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## **ABSTARCT**

A crime is a deliberate act that can cause physical or psychological harm, as well as property damage or loss, and can lead to punishment by a state or other authority according to the severity of the crime. The number and forms of criminal activities are increasing at an alarming rate, forcing agencies to develop efficient methods to take preventive measures. In the current scenario of rapidly increasing crime, traditional crime-solving techniques are unable to deliver results, being slow paced and less efficient. Thus, if we can come up with ways to predict crime, in detail, before it occurs, or come up with a “machine” that can assist police officers, it would lift the burden of police and help in preventing crimes. To achieve this, we suggest including machine learning (ML) and computer vision algorithms and techniques. In this paper, we describe the results of certain cases where such approaches were used, and which motivated us to pursue further research in this field.

## **CHAPTER 1**

### **INTRODUCTION**

Day by day crime data rate is increasing because the modern technologies and hi-tech methods are helping the criminals to achieve the illegal activities. According to Crime Record Bureau crimes like burglary, arson etc have been increased while crimes like murder, sex, abuse, gang rap etc have been increased. Crime data will be collected from various blogs, news and websites. The huge data is used as a record for creating a crime report database. The knowledge which is acquired from the data mining techniques will help in reducing crimes as it helps in finding the culprits faster and also the areas that are most affected by crime.

Data mining helps in solving the crimes faster and this technique gives good results when applied on crime dataset, the information obtained from the data mining techniques can help the police department. A particular approach has been found to be useful by the police, which is the identification of crime 'hot spots' which indicates areas with a high concentration of crime. Use of data mining techniques can produce important results from crime report datasets.

The very step in study of crime is crime analysis. Crime analysis is exploring, inter relating and detecting relationship between the various crimes and characteristics of the crime. This analysis helps in preparing statistics, queries and maps on demand. It also helps to see if a crime in a certain known pattern or a new pattern necessary. Crimes can be predicted as the criminals are active and operate in their comfort zones. Once successful they try to replicate the crime under similar circumstances. The occurrences of crime depend on several factors such as intelligence of criminals, security of a location, etc

The work has followed the steps that used in data analysis, in which the important phases are Data collection ,data classification, pattern identification, prediction and visualization. The proposed framework uses different visualization techniques to show the trends of crimes and various ways that can predicts the crime using machine learning algorithm. The inputs to our algorithms are time (hour, day, month, and year), place (latitude and longitude), and class of crime:

- Act 379 - Robbery
- Act 13 – Gambling
- Act 279 - Accident
- Act 323 - Violence
- Act 302 - Murder
- Act 363 - Kidnapping

The output is the class of crime that is likely to have occurred. We try out multiple classification algorithms, such as KNN (K-Nearest Neighbors), Decision Trees, and Random Forests. We also perform multiple classification tasks – we first try to predict which of 6 classes of crimes are likely to have occurred, and later try to differentiate between violent and non-violent crimes.

## CHAPTER 2

### LITERATURE SURVEY

#### **An Exploration of Crime Prediction Using Data Mining on Open Data**

It was authorized by “Ginger Saltos and Minhaela Cocea”.

Crime data has been systematically recorded by the police for many years and in the last decades, there has been a surge of Open Crime Data and of apps or web based application displaying crime statistics on maps, both by official sources, such as from police UK, and other sources using the same official data. In this paper investigate predict many types of crime and discuss their applicability.

Prediction of crime can be done by the methods such as crime prediction, Data mining, open data, regression, decision trees, instance based learning. The experiments were conducted using the SCIAMMA High Performance Computer Cluster at the University of Portsmouth and the Weka software.

#### **Crime Analysis and Prediction Using Data Mining**

It was authorised by Shiju Sathyadevan, Devan M.S, Surya Gangadharan.

According to the Crime record Bureau crimes like burglary, arson, etc have been decreased while crimes like murder, sex, abuse, gang rap etc have been increased. In this paper data's are collected from various sources like websites, blogs, news sites, social media, RSS feeds etc. This huge data is used as a record for creating a crime record database. The crime analysis using five steps they are Data Collection, Classification, Pattern identification, prediction, and Visualization.

It can be done by using methods such as Naïve bayes, Apriori algorithm, Decision tree, NER, Mongo Db, GraphDBs. This paper has 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.

#### **Crime Detection Techniques Using data Mining and KMeans**

It was authorised by Khushab u A.Bokde, Tisksha P. Kakade, Dnyaneshwari S. Tumsare, Chetan G. Wadhai .

This paper is mainly focusing on crime Analysis, Clustering and Clustering by Kmeans algorithms methods. some of the purpose of crime analysis are

Extraction of crime patterns by crime analysis and based on available criminal information, crime recognition. Clustering means Division of a set of data or objects to a number of clusters. There by cluster is composed of a set of similar data which have same as a group. K- means is the simplest and most commonly used partitioning algorithm among the clustering algorithms in scientific and industrial software.

It can be done by using methods such as Crime, Clustering , K-Means Algorithm. From the accuracy result, crime data mining has a promising future for increasing the effectiveness and efficiency of criminal and intelligence analysis.

### **Survey on crime analysis and prediction using data mining techniques**

It was authorised by Benjamin Fredrick David. H and Suruliandi

Criminology is process that is used for identify the crime characteristics and crime identify. By using this data mining algorithms will be able to produce crime reports and help in the identification of criminal much faster than any human could. The criminals when leaving the crime scene does leave some trace which can be used as clue to identify the criminals .This process is used to identifying the criminals based on the clues or information given by the local peoples. in this paper using some criminal analysis methods they are Text, content and NPLbased methods, Crime patterns.

It can be done by using methods such as Criminology, Crime Analysis, Crime Prediction , Data Mining. The quantitative analysis produced results which shows the increase in the Accuracy level of classification because of using the GA to optimize the parameters.

### **Crime Pattern Analysis, Visualizations And Prediction Using Data Mining**

It was authorised by Tushar Sonawane, Shirin Shaikh,Shaista Shaikh, Rahul Shinde, Asif Sayyad.

Crime analysis is exploring, inter relating and detecting relationship between various crimes and characteristics of crimes. The main aim of this research paper consists of developing analytical data mining methods that can systematically address the complex problems related to various form of crime. From this literacy study, it could be concluded that crime details increasingly to very large quantities running into zeta bytes.

It can be done by using methods such as K-Means, Cluster, Correlation . Result will be in the form of correlation between various crime and location of crime. crime can also be correlated on the basis of age ,group, location of crime & type of crime.

### **Crime Analysis And prediction using Data Mining Techniques**

It was authorised by Rajkumar .S, Sakkarai Pandi.M, Soundarya Jagan.J,V arnikasre e.P

Main contribution of this paper is to propose a new approach based on deep learning success in different classification task such object detection image recognition natural image processing and dimensionality reduction deep learning algorithms use deep architectures of multiple layers to extract features from raw data.

It can be done by using methods such as Data mining, machine learning, crime analysis, crime prediction. Analyzed and compared different algorithm on crime data determine which algorithm performs better of crime prediction. The results of this result may help new potential users in understanding the range of available crime data mining technologies and technologies.

### **Systematic Review of Crime Data Mining**

It was authorised by Sapreet kaur, Dr. Williamjeet Singh.

This paper is explains techniques used, challenges addressed, methodologies used, and crime data mining and analysis paper. The methodologies is composed of three stages the first stage involves the research work related to crime data mining, second stage is concerned with establishing a classification and the third stage is involves the presentation of summary of research in crime data mining and analysis and report of this survey.

It can be done by using methods such as Crime data mining, crime data analysis, systematic review, systematic study. The results of this result may help new potential users in understanding the range of available crime data mining technologies and technologies.

## **Survey paper on Crime Prediction using Ensemble Approach**

It was authorised by Ayishesh im Almaw, Kalyani kadam.

Different classification algorithm in problem resolving are nominated based on the suitable requirements in crime data prediction.

One technique may provide better accuracy value than different techniques which are nominated for solving the particular problems .Some papers introduced combined different models to achieve better performance which overcome the individual models to achieve better performance which overcomes the individual models called ensemble learning.

It can be done by using methods such as Crime prediction, naïve Bayes, J48,Artificial network. A Survey is conducted so that crime forecasting can be improved by the use of efficient data collection and data mining strategies.



## **CHAPTER 3**

### **EXISTING SYSTEM**

After finding and understanding various distinct methods used by the police for surveillance purposes, we determined the importance of each method. Each surveillance method can perform well on its own and produce satisfactory results, although for only one specific characteristic, that is, if we use a Sting Ray, it can help us only when the suspect is using a phone, which should be switched on.

Thus, it is only useful when the information regarding the stake out location is correct. Based on this information, we can see how the ever-evolving technology has yet again produced a smart way to conduct surveillance. The introduction of deep learning, ML, and computer vision techniques has provided us with a new perspective on ways to conduct surveillance.

### **PROPOSED SYSTEM**

The main reason for the change in crime detection and prevention lies in the before and after statistical observations of the authorities using such techniques. The sole purpose of this study is to determine how a combination of ML and computer vision can be used by law agencies or authorities to detect, prevent, and solve crimes at a much more accurate and faster rate. In summary, ML and computer vision techniques can bring about an evolution in law agencies.

Crime forecasting refers to the basic process of predicting crimes before they occur. Tools are needed to predict a crime before it occurs. Currently, there are tools used by police to assist in specific tasks such as listening in on a suspect's phone call or using a body cam to record some unusual illegal activity. Below we list some such tools to better understand where they might stand with additional technological assistance.

## SYSTEM ARCHITECTURE

- Data Gathering
- Data Preprocessing
- Choosing model
- Training model
- Testing model
- Tuning model
- Prediction

## SYSTEM REQUIREMENTS

### HARDWARE REQUIREMENTS

- System : Pentium Dual Core.
- Hard disk : 120 GB.
- Input devices : Keyboard,Mouse.
- Ram: 4 GB

### SOFTWARE REQUIREMENTS

- Operating system: Windows 7/10.
- Coding Language :Python

## MODULES

- Data Gathering Module
- Data Preprocessing Module
- Feature selection Module
- Building and Training Model
- Prediction Module
- Visualization Module

### **Data Gathering Module:**

Crime dataset from kaggle is used in CSV format.

### **Data Preprocessing Module:**

10k entries are present in the dataset. The null values are removed using `df = df.dropna()` where `df` is the data frame. The categorical attributes (Location, Block, Crime Type, Community Area) are converted into numeric using Label Encoder. The date attribute is splitted into new attributes like month and hour which can be used as feature for the model.

### **Feature selection Module:**

Features selection is done which can be used to build the model. The attributes used for feature selection are Block, Location, District, Community area, X coordinate , Y coordinate, Latitude , Longitude, Hour and month.

### **Building and Training Model:**

After feature selection location and month attribute are used for training. The dataset is divided into pair of xtrain ,ytrain and xtest, y test. The algorithms model is imported from sklearn. Building model is done using model. Fit (xtrain, ytrain).

### **Prediction Module:**

After the model is build using the above process, prediction is done using model.predict(xtest). The accuracy is calculated using accuracy\_score imported from metrics - metrics.accuracy\_score (ytest, predicted).

### **Visualization Module:**

Using matplotlib library from sklearn. Analysis of the crime dataset is done by plotting various graphs.

## **PROPOSED ALGORITHM'S**

- K-Nearest Neighbour(KNN) Algorithm
- Decision Tree Algorithm