

CRIME TYPE AND OCCURRENCE PREDICTION USING MACHINE LEARNING ALGORITHM

¹VENKATA DHARANIDHAR ACHARY JAVVADI, ²NAGA CHANDI PRIYA UDAYA SRI JAVVADI, ³MANIDEEP MUNAGANURU, ⁴A. BINDUKALA, ⁵Dr.G.RAJESH CHANDRA

^{1,2,3}B.Tech Student, ⁴Assistant Professor, ⁵Professor
DEPARTMENT OF CSE
SVR ENGINEERING COLLEGE, NANDYAL

Abstract: Crime is one of the serious issues in our society. It is the most predominant aspect of our society. It is also predominant in society. So, the prevention of crime is one of the important tasks. The crime analysis should be in a systematic way. As the analysis makes it important in the detecting and prevention of crime. The analysis detects the investigating patterns and helps in the detection of trends in crime. The main of this paper is the analysis of the efficiency of the crime investigation. The model is designed for the detection of crime patterns from inferences. The inferences are collected from the crime scene and these inferences, the paper demonstrates the prediction of the perpetrator. The paper gives the research way for the prediction of perpetrator age and gender. This paper gives two major aspects of crime prediction. One is perpetrator gender and the other is perpetrator age. The parameters used are analysis of the various factors like the year, month, and weapon used in the unsolved crimes. The analysis part identifies the number of unsolved crimes. The prediction task involves the description of the perpetrator's age, sex, and relationship with the victim. The dataset used in this paper is taken from the Kaggle. The system predicts the output using multi-linear regression, K-Neighbor's classifier, and neural networks. It was trained and tested using a machine learning approach.

Keywords: Crime Prediction, KNN, Decision Tree. Multilinear Regression; K-Neighbors Classifier, Artificial Neural Networks.

I. INTRODUCTION

A crime is nothing but it's an action. It constitutes an offense. It's punishable by law. The identification and analysis of hidden crime is a very difficult task for the police department. Also, there is voluminous data of the crime is available. So, there should some methodologies that should help in the investigation. So, the methodology should help to solve the crime.

The machine learning approach can better help in the prediction and analysis of the crime. The machine learning approach provides regression algorithms. The classification techniques provide help to fulfill the purpose of investigation. Regression techniques such as multilinear regression are a statistical method. This method helps to find the relationship between two quantitative values or variables. This approach predicts the values of the dependent variables based on the independent variables. The classifier techniques such as K-Neighbor's classifier. These classifiers are used to classify the multiclass target variables. The neural networks are used to improve the accuracy. The neural network has an input layer dense and has an output layer. Based on the above algorithms the perpetrator description such as sex, age, and the relationship are predicted. The model is thus expected to help to remove the burden of the police investigation. Thus, it helps to solve homicide cases.

This document is a template. An electronic copy can be downloaded from the conference website. For questions on paper guidelines, please contact the conference publications committee as indicated on the conference website. Information about final paper submission is available from the conference website.

II. LITERATURE REVIEW

Ling Chen, Xu Lai (2011) [1] has compared the experimental result that is obtained by the ANN (Artificial Neural Network). Jyoti Agarwal, Renuka Nagpal, et al., (2013) [2] has studied the crime analysis using K-means clustering on the crime dataset. They have developed this model using the rapid miner tool. The clustered results are obtained and analysed by plotting the values over the years. This model gives the result of the analysis that the number of homicides decreased from 1990 to 2011.

Shiju Sathyadevan, Devan M. S, et al., (2014) [3] have predicted the regions where there is a high probability of the crime occurred. They have visualized crime-prone areas also. They have classified the data using Naive Bayes classifiers. This algorithm is a

supervised learning algorithm that also gives the statistical method for classification.

Lawrence McClendon and Natarajan Meghanathan (2015) [4] have used Linear Regression, Additive Regression, and Decision Stump algorithms using the same set of input (features), on the Communities and Crime Dataset. Overall, the linear regression algorithm gave the best results compared to the three selected algorithms. Chirag Kansara, Rakhi Gupta, et al., (2016) [8] proposed a model which analyses the sentiments of the people on Twitter and predicts whether they can become a threat to a particular person or society. This model is implemented using the Naive Bayes Classifier which classifies the people by sentiment analysis.

III. EXISTING SYSTEM

The existing system gives an accuracy of only 65 %. The model is used only using linear regression. The multiple approaches of machine learning are not implemented. Also, the model has used the dataset of the limited crimes.

PROPOSED SYSTEM MODEL



IV. IMPLEMENTATION

The implementation details include the machine learning approach.

Data-collection:

The data collection for the implementation is from the Kaggle. The dataset is freely available. The record collected is almost 63000.

Pre-processing:

Once the dataset is collected, it must be pre-processed to get the clean dataset. The pandas and NumPy libraries are available in python for the pre-processing. It is removing of empty values from the dataset or repeated records should be removed.

Analysis:

The analysis includes the graphical representation of different values to analyse the dataset property. The different graphs are plotted by Matplotlib libraries. The graphical analysis gives a direction towards the prediction.

Training and Testing:

The dataset is divided into training and testing. Generally, 70 % dataset is kept for training and 30% for testing. The dataset ratio can be 70: 30 or 80:20.

Validation:

Once the model is created, it should be validated with the real-time data values. This is called validation. The validation is nothing, but its predicted value and it's also called the output value.

V. CONCLUSION

This model helps to predict crime. The perpetrator's age, perpetrator sex, and relationship can be predicted using a machine learning approach. The regression and classifier are used here give almost 80 %

accuracy. The dataset can be enhanced and can be used in other countries if the scenario is almost same. The model gives the overall prediction of any crime. This model can be enhanced by using deep learning techniques.

FUTURE WORK

This model gives an accuracy of almost 80 % for the perpetrator age, 82 % for the perpetrator sex, and 85 % for the relationship. The accuracy can be improved by using a complex neural network such as the recurrent neural network. Also, the deep learning approach can be used to enhance the accuracy of the model.

REFERENCES

- [1]. Chen, Ling, and Xu Lai. "Comparison between ARIMA and ANN models used in short-term wind speed forecasting." Power and Energy Engineering Conference (APPEEC), 2011 Asia- Pacific. IEEE, 2011.
- [2]. Agarwal, Jyoti, Renuka Nagpal, and Rajni Sehgal. "Crime analysis using K-means clustering." International Journal of Computer Applications 83.4 (2013).
- [3]. Sathyadevan, Shiju, and Surya Gangadharan. "Crime analysis and prediction using data mining." Networks & Soft Computing (ICNSC), 2014 First International Conference on. IEEE, 2014
- [4]. McClendon, Lawrence, and Natarajan Meghanathan. "Using machine learning algorithms to analyse crime data." Machine Learning and Applications: An International Journal (MLAIJ) 2.1 (2015).
- [5]. Kiani, Rasoul, Siamak Mahdavi, and Amin Keshavarzi. "Analysis and prediction of crimes by clustering and classification." Analysis 4.8 (2015)