are overcoming all the drawbacks in previous system. Implementing Prediction technique with Rule Technique that will predict the Criminal's future planning crimes and individual criminal likely to perform in the future. This will also help seeking justice for people who did crime accidently. There is no full accuracy after implementing the project. This will depend on the Threshold values which are provided by the developer as per machine learning algorithms. We are concentrating on this system to provide more accurate (80%) results.

2. Existing Vs. Proposed System

Crime rate in India increasing rapidly. To reduce the crime rate in society and to speed up law system process, we are proposing a system to by finding Crime Patterns of concerned criminal. Challenged in Proposed system listed out below:

1. Structures used for storing massive Crime data.
2. Crime information/ data increasing size which have to be stored as well as analyzed.
3. Identifying and predicting techniques to analyse Large data.
4. Complicate analysis of Incomplete and inconsistent data.

2.1 Existing System

Accessing of any crime information done manually in the existing system. He/ she needs to dig up the files and search manually for a particular crime records.

1. Huge number of hard copies to be referred.
2. Time waste process since searching manually.
3. Lack of access of data anywhere.
4. Increasing crime rate, a big issue in India. Several systems proposed but lagging in identifying the area of crime.
5. It's a large data, previous systems unable keep all data/ files in single memory.
6. Massive Data Maintenance and storage is difficult.
7. Searching & predicting relevant data is not possible from huge records.

2.2 Proposed System

1. We are bringing this application to predict future crimes that criminals planning to do in future.
2. Guessing can be done based on attributes such as Education, Criminal Records, Occupation of criminals, friends circles, background of his/ her family, etc.
3. Here, storing of criminal previous records done. Through Mining criminal previous records, calculate possibility of crime and crime prediction as likely to perform can be done.

Copyright © 2018 Authors. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

3. Apriori Algorithm

Apriori algorithm, a best approach for the generation of recurring itemsets. In general, 2k-1 itemsets exclude the null sets which are generated for k items in a dataset. K generates large itemsets exponentially as the value of k is very large in the practical apps i.e., applications. Count support for the candidate itemset to find frequent itemsets. Best way for reducing number of candidate itemsets is implementation of Apriori Algorithm. It states that, " If an itemset is repeating; then its subsets must also be repeated".

Example:
Consider a itemset {1,3,4} as frequent, so all of the subsets are also frequent.

```
Apriori

Parameter specification:
 confidence minval smax arem  aval originalSupport maxtime support minlen
       0.01    0.1    1 none FALSE            TRUE       5   0.001      2
 maxlen target   ext
     10  rules FALSE

Algorithmic control:
 filter tree heap memopt load sort verbose
    0.1 TRUE TRUE  FALSE TRUE    2    TRUE

Absolute minimum support count: 0

set item appearances ...[0 item(s)] done [0.00s].
set transactions ...[68 item(s), 371 transaction(s)] done [0.00s].
sorting and recoding items ... [68 item(s)] done [0.00s].
creating transaction tree ... done [0.00s].
checking subsets of size 1 done [0.00s].
writing ... [0 rule(s)] done [0.00s].
creating S4 object  ... done [0.00s].
```

Fig 1. Parameter specification and support count for Apriori algorithm

Example:

Table 1. Transactions: Let us consider that the support threshold is 60%,to which the minimum support count is equivalent.
equal to 3. Apriori Algorithm is better than the Brute Force strategy performance. The production of Brute force candidates as follows

6C1 +6C2 +6C3 = 6 + 15 + 20 = 41
On the other hand ,Apriori produces
6C1 +4C2 + 1= 6 + 6 + 1 = 13

4. Implementation of Apriori Algorithm

Table 5.Crime Transactions

Assume that, support threshold is 60% that is equivalent to the minimum support count which is equal to 3.

Table 6, 7, and 8, Number of candidate itemsets is as follows:

6C1 + 4C2 + 1= 6 + 6 + 1 = 13

Frequent itemsets are: ({childAbuse}, {robbery}, {kidnapping}, {murder}, {childAbuse, robbery}, {childAbuse, robbery, murder}, {childAbuse, murder}, {robbery, murder}, {robbery, kidnapping})

5. Rules Generation

Rule mining with help of support in association with Confidence is nothing but Rule Mining.

Consider the expression X → Y; Here X & Y are disjoint datasets, Support figures how often a rule is applicable to the dataset & Confidence determines how usually the items in Y arrive in the transactions which contain X.

Support, S(X → Y) = support (X U Y) / N.

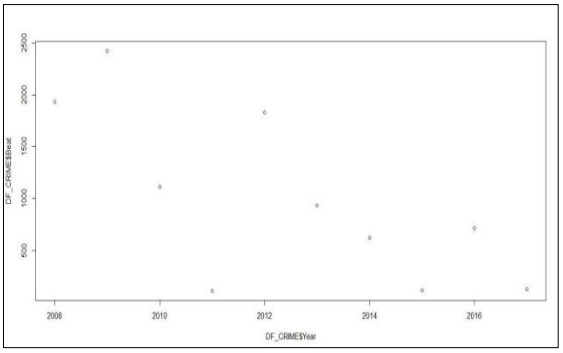
Confidence, C(X → Y) = support (X U Y) / support.
(X)

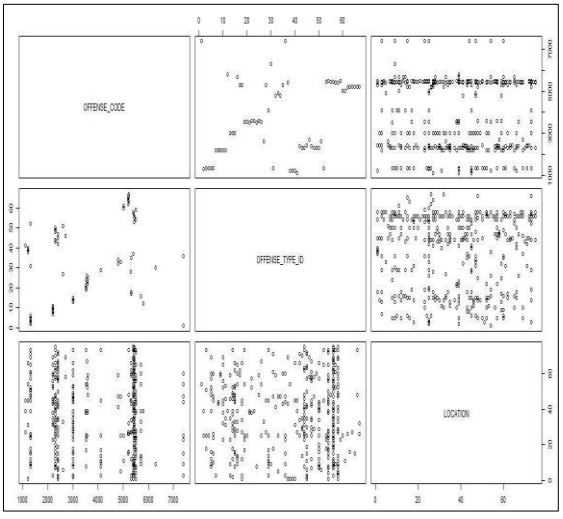
Assuming Confidence threshold C0 to be 80%, following 8 association rules is found:
1. If ChildAbuse then robbery
2. If ChildAbuse then murder
3. If robbery then murder
4. If murder then robbery
5. If kidnapping then robbery
6. If childAbuse then {robbery, murder} – 1 & 2 combined generates this rule
7. If {childAbuse, murder} then robbery
8. If {robbery, childAbuse} then murder

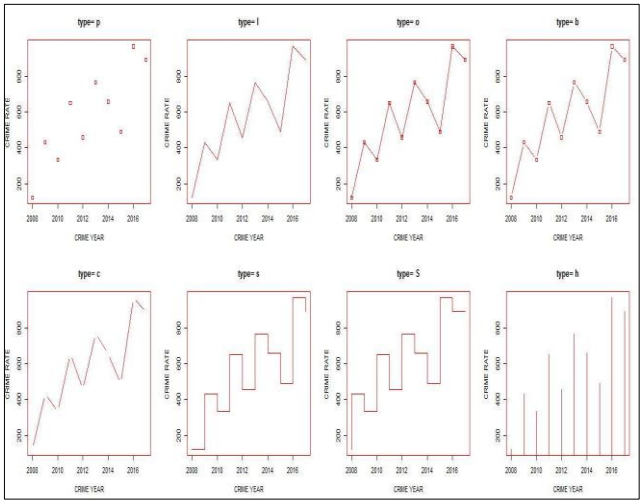
So, let's suppose if a query comes for criminal with id 3, our system will generate the output that the criminal may commit robbery in the near future.

6. Results

	OFFENSE_CODE	OFFENSE_TYPE_ID	LOCATION
1	5420	traffic-accident-dui-duid	cbd
2	5499	vehicular-eluding-no-chase	east-colfax
3	5312	disturbing-the-peace	athmar-park
4	5313	curfew	sunnyside
5	1315	aggravated-assault	college-view-south-platte
6	5016	violation-of-restraining-order	cheesman-park
7	5420	traffic-accident-dui-duid	villa-park
8	1313	assault-dv	cbd
9	2999	criminal-mischief-mtr-veh	globeville







In the above graph, the X-Axis will be represented for the Crime Year where as Y axis represents the Crime Rate for that Year. Results shown for Type= p/ i/ o/ b/ c/ s/ S/ h. Crime Rate represented from 2008 to 2016. With the help of Apriori Algorithm, the prediction of Crime Rate will be possible.

7. Some Other Areas

MEDICAL FIELD - This algorithm in the medical areas can be used to guess the particular patient disease through the evaluation of symptoms of patient. Therefore helps in predicting newly introduced symptoms, also the diseases which are prone to faced by others. With this, generation of interesting rules which will assume early diseases diagnosis.

BANKING SECTOR - Data Mining techniques & algorithms helps in the prediction of risk management and marketing as well as fraud of credit cards. Banks need more security since Fraud detection & prevention is difficult. Comparison of usual behavior patterns of customers with the statistical data of customers will detect the suspicious activity.

MARKETING RESEARCH - In marketing field, Association rules is powerful tool. Frequent itemsets generated using purchase patterns of customers. Rules generated bases on Itemsets with the help of Confidence. Early diagnosis done in marketing strategy with the arrangement of likely purchased products.

ENVIRONMENTAL HAZARDS - Here the Priori Algorithm deals with the Hazards of Environment. The technique helps to predict the Earthquakes, Tsunami, floods, etc. Disasters early prediction helps in saving properties as well as Lives. Prediction done based on Climatic conditions, textures of the terrains, etc., In this, present climatic conditions compared to the rules. So that, we can people to out of areas after the prediction of disasters.

EDUCATIONAL INSTITUTES - This algorithm also helpful in the field of Education. Apriori Algorithm used to understand Student Performance by their knowledge and Percentages. Therefore, enhances student performance implies improvement in curriculum quality.

8. Conclusion & Future Scope

In addition to present scope (Crime Prediction of a particular criminal that he/ she likely to commit in future), we can also go for time estimation of crime that will happen in future. Also, try the Location Prediction of Crime. By testing accuracy of frequent itemsets & prediction depending on the various test sets. Therefore, system will learn changing patterns of crime through crime patterns examination automatically. Sometimes, crime factors changes over the time. Going through Crime data, you can also explore new factors which leads to crime. We are considering only limited number of factors so it may not be accurate . Consider more crime attributes to get better results. Using Apriori Algorithm, we implemented the technique to predict crimes and safeguard the people from criminals who came out on Bail.

References

[1] "Enhanced Algorithm to predict the Future Crime using Data Mining" - by Malathi, Asst Professor (Post Graduate and Re-search department of CS, Government Arts College, Coimba-tore, India), Dr. S. Santhosh Babu Reader, (Post Graduate and Research Department of CS, D.G Vaishnav College Chennai, India-2011).

[2] "Crime Analysis with K-Means Clustering" by Jyoti Agarwal, [M.Tech CSE

[3] "Execution of Apriori Algorithm of Data Mining directed towards tumultuous crimes concerning Women", Divya Bansal, Lekha Bhambhu, J.C.D. College of Engineering and Technolo-gy, G.J.U. University of science and technology, India

[4] "Association Rule Mining & Frequent Pattern Mining Applications On Crime Pattern Mining - A Comprehensive Survey" by R Mani Bharathi, Dr K Duraiswamy, V.R. Sadashivam, K.S. Rangasamy College of Technology, Tiruchengode, India.

[5] "A Survey on Crime Data Analysis of Data Mining Using Clustering Techniques" by Shiju Sathyadevan, Devan M.S. Amrita Center for Cyber Security Amrita Vishwa Vidyapetham, Amrutapuri, Kerala, India Surya Gangadharan. Amrita Vishwa Vidyapetham Amrutapuri, Kerala, India-2014.

[6] "Data Mining Techniques to Analyze & Predict Crimes" by Yamuna S,V.Sudha Bhuwaneswari, M.Phil (CS) Research Scholar School of IT Science, Dr.G.R.Damodaran College of science Coimbatore 2 Associate Professor MCA, Mphil (cs), (PhD) School of IT Science Dr. G. R. Damodaran College of Science Coimbatore-2012.