iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 7 **Issue:** XI **Month of publication:** November 2019

DOI: http://doi.org/10.22214/ijraset.2019.11008

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.177
Volume 7 Issue XI, Nov 2019- Available at www.ijraset.com

Crime Analysis and Prediction using Data Mining Technique

Miss. Nikita Patil[1], Miss. Shubhangi Patil[2], Miss. Akshata Patil[3], Prof. Somnath J. Salunkhe[4], Miss. Supriya Patil[5]
[1, 2, 3, 4, 5]*Department of Computer Science and Engineering, Dr. J. J. Magdum College of Engineering, Jaysingpur, (Shivaji University, Kolhapur)*

Abstract: ***The aim is to provide a review of research regarding the prevention of crime in society. It implements various data analysis algorithm which gives the connection between crime and its pattern. The system takes the previous year records of crimes such as murder, kidnapping and abduction, dacoits, robbery, burglary, rape and other such crimes from authentic government sources. As we know the crime rates are increasing continuously and there is need to have control over the crimes to decrease the crime rate. For this there is need of such user friendly software which can analyze and detect the pattern of crime which already occurred and predict the crime. The system is mainly based on data mining concepts and also implements machine learning algorithms. It is very useful and helpful for police. It plays major role in crime investigation. It shows the areas having more rate of crimes. So that according to the crime rate police force on that area can be allocated. It is helpful for common people also. System will analyze and detect the crime rate and provide the visualized form.***
Keywords: Crime prediction, K-means, Naïve Bayes, R programming, Weka tool

I. INTRODUCTION

The crime rates quicken persistently and the wrongdoing examples are always showing signs of change. Therefore, the practices in wrongdoing example are hard to clarify. This paper describes how social development may lead to crime prevention. The aim is to provide review of research with respect to the prevention of crime in society and implementing various data analysis algorithm with gives the connection between crime and its patterns. The information for the venture is gathered from the authentic government sources. The information was changed over to .csv position whereupon preprocessing of the information was performed. Advancements utilized for mining different wrongdoing example and examination are Weka Tool and R Tool.

Weka Tool: Weka is a collection of machine learning algorithms which are used for data mining assignments. The algorithms can either be connected straightforwardly to a dataset or called from your very own Java code. Weka contains algorithms for data pre-preparing, classification, regression, clustering, association guidelines, and visualization.

R Tool: R provides a large catalog of statistical and graphical methods. R gives environment for statistical computing and graphics. R gives a wide variety of statistical (linear and nonlinear modeling, classical statistical tests, time-series analysis, classification, clustering and graphical techniques, and is very extensible.

II. RELEVANCE OF WORK

Crime is an act harmful not only to some individual but also to a community. It is one of the major issues that continuing to grow in intensity and complexity. For example, violent crime includes homicide, aggravated and simple assault, rape and sexual assault and robbery, while property crime includes burglary, larceny, motor vehicle theft and arson.

Now-a-days the rate of these crimes is increasing rigorously and there is need to have control over these crimes, to decrease the rate of crime. For this there is need of such software which can analyze and detect the pattern of crime which is already occurred and predict the crime. Crime prediction is a law enforcement technique that uses data and statistical analysis for identification of crimes most likely to occur. The main objective of our system is to detect the pattern of crime, analyze it and predict the crime.

The benefits of our system are-

A. It will be very useful and helpful for police as it will show the areas having more rate of crimes so that according to the rate of crimes in particular area the police force can be allocated over there.
B. It is also helpful for common people as they can built their houses in safer areas and also to girls to know whether their job areas are in safer areas or not.
C. System analyses crime to maximize the use of limited law enforcement resources.
D. System will provide visualized form of prediction which will help everyone to understand it easily.

©IJRASET: All Rights are Reserved

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.177
Volume 7 Issue XI, Nov 2019- Available at www.ijraset.com

III. PROPOSED WORK

Crime pattern detection, analysis and prediction system is mainly based on Data Mining concepts and also implements various machine learning algorithms. The focus of the system is to analyze the existing dataset related to crime records in various areas and to predict the possible type of crime that may happen at various locations.

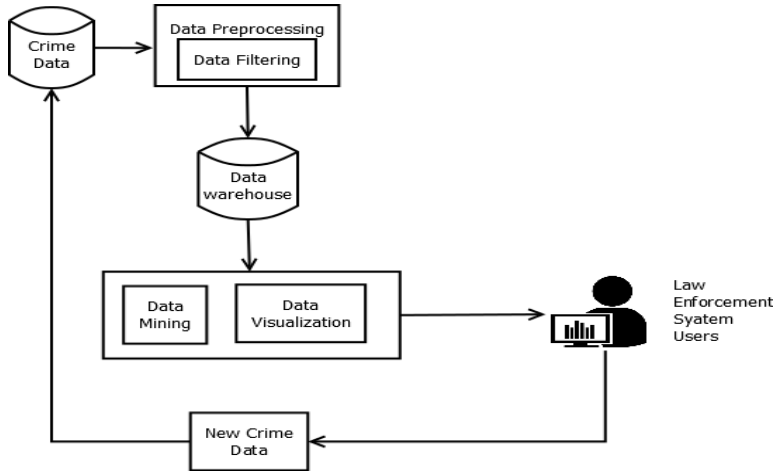


Fig. 1 System Architecture

The work is done in various steps as follows:

1) *Extraction of Data:* The crime data has to be acquired and integrated from different sources like websites. Such data can be available in any form like pdf file, excel sheets or images etc. It has to be brought to standard format for further processing like .csv. The dataset for work is taken from various websites like data.gov.in and kaggle.com.
2) *Preprocessing the Data:* The data extracted must be cleaned by removing noise and unnecessary records. Preprocessing on dataset is done by ignoring the inconsistent records and automatically filling the default values in those records.
3) *Classification of crime Data:* Classification is a type of supervised learning that consists of various algorithms. The system classifies the data into various types. The system uses Bayes algorithm for classification.
4) *Clustering of Dataset:* Clustering is type of unsupervised learning. It groups the similar data items into clusters. The purpose of crime data clustering is to find a set of similar crime incidents based on an offender's behavioral traits or to find a geographical area with a high concentration of certain types of crimes. The system uses k-means algorithm to group the data into various clusters that will be useful for prediction of crime.
5) *Prediction of Crime Type and Location:* The main objective of the system is to predict the crime type and location of crime. This can be done by using Naïve Bayes algorithm. Naïve Bayes is a type of classification algorithm used for prediction. It works on Bayesian principle. It finds the probability of event that may occur by using previous dataset.
6) *Visualization:* After analyzing and predicting the crime, it is important to give the output in appropriate way. Graphical representation is the best way to give the output as it is easy to understand to everyone. Finally, the result will be shown in tabular form or provided with any graphical representation.

This completes the work to be done under this project.

IV. TOOLS AND TECHNIQUES

The Crime analysis and prediction system is based on data mining which helps to prevent crime in society. So, to do the proposed work we required to use following tools and algorithms.

1) *WEKA:* Weka (Waikato Environment for Knowledge Analysis) is a collection of machine learning algorithms for data mining tasks. The algorithms are written in java and runs on any platform. Weka provides access to SQL databases using Java Database Connectivity and can process the result returned by a database query.
2) *R studio*: **R** is a programming language and free software environment for statistical computing and graphics supported by the R Foundation for Statistical Computing. The R language is widely used among statisticians and data miners for developing statistical software and data analysis. R is an integrated suite of software facilities for data manipulation, calculation and graphical display.

©IJRASET: All Rights are Reserved

Various machine learning algorithms are used in implementation of the work. These are:

a) *K-means:* K-means algorithm plays an important role in analyzing and predicting crimes. K-means algorithm will cluster co-offenders, collaboration and dissolution of organized crime groups, identifying various relevant crime patterns, hidden links, link prediction and statistical analysis of crime data. Clustering will be done based on places where crime occurred, gang who involved in crime and the timing crime took place.

b) *Naïve Bayes:* Naive Bayes is a simple technique for constructing classifiers: models that assign class labels to problem instances, represented as vectors of feature values, where the class labels are drawn from some finite set. Naive Bayes classifiers can be trained very efficiently in a supervised learning setting.

V. RESULT

In this module the various data mining procedures and machine learning algorithms were used to analyze the crime pattern and predict the location of crime and crime type. The result is finally presented through a web application in visualized form.

VI. CONCLUSION

The developed module will reduce crimes and will help the crime detection field in many ways that is from arresting criminals to reducing the crimes by carrying out various measures. This module will be helpful for various law enforcement system users as well as common people.

REFERENCES

[1] Chayya Chauhan and SmritiSehgal,(2017)“A Review: Crime Analysis using data mining Techniques and Algorithms” International Conference on Computing Communication and Automation

[2] Abba Babakura, Md Nasir Sulaiman and Muhmud A. Yusuf, (2014) “Improved method of Classification Algorithm for Crime Prediction” International Symposium on Biometrics and Security Technologies

[3] Sunil Yadav, Meet Timbadia, AjitYadav, RohitVishwakarma and NikhileshYadav (2017) “Crime Pattern Detection, Analysis and Prediction”International Conference on Electronics, Communication and Aerospace Technology

[4] Dr. M. Sreedevi, A.HarshaVardhan Reddy and Ch. VenkataSai Krishna Reddy, (2018) “Review on Crime Analysis and Prediction using Data mining techniques” International Journal of Innovation Research and Science, Engineering and Technology, Vol. 7, Issue 4, April 2018

[5] Nelson Baloian, Lt. Col. Oscar Figueroa, Marcos Orchard and Mario Vergara, (2017), “Crime Prediction using Pattern and Context”, Proceedings of the 2017 IEEE 21st International Conference on Computer Supported Cooperative Work in Design

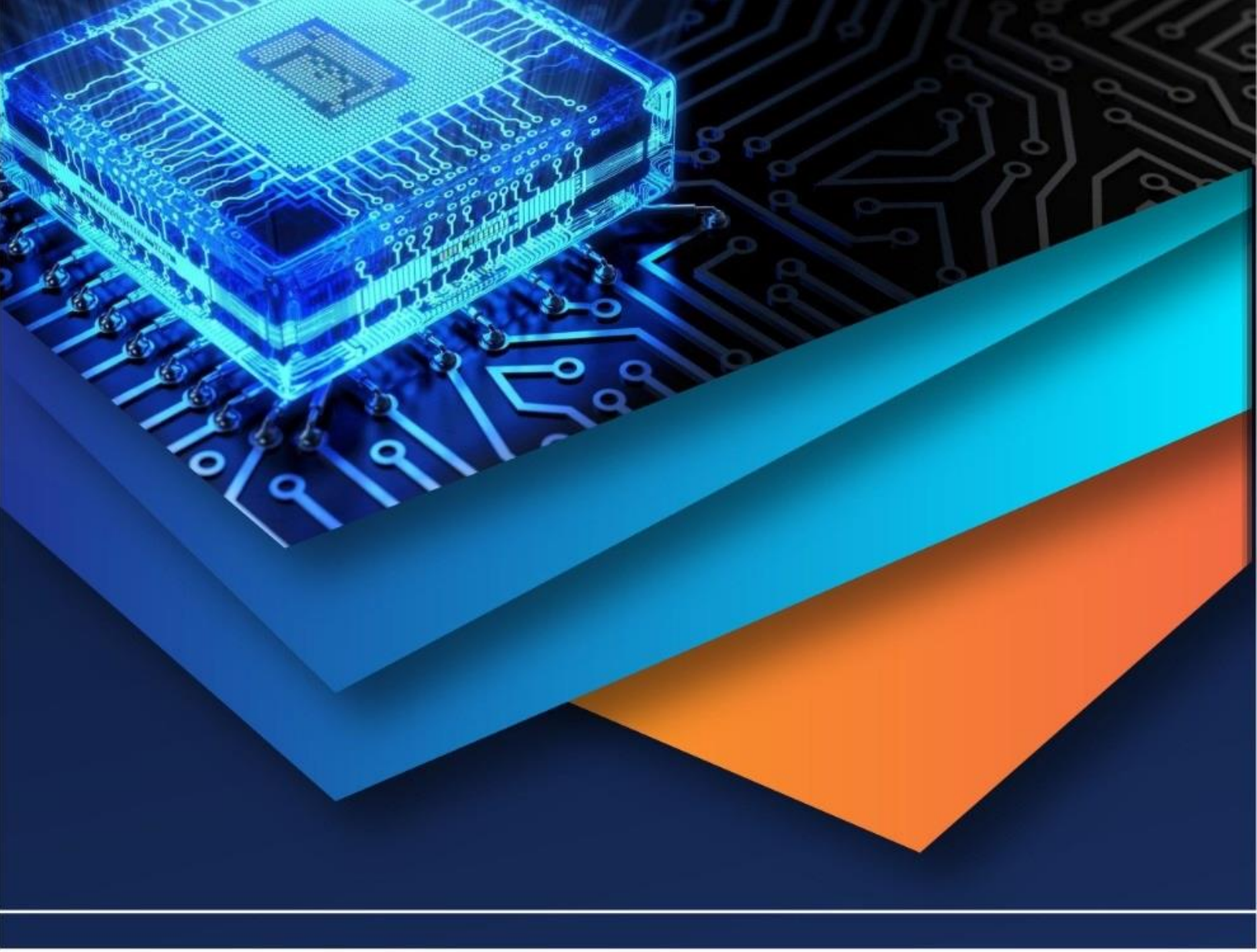
[6] Nafiz Mahmud, Khalid IbnZinnah, YeasinAr Rahman and Nasin Ahmed, (2016) “Crimecast : A Crime Prediction and Strategy Direction Service”, 19th International Conference on Computer and Information Technology.

[7] Jared Dean (2014) “Big Data, Data Mining and Machine Learning”

[8] Luis Torgo (2011)“Data Mining with R”

[9] Lan H. Written, Eibe Frank, Mark A.Hall (2011) “Data Mining- Practical Machine Learning Tools and Techniques”3rd Edition

©IJRASET: All Rights are Reserved



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)