

Analysis and Prediction of Crime

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Abstract: *Crime has long been rampant in our society and continues to plague mankind so it is today. The Police Department continued to register dozens of such cases every day and release this data to the public as part of open data system. . The focus of the project to conduct an in-depth analysis of the major types of crime that occur in city, look for trends over the years, and determine the various attributes, such as seasons, and the impact of certain crimes. In addition, the proposed model is described that builds on the results of predictive statistics made, by identification attributes that directly affect the prediction. Specifically, the model predicts the type of crime that will occur in each district of the city. . Finally, our results has been tested and compared with previous work. The current tactics the police are working to detect criminals, after a crime has occurred. But, with the help of technological advances, we can use historical crime data to identify crime patterns and use these patterns to predict crime in advance. Our goal is to provide a crime prevention application to keep the community safe.*

Keywords: Analysis, Prediction, Time Stamp Series, Fbprophet, Web Scrapping Model, Live News Feed

I. INTRODUCTION

The crime rate is rising in all parts of the world every day. Kidnapping, Smuggling, Larceny, Threats, Counterfeiting, Homicide, Domestic violence, etc. Technology and its many benefits have contributed to the recent rise in violent crime these days. And technology is also the best weapon in our arsenal to prevent violent uprisings. Even if we can predict who exactly will be affected; by predicting the location, or the time when most crimes occur, we can definitely control the amount of crime that occurs and provide better ways to prevent promoting safety among people living in areas with such high crime rates. In our paper, we discuss the various crimes committed in Chicago and focus on understanding the same trends to help make it a better, safer city for its residents.

Knowing how many crimes are committed, why, and when and where they are committed can help us to avoid similar situations in the future. We use fbprophet library for predicting crime rates in the future. As mentioned in the abstract Facebook fbprophet library developed is known for its high accuracy, robust environment, full automation, and usable predictions. Predictability is a data science tool for setting goals, planning, allocating resources, and preventing potential misunderstandings by studying trends. One of the areas where fbprophet shines with seasonal demographic data and human crime rates is one such example. The database used for our prediction model is incredibly compatible with the way fbprophet works, making it an ideal solution for our problem statement.

II. LITERATURE REVIEW

This section will describe the methodology previously used by different research groups to solve the problem.

[1] Authors-"MRS.SAAMIYA NEWREKAR" authored "CRIME RATE PREDICTION USING FBPROPHET" - In this paper author explored how fbprophet works and predicted accurately the trend of the crimes committed in Chicago for the next two years, that is 2018 and 2019. it is clear that the number of crimes committed in Chicago has decreased and is expected to fall further, which is a good thing since it means that Chicago is becoming safer with time. The crime has decreased over time is verified by the fbprophet model, confirming its accuracy. As crime rates in Chicago are falling, we can further decrease it by implementing safety measures and making sure the felonies are reported properly. Fbprophet is considered as a very convenient approach for making predictions on time series data and this paper verifies its claim. The model can be used to predict the crime rate for any other city in the world, given that the dataset is available on the internet. With the help of this model, we can know which crimes are committed the most, where they are committed the most and which need immediate attention so as to decrease the number of crimes committed in the future.

[2] Authors-”CH. MAHENDRA , G. NANI BABU , G. BALU NITIN CHANDRA , A.AVINASH , Y. ADITYA ” authored “CRIME RATE PREDICTION” paper. With the help of machine learning technology, it has become easy to find out relation and patterns among various data's. The work in this project mainly revolves around predicting the type of crime and crime percapita which may happen in future. Using the concept of machine learning we have built a model using training data set that have undergone data cleaning and data transformation using Multi Linear Regression Algorithm. The model predicts the type of crime and Data visualization helps in analysis of data set and prediction of crimes. The graphs include bar, line and scatter graphs each having its own characteristics. We generated many graphs and found interesting statistics that helped in understanding different crime datasets that can help in capturing the factors that can help in keeping society safe.

[3] Authors “PROF. SHIVAPRASAD MORE, SAKSHI MENCH, SALONI KUGE, HAFSA BAGWAN” authored “CRIME PREDICTION USING MACHINE LEARNING APPROCH “ stated that their 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.

III. PROPOSED SYSTEM

3.1 Objectives

- Introduce a plan to reduce crime by analyzing crime information.
- As a problem-driven project, a large part of this project will involve the use of various retrieval algorithms
- To use different algorithms for identifying crime patterns and using these patterns to predict crime early.
- To provide different types of charts for the user given crime data set
- To give a function of live news feed

3.2 Solution

The explanation for the above mention problem is to create a system which can do analytics on the user given data and convert the data into different types of graphs and charts and also come up with the functionality to locate and analyze the crime rate for the location pin code which is user provided. And also do the future crime trend prediction using Time series prediction.

3.3 Web Scrapping Model

Web Scrapping model collects the crime data from news website and after tracing out the location , coordinates are fetched and are use to plot the Heat Map, representing the crime density on the basis of geographical location.

3.4 Crime Prediction

We are using FB prophet charting library to show the future crime trends for the relevant data set uploaded in the system.

3.5 Time Series Prediction

Time series predictions occur when you make scientific predictions based on historical time stamp data. It involves building models through historical analysis and using them to create awareness and advance future strategic decisions. An important difference in predicting that during work, future results are not fully realized and can only be measured by careful analysis and evidence-based significance.



3.6 Overview of System Design

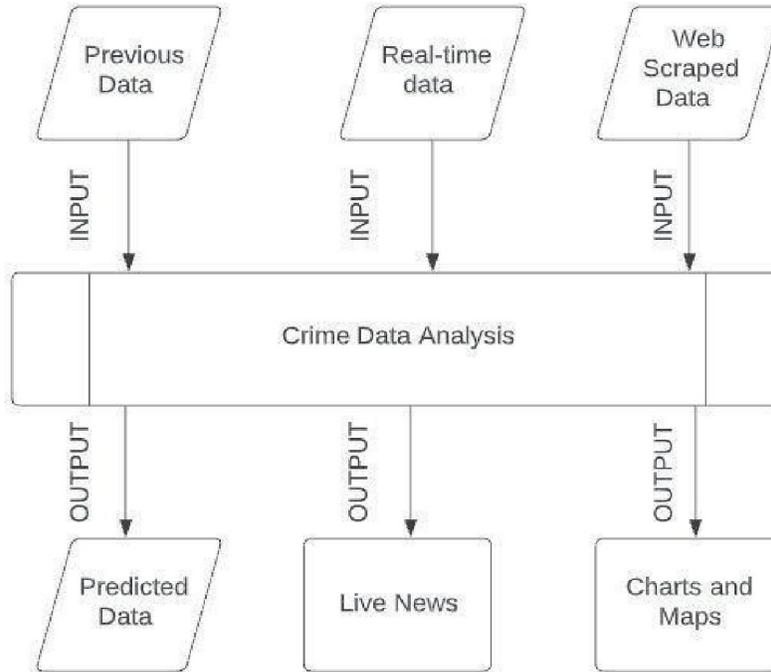


Figure: Working Model

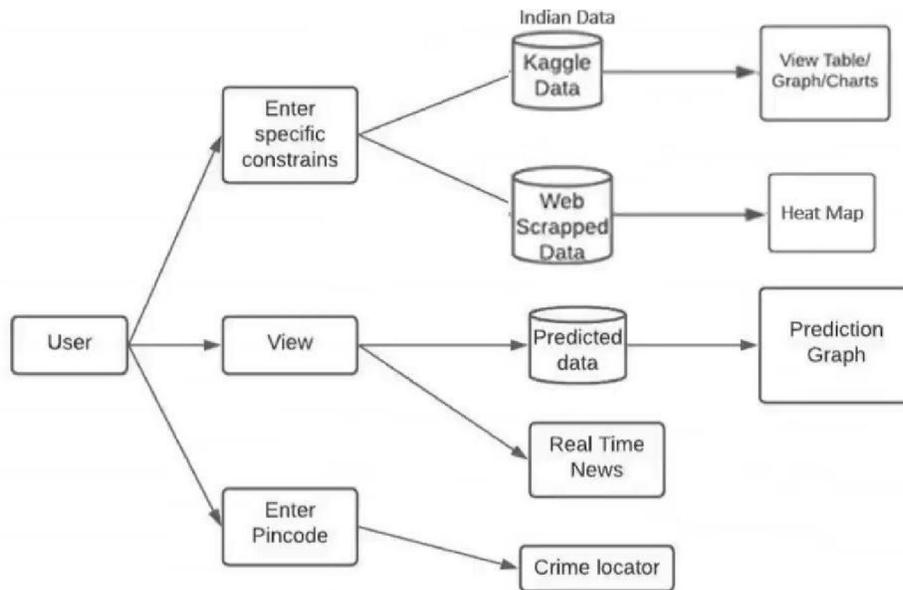


Figure: System Design



A. User System

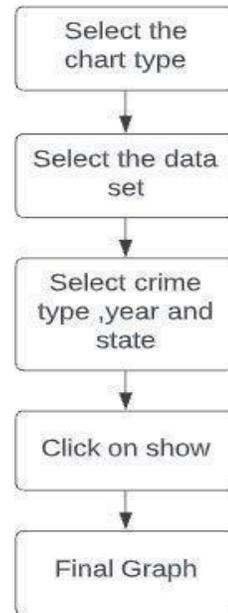


Figure: System Process for Visualization

The User can get the results of the desired data by following the above process

3.7 Implementation

This subsection explains how the main functionalities of the system are implemented.

- 1. Visualization of Graphs:** Understanding the database is an important factor in properly tuning and analyzing data. In our project, we have examined the data in one specific area, namely- calculating the number of crimes by their type. There are many types of data set provided into the system like Previous datasets, web scrapped data and predicted data. From these given data the user can choose any type in which he want the graph, But before selecting the dataset the user must select the chart type, there are many chart options provided like Bar chart, Area Chart, Bubble Chart, Line chart, Nested Pie Chart, Pie chart and Radar chart. After selecting the chart type and data set the user must select the type of crime in which he wants to see the chart followed by selecting the year and state after doing all these process the graph will be shown of user's interest.
- 2. Prediction Methodology:** The prediction task was done using FB prophet forecasting. fbprophet default settings produce forecast that are often accurate as those produced by skilled forecasters, with much less effort. With prophet with are not stuck with the results of a completely automatic procedure if the forecast is not satisfactory as an analyst in time stamp series methods can improve or tweak forecasts using variety of easily interpretable parameters. The Prophet uses decomposable time series model with three main model components Trend, seasonality, and holidays.
- 3. Crime Locator:** Crime Locator supply the functionality to Locate and Analyze the crime rate for the pincode of the location provided by the user. The user have to enter the pincode and search, then the state, district and rank will be portrayed, types of crime will also be shown and Location can be seen on the map.
- 4. Live News Feed:** The live news fees with a section in crime feed for crime news another for top stories and real time live news feed. The user just have to click on the news card to read more about the news article and have a look on top stories, crime news and live news feed.
- 5. Future Scope:** The system can be used to prevent the crime before happening based on the crime pattern it can be used by experts to catch the criminals and offenders which can result in decreasing the crime rate.

IV. CONCLUSION

The system do the analysis based on the given data set, it also do the prediction task along with the visualization and plotting work. This system can further be useful keeping records of crime it will also saves the time and prediction process will help to prevent crime in the society.

ACKNOWLEDGMENT

We would like to thank Asst. Prof. Vikas Baloda for encouraging our team to progress further and improve our project work. His guidance helped us to reach completion point in the project. We would also like to thank all the people who provided guidance. This was a difficult project and we were able to complete this project with our hard work so we would like to express appreciation for ourselves.

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