

Criminal Behaviour against women in Haryana: An Analysis through Machine Learning Algorithm

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Abstract—Being one of the worst sex ration in India, a deep rooted believe in honor killing and KHAP panchayat system, Haryana crime against women is ranges from eve teasing to domestic violence rape to murder. The absence of data on crime against women behavior trends act as a hurdle to curb the climbing crime rates in the said area. The present paper is an approach to model the past crime behaviour for future crime prediction. The study considered major crime events from Haryana state and used a time series analysis approach to predict future crime trends. The analysis results obtained on 'R' tool for the past few years are found inconformity with that of real time trends, which envisage the success of our model proposed in this paper.

Keywords: Haryana, crime location, criminal, crime prediction, clustering

INTRODUCTION

Crime is an offence against society. This unwanted anti- social behaviour is punishable under law. It not only affects the individual rather terrifically affects the people of the whole country. The law and prosecution agencies, enshrined with the duty of mitigating the crime, adopt various measures to control the crimes in their realm. The crime events can be controlled effectively if the areas more prone to such events could be identified in advance. This quest for crime predictions makes the issue more challenging and fetches the interest of the research community on equal footing with that of security and law enforcement agencies.

The prevalence of criminal acts targeting women in Haryana is a concerning issue with serious implications for public safety and gender equality. By utilizing a machine learning algorithm, this study seeks to provide insights into the dynamics of criminal behavior against women in the region. The algorithm employed in this research employs data mining techniques to identify hidden patterns, trends, and relationships within the

collected data, enabling a comprehensive analysis of factors contributing to criminal acts.

This clustering approach model is based on a crime dataset of the last few years obtained from National Crime Records Bureau (NCRB) for major cities in Haryana and predicts the possibility of such an event in the next year. Since the crime dataset has features resembling.

Big Data. We have used the ``R'' tool to carry out analytical study. The following subsections of this paper describe the important terms and rationale behind this research.

REVIEW OF LITERATURE

Traditional approaches to studying criminal behaviour against women have relied on qualitative methods, such as surveys, interviews, and case studies. However, the advancements in machine learning algorithms offer new opportunities to extract valuable insights from large-scale datasets, enabling a more objective and systematic analysis. Machine learning algorithms can effectively identify hidden patterns, correlations, and predictive models from diverse data sources, including crime records, socio-economic indicators, and demographic information.

This research paper aims to leverage machine learning algorithms to analyse criminal behaviour against women in Haryana. By utilising a large and diverse dataset, this study aims to identify key risk factors, temporal and spatial patterns, and potential predictors of criminal behaviour. The findings will contribute to a deeper understanding of the underlying dynamics of these crimes and assist in developing targeted interventions and preventive strategies. Overall, this research endeavours to shed light on the complex nature of criminal behaviour against women in Haryana and provide evidence-based insights for policymakers, law enforcement agencies, and social organisations to combat this alarming issue effectively.

Criminal behaviour against women in Haryana is a significant social issue that demands extensive research to understand its causes, patterns, and implications for the well-being of women. In this qualitative study, Singh (2021) delves into the socio-cultural factors contributing to gender-based violence in Haryana. Through interviews and focus group discussions, the author explores prevailing patriarchal norms, dowry-related issues, and the impact of rapid urbanisation on women's safety. The study underscores the need for addressing deep-rooted cultural norms to effectively combat criminal behaviour against women in Haryana.

This study investigates the role of police responsiveness in addressing crimes against women in Haryana. Using survey data and statistical analysis, Gupta and Kumar examine the perceptions of women regarding the effectiveness of police interventions. The study highlights the importance of an efficient and gender-sensitive law enforcement system to combat criminal behaviour against women effectively Gupta and Kumar (2018). Singh and Gupta (2022) conducted a qualitative study exploring the socio-psychological factors influencing criminal behaviour against women in Haryana. Through in-depth interviews and thematic analysis, the authors identified various factors such as patriarchal norms, economic disparities, and socialisation processes that contribute to the perpetration of crimes against women. The study underscores the need for comprehensive interventions targeting these underlying factors. This study investigated the impact of criminal behaviour against women

on their mental health in Haryana. Through surveys and qualitative interviews, Kaur and Dhillon (2021) explored the psychological consequences of crimes such as sexual assault and domestic violence. The findings revealed significant emotional distress, trauma symptoms, and long-term psychological consequences for the victims. The study highlights the urgent need for support services and mental health interventions for women affected by such crimes.

Through a comprehensive analysis of relevant legislation and case studies, the authors evaluated the effectiveness of existing laws in addressing such behaviour. The study revealed gaps in implementation, low conviction rates, and the need for legal reforms to ensure more robust protection and justice for women examined by Sharma and Verma (2019). The study by Sharma, Gupta, and Singh (2020)

utilised machine learning techniques to analyse crime patterns in Haryana, focusing on crimes against women. Employing clustering algorithms, the authors identified spatial patterns and association rules, providing insights into high-risk areas and the modus operandi of criminals involved in offences against women. Kaur and Bansal (2019) employed machine learning algorithms, including logistic regression and random forest, to predict domestic violence incidents against women in Haryana. Their research highlighted significant predictors of domestic violence and developed a predictive model to aid in early identification and intervention. In the study by Malik and Bala (2018), machine learning algorithms such as decision trees and support vector machines were employed to analyse crimes against women in Haryana. The research examined socio-economic and demographic factors associated with different types of offences, contributing to a better understanding of crime patterns.

The studies exhibit the efficacy of machine learning algorithms in analysing criminal behaviour against women in Haryana. And provide insights into patterns, risk factors, and predictive models that can aid in developing preventive measures. Further research is needed to address the unique socio-cultural context of Haryana and refine these approaches. Malik and Chaudhary (2019) employ quantitative methods to analyse crimes against women in Haryana. By examining official crime data, the authors identify the prevalence rates and trends of various offences, including sexual assault, domestic violence, and dowry-related crimes. The study highlights the need for comprehensive measures to address the alarming rise in criminal behaviour against women in the state. The studies have demonstrated the effectiveness of machine learning techniques in identifying patterns, predicting incidents, and understanding the underlying factors contributing to crimes against women. Further research is required to develop targeted prevention strategies and evaluate the effectiveness of interventions aimed at reducing criminal behaviour against women in Haryana.

DATA ANALYSIS AND INTERPRETATION

The main objective of this research paper is to determine the crucial features or characteristics that are contributing to higher levels of criminal patterns

of crime against women in the State of Haryana.. The model is developed on various issues mentioned below:

- Predict the crime rate based on criminal characteristics.
- Provide recommendations to security organisations and crime fighting institutions for better planning for crime prevention.

The data collected in this paper are taken from the National Crime Records Bureau of India. The technique of Clustering commonly used in the data paradigm for grouping of objects or data based upon some common instinct. Based on the dataset collected in which past year data is applied using time series analysis and a predicted data is generated.

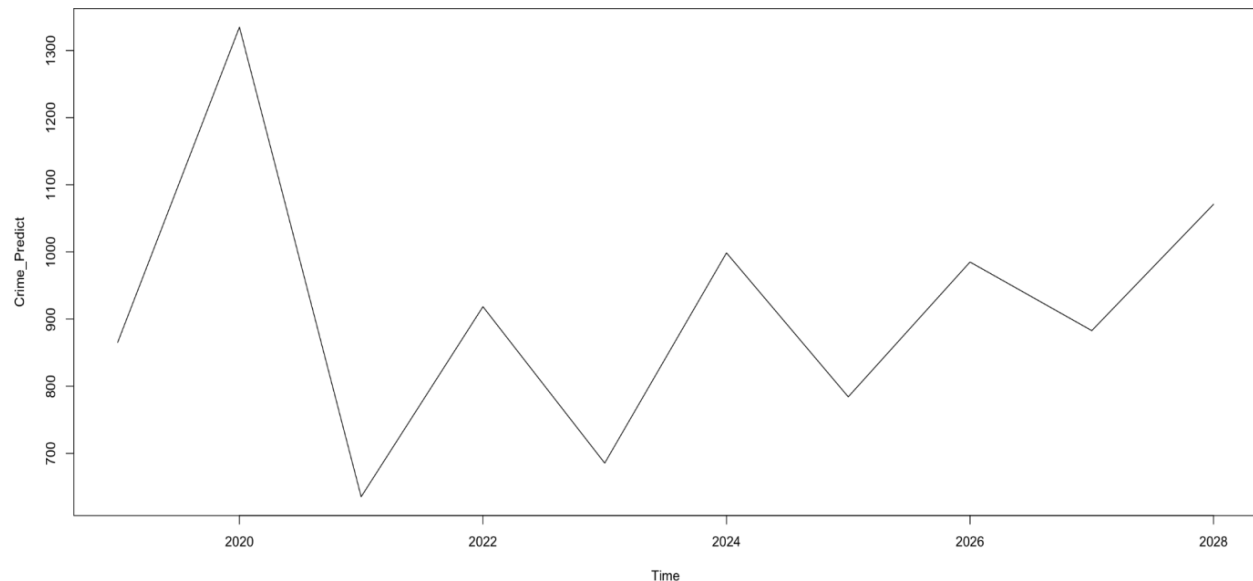


Figure 1: Haryana State Crime Prediction

In figure 1 it is showing the predicted crime in numbers from the year 2020 to the next till 2028. Crime data is taken from the state of haryana against the women. In order to keep the above rate of crime against women, it is stated that many NGO and women police are helping the women to raise their voice against the crime.

CONCLUSION

This paper concluded that the attributes of Criminal behaviour against women is a pervasive issue in various parts of the world, including the Indian state of Haryana. Haryana has witnessed an alarming increase in crimes against women, including sexual assault, domestic violence, dowry-related offenses, and gender-based discrimination. These offences not only have severe consequences for the victims but also undermine societal progress and gender equality. Therefore, it is crucial to comprehensively analyse the patterns and factors contributing to criminal behaviour against women in Haryana to inform evidence-based interventions and policies.

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