

# Framework for crime analysis and detection by Pattern classification

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*Abstract:* Increasing advent of technological advancements, data analyst, working for maintaining law and order and investigation departments can help the Law enforcement officer to speed up the process of investigating crime cases. Thus, it seems necessary to study reasons, factors and relations between occurrence of different crimes and finding the most appropriate ways to control and avoid more crimes. Crime Information Report is an application made specifically for desktop purpose. This software provides certain ways of reporting crimes online, complaints, missing persons, shows details of most wanted persons, show snatchers, show unidentified dead bodies, stolen vehicles. Each user first makes their login to server to show their identity. This software provides the status of crime occurrence and gets the particular crime related information very easily which also result in time efficiency. The overall data will showed in the statically manner. To make crime reporting system more effective, an software system is developed to take the position, power and command of reporting and analysis crime in a way such that it will be useful to the Police and Public. The current authorization work on paper and pen approach by the use of this software paper work will reduce to the great extent. An online complaint registration system will be very helpful, which also helps police department catching criminals and taking appropriate actions.

*Index Terms* - : Crime Information Report: Crime, Survey, Statistics, Report, Data Analysis, Data Mining.

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## I. INTRODUCTION

CIR (Crime Information Report) is an platform for reporting crimes online. This can be really helpful for maintaining the records of crimes like FIR, details of criminals, number of crimes w.r.t any location, etc.

Modern society is evolved by increasing levels of worldwide social public mobility and dilemma relating to levels of risk projected by internal and external security threats. There is a known factor criminal justice is limited in its limitation to control which has led to many other approaches for approaching crimes and this has provided a market for private companies to push forward the growth of technological security and innovation. Crime is geographical and it can occur anywhere, anytime for any specific reason. There are various software to help criminal even as a commercial product. Thus the necessity for developing the software to control such unwilling disasters is increasing day by day. CIR is completely dependent on crime analysis. Almost 50% of the project lies on analysis of crime. Crime analysis can be defined as a task which includes investigation and identification of crimes and their relationship with criminals.

Reporting of crime has long been a influencer of news channels and coverage in free press platform, because stories of the crimes are usually news worthy. There are several reasons why people should report crime and why people want to read about crime:

Readers often want an description of why crimes happen. They ask: "Could it happen to me?" They may want to know so that they can avoid a similar thing happening to themselves. The readers need to know how laws are broken, and how people who break laws are caught and punished. This helps them to figure out what laws are and what the penalties for breaking them are. Some crimes may fascinate people who obey the laws but who wonder what it might be like to break them. Criminals take risks and face punishment if they are caught. This may make them appealing to read about.

## II. PROBLEM STATEMENT

Crime is the part of human pursuit and need to be supervised. No human civilization has ever been totally free from crime nor it will be completely. The more inhabited society will become more composite and compound crimes will be generated. Thus the more control over disruptive society is desired. To enhance the crime reporting system, an online system is developed to fully take the responsibility of reporting crime in a way that will be useful to police and public. For a instance, in cases which involve property type of crime the report can include units like:

- Illustration and Classification of the crime (article).
- Its amount and valuation.
- Category of Loss (e.g., Stolen, Fraud).
- Category of Victim (e.g., individual, business).
- Spot of crime.

Many Criminals have high knowledge of technology which also tends to increase in online crimes such as cyber-crime, unauthorized access to Banks servers and many others.

According to the survey the hardest stage in crime investigation process is to gather information concerning crimes. The system what we are using has the following basic limitation:

- Requires more man power.
- Time Consuming.
- Less user friendly.
- Need many manual processes and calculations.

### III. EXISTING VS PROPOSED SYSTEM

Crime in India is increasing predominantly. Finding out the crime pattern will be very helpful to speed up the process of law procedures and reduce crime in society.

Following are the challenges and Ideas to this proposed project:

- i. Analysis and Storage of ever increasing crime information.
- ii. Difficulties of finding out the techniques to analyze this data.
- iii. Methods and Data Structures to be used for storing crime related data.
- iv. The Incomplete and Inconsistence data complicates

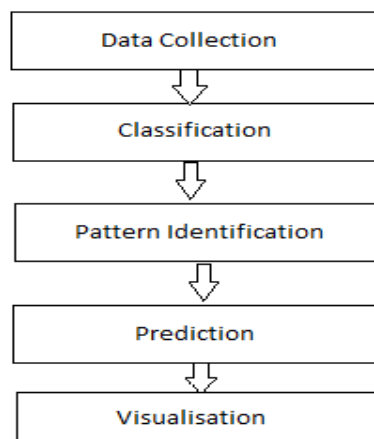
#### 1. Existing System :

For accessing any information we need to find out data manually by digging in again and again for concrete and related information. There are lots of entities required for searching which results in unnecessary time consumption.

There are lots of copies which is required to refer various cases. The increase in number of crime is a big issue which is needed to be resolved. There are lots of system which is already developed but no system can accurately predict the crime area.

#### 2. Proposed System :

- The Proposed system is an application which can be helpful in predicting the crimes that a criminal can do in future.
- This prediction can be based on the various attributes like criminal record, education, occupation, friend circle, family and family background and various other factors.



*Figure. Data Flow Diagram for Proposed Plan*

The model will store all the historical data of the criminal and with the help of data mining of complete previous data, the prediction phases will be calculated.

#### IV. DATA MINING

Data mining plays an essential role in terms of prediction and analysis. Data mining is a process of gathering knowledge from huge amount of data stored in databases, data warehouses and data repositories. Crime analysis is the activity in which interpretation is done on crime activities. Today criminals have extreme use of all modern technologies and hi-tech methods in committing crimes. It is impractical to find a country which has a crime-free society. As long as human beings have feelings they incline on attempting crimes. So the present society has also filled with different kinds of crimes. Hence, formation of data base for crimes and criminals is needed. Developing a good crime analysis tool to recognize crime patterns quickly and efficiently for future crime pattern identification is challenging field.

Crime evaluation and anticipation is a fastidious approach for recognize some trends in crime and the crime data analysts can help the Law enforcement officers to speed up the process of solving crimes. The Data mining is worried with the automatic discovery of patterns and relationships in large databases and also using this concept of data mining we can withdraw earlier unknown data and useful information from an unformed data. And using this data mining process solve the crime faster.

Crime and criminal behavior, counting crimes or drug trafficking, can be categorized and modeled. Hence, crime can be separated into multiple types, such as crime against property (theft, burglary and robberies) and the crime of aggression (murder, assault and rapes). Using the idea of data mining, the system can foresee regions of high chances for crime occurrence and visualize crime-prone areas. Data mining can be used to model crime awareness problems. Crimes are a social inconvenience and cost our society dearly in many ways. Some analysis that can help in crimes faster will pay for itself. Approx. 10% of the criminals commit about

49% of the crime. Crimes diverge in nature widely and crime database often contains several unsolved crimes. Also nature of the crime changes over period of time. Analyze crime to have an objective means to access crime problems in locals, regional, national within and between law enforcement agencies.

#### V. CLUSTERING ALGORITHM

Clustering is the automatic learning technique in which division of the data elements into groups of similar objects takes place. There are various clustering methods which is helpful to implement the various mining ideas, Partitioning method is one of them which include **k-means method** or **centroid based method**.

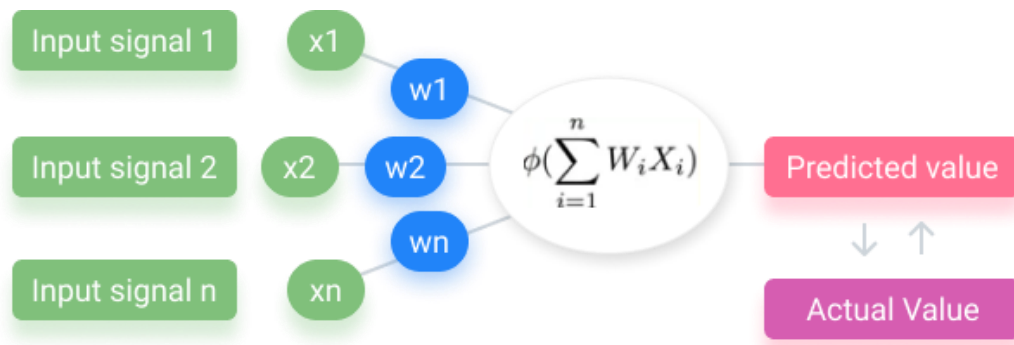
- **k – means Method :**

The k-means algorithm the cluster k is produced by taking various input parameters and by partitioning a set of n objects such that inter-cluster is minimum and intra-cluster is maximum. The k-means method works as:

k objects are selected randomly, each object is identified as cluster mean or center. The difference between cluster and the object is assigned to the main cluster k. This complete methods repeats again and again until the criterion function is meet. The aim of the algorithm aims at minimizing an objective function which is known as squared error function given by:

$$J(V) = \sum_{i=1}^c \sum_{j=1}^{c_i} (\|x_i - v_j\|)^2$$

where, ' $\|x_i - v_j\|$ ' is the Euclidean distance between  $x_i$  and  $v_j$ .  
' $c_i$ ' is the number of data points in  $i^{\text{th}}$  cluster.  
' $c$ ' is the number of cluster centers.



#### A Procedure for k-means Algorithm :

- Step 1: Choose K random datasets for cluster as initial group.
- Step 2: For point 'p' in the dataset assign to the cluster which is nearest center.
- Step 3: Again calculate the positions of the centers.
- Step 4: If change in the positions of the centers are found go to step 2 else go to next step.

#### VI. FUTURE SCOPE

Future scope of the CIR includes the implementation of online Data Base which will be useful to implement when the project is on air. The future Scope also include the Platform independence feature where the same CIR project will also be available for various platforms like Android, Linux, iOS, etc.

Multilingual access can be provided so that it can be understandable by the person of any tongue. More interactive it can be made by making it more user-friendly and effective with the help of GUI. Manage & store backup versions of documents online

#### VII. CONCLUSION

So after complete the survey, we came to the conclusion that in the modern world of innovation & modernization there is need of CIR for awareness of public. This will be beneficial in many aspects. This application used for transforming the raw data into meaningful & crucial information which helps in forming decisions support system .If the number of grievances from any state is found to be extreme high, extra security must be provided to the resident people by increasing police protection. This application is very useful for investigation agencies also in taking necessary steps to reduce crime.

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