

WORLD - NET BASED CRIMINAL NETWORKS MINING FOR CYBER CRIME INVESTIGATION

Prabavathi A¹, Reshma V², Saradha K³, Kalaivani S^{4*}

^{1,2,3}UG Scholar-Dept.CSE, GRT Institute of Engineering & Technology, Tiruttani, India.

^{4*} Assistant Professor-Dept.CSE, GRT Institute of Engineering & Technology, Tiruttani, India.

prabapravathi502@gmail.com, reshcse006@gmail.com,

saradhachowdhary416@gmail.com,

*Corresponding Author: kalaishan@gmail.com

Abstract

Nowadays crime rate is frequently increasing day by day in our society. Crime is part of human activities and needs to be managed. No human society has ever been totally free of deviants and it is unlikely that society will ever be. The project is aimed to develop a web based application in which a common user can report online crimes, complaints, missing persons, show most wanted person details, show snatchers, show unidentified dead bodies, stolen vehicles. Any number of clients can connect to the server. Problem was that people got tired by going here and there for getting justice. So our application is capable of registering online, shows investigation update, deliver news about crime etc. So it is an application which provides solution to the problem faced during taking actions against crime.

Keywords : *Data mining , Crime Details, Cyber Crime Investigation , Fingerprint.*

1. Introduction

Crime evokes a wide variety of reactions in people fear, anger, fascination, curiosity. An introduction to crime and criminology, we have considered the relatively common-place problem of vandalism in the form of graffiti as one example through which to explore your own views about an everyday sort of crime. We were also invited to consider how social scientists and criminologists, in particular, study and seek to understand problems of crime. Finally, We were introduced to the idea of the

criminological imagination. This, in part, involved viewing criminological issues or problems from multiple perspectives but also suggested that private troubles and social issues are often linked together.

2. Related Work

Since there are many intricate components that go into committing a crime, predicting crime is difficult. The vast quantity of regular crime occurrences in many locations makes crime prediction increasingly difficult. Despite the abundance of well-established machine learning and deep learning techniques, law enforcement officials still struggle to stop crimes before they happen. To reduce crime rates, law enforcement must be done effectively. Using deep learning techniques, this research suggested an efficient multi-module solution for crime prediction. The two elements of our suggested approach are called Decision Level Fusion and Feature Level Fusion. Temporal-based Attention LSTM, Spatial-Temporal based Stacked Bidirectional LSTM, and Fusion model are used in the first module. LSTM is a recurrent neural network architecture in deep learning. The training data from the first two models is utilized by the Fusion model. The source model for the transfer is the temporal-based model [1].

Predicting crime risks is essential to both city safety and the standard of living for citizens. However, predicting crime risk in

cities is difficult without labelled data. Obtaining high-quality tagged crime data is not easy for many places because of maintenance costs and municipal rules. Specifically, some cities may have limited labelled data, while others may have a large amount. By gaining information from a city with an abundance of data, it has proven feasible to create a crime prediction model for a city lacking labelled crime data. Nevertheless, this prediction task is made more difficult by the inconsistent relevant context data between cities. In order to do this, this paper addresses the inconsistent contexts and suggests an efficient unsupervised domain adaptation model (UDA) for crime risk prediction across cities. UDA is a transfer learning technique utilized in deep learning. [2].

Crime prediction is an essential tool in crime prevention, helping law enforcement agencies choose the best patrol approach. Different methods and techniques have been applied to forecast criminal behaviour. However, the landscape and composition of data used to predict crime are dynamic. There has been a notable increase in the use of social media platforms for information and idea sharing. Particularly Twitter is thought to be a useful tool for gathering opinions, viewpoints, and public attitudes. To this end, methods for assessing the tone of tweets on Twitter have been devised in order to determine if the text presents a favourable or unfavourable opinion about a crime incidence. One important method for combining the data from tweets and criminal sources is data fusion [3].

The infrastructure of smart cities has a big influence on raising people's standards of living. But in recent years, there has been a significant growth in the population living in cities, which presents problems with resource management, security, and safety. This study offers a revolutionary strategy for ensuring safety and security in smart city environments. It gives the authorities the ability to more effectively depict dangers by

locating and forecasting the high-crime areas in the city. In order to achieve this, it looks at the Hierarchical Density-Based Spatial Clustering of Applications with Noise in order to identify hotspots that are more likely to see criminal activity. Second, Seasonal Auto-Regressive Integrated Moving Average is used in each location with a high crime rate to anticipate the total number of crimes [4].

Crime and infractions are intended to be managed because they pose a threat to justice. Computationally, accurate crime prediction and future trend forecasting can help to improve urban safety. The inability of humans to comprehend complicated information from large amounts of data makes it difficult to anticipate and predict crime in an early and accurate manner. Numerous computational opportunities and challenges arise from the precise calculation of the crime rate, types, and hot locations based on historical patterns. Even with extensive research, a more accurate predictive algorithm is still required to guide police patrols toward illegal activity. The accuracy of crime forecasting and prediction based on learning models has not been attained in previous studies. Thus, various machine learning techniques were used in this work, including logistic regression, support vector machine, Naive Bayes, and k-nearest [5].

3. Objective

The main objective is to reduce the trouble of going to police station frequently. It also reduces the man power while taking action against crime. It also helps to get the information about the crime easily. The main aim of this project is to secure and make privacy on crime related data over manually data storage.

4. Proposed System

The main idea is to implement an automated software application for maintain the proper

common people complaints of different issues to the police departments. By using this application people who are afraid or don't have enough time to go police station for complaints about their personal legal issues, or any kind of issues, here they can give their complaints through online to register any type of complaints. Verification of permitted users is done by entering the valid & authorized user's entry on login page. User can add online complaints and also they needs to attach the proof of regarding issues as a text and also can anytime check the complaints status. And when other police station require any criminal information at that time they don't need to call that police station . They also check others police station database with their permissions..

Advantages: Citizens don't need to go police station to see the criminal's information, they can directly see information on site, Visitor can easily get the information about the crime and criminal, reduce the man power, and also reduce the time, and Member can view the current status of the criminal.

5. Architecture Diagram

User can register their complaints through this application. Initially, User has to register using their personal details and then login and complaint after getting otp. Police can see the complaints and they decided whether it would be rejected or approved. After the complaint is registered they will be investigate using Location, Fingerprint and other parameters.

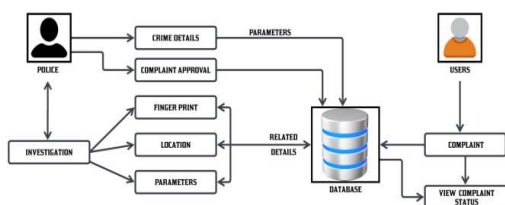


Fig: 5.1 Architecture Diagram

6. Algorithm

AHO-CORASICK ALGORITHM

Aho–Corasick algorithm is a string - searching algorithm. It is a kind of dictionary-matching algorithm that locates elements of a finite set of strings within an input text. It matches all strings simultaneously. The complexity of the algorithm is linear in the length of the strings plus the length of the searched text plus the number of output matches. Note that because all matches are found, there can be a quadratic number of matches if every substring matches.

Steps

Pre-processing: Build an automaton of all words in arr[] the automaton has mainly three functions:

1. We first build a Trie (or Keyword Tree) of all words.
2. This part fills entries in goto g[][] and output o[].
3. Next we extend Trie into an automaton to support linear time matching.

7. Implementation

7.1. Updating Crime Details Module

With the introduction of biometrics technology which is an advanced computer techniques now widely adopted as a front line security measure for both identity verification and crime detection, and also others an effective crime deterrent. Whenever the crime is occurred the initial investigation is done by the police. Police records all the details such as location, date and time of crime, criminal's details such as height, weight, fingerprint etc.

7.2. Crime Investigation Using Image Module

A fingerprint is the feature pattern on the finger. It is proved through strong evidences

that each fingerprint is almost unique in nature. Each individual retains his own fingerprints with the permanent and durable uniqueness. Hence fingerprints are being adapted for identification and forensic investigation. So police can start the investigation by using the finger print from the crime location. The fingerprints images can be compared with the datasets can also find the criminals.

7.3. Crime Investigation Using Location Module

Crime scene management skills are an extremely significant task component of investigation because evidence that originates at the crime scene will provide a picture of events for the court to consider in its deliberations. The value of collecting evidence from location has been well established over the last several years. Location evidence has played a major role in several high profile cases ranging from terrorism homicide to kidnapping. The location in which crime has occurred will be updated in the database and further will be investigation using location.

7.4. Investigation Search Using Other Features And Parameters Module

The criminals features such as their height, weight, biometric images etc will be updated in the database, birth mark and also hair structure. All the features and parameter which gathered from the location will be compared with the previous datasets.

8. Experimental Result

This result discusses about the implementation of the world-net based and criminal networks mining using cybercrime investigation using data mining for various cases are identified and the below Fig 8.1 shows the implementation of the starting of our application, 8.2 shows the crime details in particular location to police and Fig 8.3

shows the details of crime based on the input of fingerprint or any images.



Fig: 8.1 Home Page

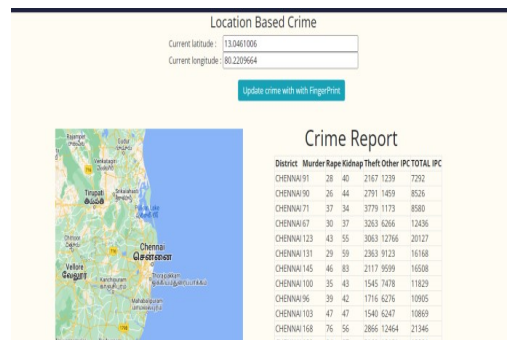


Fig: 8.2 Location based search

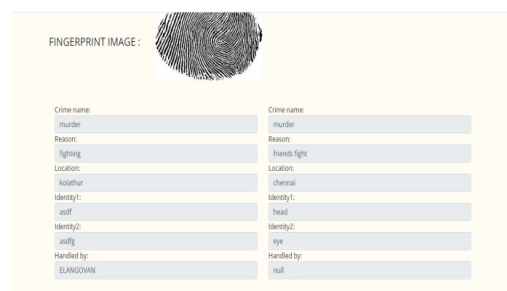


Fig: 8.3 Fingerprint Based Search

9. Conclusion & Future Work

This application is made to work proficiently and viably. It results in customary and auspicious activity against wrong doing detailed. It tends to be seen that the data can be acquired effortlessly and

precisely. It should likewise lay the better correspondence, diminishing wrongdoing and whole working less tedious. By utilizing this application individuals who are apprehensive or don't have enough time to go police headquarters for grievances about their own legitimate issues, or any sort of issues, here they can give their dissensions through online to enlist any kind of protests.

The clustering technique identifies significant crime patterns that can help both in criminology and criminal justice industry. Three different aspects of crime performed against women in India are brought into light by this experimental research work. We have labelled the clusters according to the most frequent context word, but it may happen that some of the context words existing in the cluster do not reflect the same crime aspect as the label of the cluster.

In that case, we can collect the context words defining the same meaning. This task is known as paraphrase extraction which is considered as a future work. The paraphrase extraction can significantly improve the relation labelling scheme. Apart from the chosen domain of entity pairs, other different domains can also be considered as future research work. This method can also be applied on general datasets. Improvisations in the methodology will further provide a vast description of crime related activities by exploring other aspects of crime pattern analysis and eventually it will help the law enforcement agencies to analyze crime at a faster pace.

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