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CRIMINAL IDENTIFICATION USING ML AND FACE RECOGNITION TECHNIQUES

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ABSTRACT

In this era of recent times, crime has become an evident way of making people and society under trouble. An increasing crime factor leads to an imbalance in the constituency of a country. In order to analyze and have a response ahead this type of criminal activities, it is necessary to understand the crime patterns. This study imposes one such crime pattern analysis by using crime data obtained from Kaggle open source which in turn used for the prediction of most recently occurring crimes. The major aspect of this project is to estimate which type of crime contributes the most along with time period and location where it has happened. Some machine learning algorithms such as Naïve Bayes is implied in this work in order to classify among various crime patterns and the accuracy achieved was comparatively high when compared to pre composed works.

I.INTRODUCTION

Crime has become a major thread imposed which is considered to grow relatively high in intensity. An action stated is said to be a crime, when it violates the rule, against the government laws and it is highly offensive. The crime pattern analysis requires a study in the different aspects of criminology and also in indicating patterns. The Government has to spend a lot of time and work to imply technology to govern some of these criminal activities. Hence, use of machine learning techniques and its records is required to predict the crime type and patterns. It imposes the uses of existing crime data and predicts the crime type and its occurrence bases

on the location and time. Researchers undergone many studies that helps in analysing the crime patterns along with their relations in a specific location. Some of the hotspots analysed has become easier way of classifying the crime patterns. This leads to assist the officials to resolve them faster. This approach uses a dataset obtained from Kaggle open source based on various factors along with the time and space where it occurs over a certain period of time. We implied a classification algorithm that helps in locating the type of crime and hotspots of the criminal actions that takes place on the certain time and day. In this proposed one to impose a machine learning algorithms to find the matching criminal patterns along with the assist of its category with the given temporal and spatial data. 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 KNeighbor'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

II.EXISTING SYSTEM

In pre-work, the dataset obtained from the open source are first pre-processed to remove the duplicated values and features. Decision tree has been used in the factor of finding crime patterns and also extracting the features from large amount of data is inclusive. It provides a primary structure for further classification process. The classified

crime patterns are feature extracted using Deep Neural network. Based on the prediction, the performance is calculated for both trained and test values. The crime prediction helps in forecasting the future happening of any type of criminal activities and help the officials to resolve them at the earliest.

Disadvantages

1. The pre-existing works account for low accuracy since the classifier uses a categorical values which produces a biased outcome for the nominal attributes with greater value.
2. The classification techniques does not suited for regions with inappropriate data and real valued attributes.
3. The value of the classifier must be tuned and hence there is a need of assigning an optimal value

III.PROPOSED SYSTEM

❖ The data obtained is first preprocessed using machine learning technique filter and wrapper in order to remove irrelevant and repeated data values. It also reduces the dimensionality thus the data has been cleaned. The data is then further undergoes a splitting process. It is classified into test and trained data set. The model is trained by dataset both training and testing .It is then followed by mapping. The crime type, year, month, time, date, place are mapped to an integer for ensuring classification easier. ❖ The independent effect between the attributes are analysed initially by using Naïve Bayes. Bernouille Naïve Bayes is used for classifying the independent features extracted. The crime features are labelled that allows to analyse the occurrence of crime at a particular time and location. Finally, the crime which occur the most along with spatial and temporal information is gained. The performance of the prediction model is find out by calculating accuracy rate. The language used in designing the prediction model is python and run on the Colab – an online compiler for data analysis and machine learning models.

Advantages

1. The proposed algorithm is well suited for the crime pattern detection since most of the featured attributes depends on the time and location.
2. It also overcomes the problem of analyzing independent effect of the attributes.
3. The initialization of optimal value is not required since it accounts for real valued, nominal value and also concern the region with insufficient information.
4. The accuracy has been relatively high

when compared to other machine learning prediction model. Proposed methodology: The proposed a technique which is used to determine the clustering of criminals based on the criminal careers. The criminal profile per offense per year is extracted from the database and a profile distance is calculated. After that, the distance matrix in profile per year is created. The distance matrix including the frequency value is made to form clusters by using naïve clustering algorithm. They made a criminal profile which is established in a way of representing the crime profile of an offender for a single year. With this information, the large group of criminals is easily analyzed and they predicted the future behavior of individual suspects. It will be useful for establishing the clear picture on different existing types of criminal careers They tested the tool on actual Dutch National Criminal Record Database for extracting the factors for identifying the criminal careers of a person.

IV.MODULES

Service Provider In this module, the Service Provider has to login by using valid user name and password. After login successful he can do some operations such as Train and Test Data Sets,View Trained and Tested Accuracy in Bar Chart,View Trained and Tested Accuracy Results,View Predicted Crime Type Details,Find Crime Type Ratio on Data Sets,Download Trained Data Sets,View Crime Type Ratio Results,View All Remote Users. View and Authorize Users In this module, the admin can view the list of users who all registered. In this, the admin can view the user's details such as, user name, email, address and admin authorizes the users.

Remote User In this module, there are n numbers of users are present. User should register before doing any operations. Once user registers, their details will be stored to the database. After registration successful, he has to login by using authorized user name and password. Once Login is successful user will do some operations like post crime data sets, predict crime type, and view your profile.

V.OPERATION

Crimes are the significant threat to the humankind. There are many crimes that happens regular interval of time. Perhaps it is increasing and spreading at a fast and vast rate. Crimes happen from small village, town to big cities. Crimes are of different type – robbery, murder, rape, assault, battery, false imprisonment, kidnapping, homicide. Since crimes are

increasing there is a need to solve the cases in a much faster way. The crime activities have been increased at a faster rate and it is the responsibility of police department to control and reduce the crime activities. Crime prediction and criminal identification are the major problems to the police department as there are tremendous amount of crime data that exist. There is a need of technology through which the case solving could be faster. An increasing crime factor leads to an imbalance in the constituency of a country. In order to analyse and have a response ahead this type of criminal activities, it is necessary to understand the crime patterns. This study imposes one such crime pattern analysis by using crime data obtained from Kaggle open source which in turn used for the prediction of most recently occurring crimes. The major aspect of this project is to estimate which type of crime contributes the most along with time period and location where it has happened. Some machine learning algorithms such as XGBoost,KNN is implied in this work in order to classify among various crime patterns and the accuracy achieved was comparatively high when compared to precomposed work.

Fig.5. Data set details with prepossessing

Fig.6. Accuracy details.

VI. METHODOLOGY

The project involves a systematic approach that integrates multiple machine learning algorithms and face recognition techniques to identify criminals based on available datasets. The first step in the methodology is user registration and login management, where both service providers and remote users must register and authenticate themselves before accessing system functionalities. Service providers can upload crime data, train machine learning models, and assess accuracy metrics. They also have the ability to

download trained datasets and analyze crime type ratios.

Once the data is collected and processed, the next step involves training a machine learning model using historical crime data. The model is then tested using separate datasets to evaluate its performance. Accuracy is analyzed through bar charts to visualize the results and identify any patterns or trends in the crime data. For the crime identification task, face recognition techniques are employed, where the system captures facial features of suspects and compares them against a database of known criminals. This helps to recognize criminals based on facial features and match them with the information from crime datasets. The admin module allows the system to manage and authorize remote users. The admin views the list of registered users and verifies their credentials before granting them access to the system. Users, after being authorized, can upload crime data, predict the type of crime, and view their profiles to track their activities within the system. Additionally, users can analyze crime data trends and crime type ratios, providing valuable insights into criminal activities. The system also provides options for visualizing and downloading results, making it easier for law enforcement agencies and authorities to take preventive actions based on predictions and face recognition outcomes. In summary, the methodology combines machine learning techniques for crime prediction, face recognition for identifying criminals, and a user management system that ensures seamless and secure interaction with the platform. The integration of these technologies aims to provide a robust solution for criminal identification and prediction using both structured crime data and biometric face data.

VII.CONCLUSION

In this paper, the difficulty in dealing with the nominal distribution and real valued attributes is overcome by using two classifiers such as Multi nominal NB and Gaussian NB. Much training time is not required and serves to be the best suited for real time predictions. It also overcomes the problem of working with continuous target set of variables where the existing work refused to fit with. Thus the crime that occur the most could be predicted and spotted using Naïve Bayesian Classification. The performance of the algorithm is also calculated by using some standard

metrics. The metrics include average precision, recall, F1 score and accuracy are mainly concerned in the algorithm evaluation. The accuracy value could be increased much better b y implementing machine learning algorithms.

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