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CRIME HOTSPOT PREDICTION

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Abstract:
Crime is a serious problem that affects many people in society. Crime prevention and reduction is a top priority for many countries. Given the limited resources for policing and reducing crime, it is important to identify effective strategies to optimize available resources. For this problem, crime gold estimation has been made before. Crime hotspot forecasting uses historical data to identify areas prone to future crime.However, the final method for crime hotspot prediction is to use only crime-related misinformation to identify crime hotspots and ignore the predictive power of other information such as public information or social media. In this article, we present Crime, a platform for predicting and visualizing crime hotspots based on the integration of different types of data. Our platforms regularly collect general and social data as well as crime data from across the web. It also provides useful features from data collected based on statistics and language analysis. Finally, it identifies crime points using the subtraction method and provides a view of hotspots on the interactive map.Crime forecasting is crucial to inform policing strategy and improve crime prevention and operations. Machine learning is now a predictive subject. But many studies have compared different types of machine learning to predict crime. This article uses real-time data on public crime from 2015 to 2018 in an area of a major coastal city in eastern China, based on observational data, to evaluate the predictive ability of various machine learning algorithms. Results from crime scene data alone show that the GEO OLD model outperforms CNNs, Arbitrary Wood, Support Vector Machines, Naive Bayes, and Convolutional Neural Networks.Additionally, erection topographic data related to point of interest (POIs) and public road network density are entered into the tGEO OLD model as covariates. Models producing terrain covariates have been found to have better predictive performance than traditional models based on false data on crime rates. Therefore, predicting future crime should use unbiased information about crime and crime-related covariates. Not all machine learning algorithms are equal in predicting crimes. Crime forecasting is crucial to inform policing strategy and improve crime prevention and operations.Machine learning is now a predictive subject.

Keywords: Face Detection, CNN, Geo-Fencing

I. INTRODUCTION:

What we believe we have accomplished is to develop a system that the police or investigative services can use to detect criminals in person. The face recognition method used is fast, powerful, simple, and accurate, and the algorithms and techniques are simple and easy to understand. The face is important to the human body. This is the feature that usually distinguishes a person. Facial recognition is an interesting and complex problem that affects important applications in many fields such as legal verification, bank access authentication and security, and identity verification. Facial recognition is an easy task for humans, but a different task for computers. Spatio- temporal data on public safety have grown exponentially in recent years. However, not all information is useful for solving real-world problems. To help prevent crime, some researchers have developed models to predict crime. Most use only historical crime data to test predictive models. Current research on crime prediction mainly focuses on two issues: safe area prediction for crime and crime hotspot prediction. Estimation of crime risk areas based on crime-related factors refers to the relationship between crime and the physical environment, both originating from "everyday work". The traditional crime risk estimation method finds crime hotspots from the distribution of crime events and assumes that the model will exist in the future. For example, given the proximity of the crime scene and the concentration of crime, the terrain risk model appears to use crime climate factors and crime history data useful for long-term and stable crime rates. Various studies have examined crime estimates over time, combining demographic and economic data, land use data, cell phone data, and traffic history data. Crime hotspot prediction aims to predict where future criminal events will occur and hotspots where future events will occur. A widely used method is kernel density estimation. Models that include time or space autocorrelation of past events outperform models that do not include autocorrelation. Recently, machine learning algorithms have become popular. Among the most popular methods are K- nearest neighbor (CNN), random forest algorithms, support vector machine (SVM), neural networks and Bayesian models, etc. Some compared the crime comparison model, some Bayes model, and BP neural network, and some compared the spacetime kernel velocity method and crime prediction of random forest path many times. One of the most effective learning methods among these algorithms, CNN, Algorithm Convolutional Neural Network (CNN) has strong scalability and can enhance its teaching power with deep layers to solve technical problems. The Short-Term (GEO FENCING)
neural network extracts time-series features from those that are useful for processing data with strong time-series trends. This article will focus on comparing the 6 machine learning algorithms mentioned above and suggesting the best by demonstrating their predictive power with and without covariates.

Proposed Methodology:

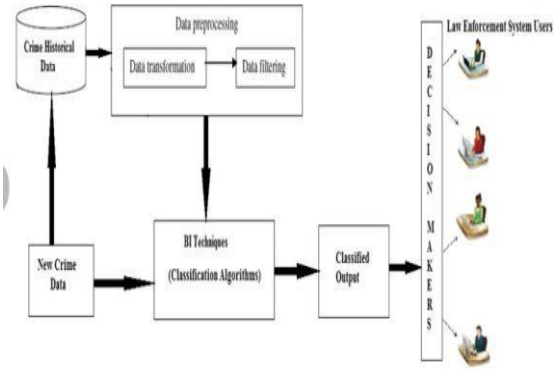


Fig 1.System Architecture

Today, advanced technology has become the key to crime prevention, detection, and surveillance applications. Most of the crime analysis today is done using one form or another of machine learning. Report of criminal diagnosis in women using technology. The authors estimated violations using previous data. A method is presented here to detect a crime by capturing images and videos of people arrested from previously recorded data in the documents. DCNN etc. such as different CNN architectures. was used to detect bad behavior in screenshots. DCNN can identify important features of frames with the help of the HDL algorithm. Criminals can be detected in real-time using videos, photos, and reports that can be sent to nearby authorities. The model before deep learning has been used in documents related to, such as the VGG-19. Real-time crime detection using machine learning and deep learning to prevent crimes, this application process helps police officers to understand possible situations in time and also provides pre-recorded information about crimes, for example, ID and history water seller. The continuous search and detection process is simplified with the identification of the criminal's face and identification of the details. The proposed system predicts the crime rate in a specific area based on the trained data and previous data sets to
find areas that are crime hotspots. There

are various crime listings and previousrecords to help users find crime rates by crime type. Predict crime locations using G EO FENCING algorithms to locate crime scenes.

A. System Architecture:

Facial exposure is the key step in building a face validation system. Here the model recognizes the face and selects whether it is a face or not. It also allows the model to recognize and see faces almost seamlessly, by choosing whether or not the model can see objects and bodies according to the instructions. Input images are database images (preparation) and transaction images (face recognition verification). Precare is a name that always works on an emotional level with pictures below the words and the result is a powerful image. The main sign of progress is the improvement in image data, which may affect the transition or review of some large images that need further processing. Before looking at removing the center of the part, the activity of destroying the distorted image should be done. Feature extraction and matching are based on these tasks. In addition to the main features, there are additional modifications. The feature extraction strategy is used to remove components while retaining a certain amount of information that should be available during extensive manipulation of image data. Provide data ready to hear the stepper algorithm. The rendering is done by Haar cascades.

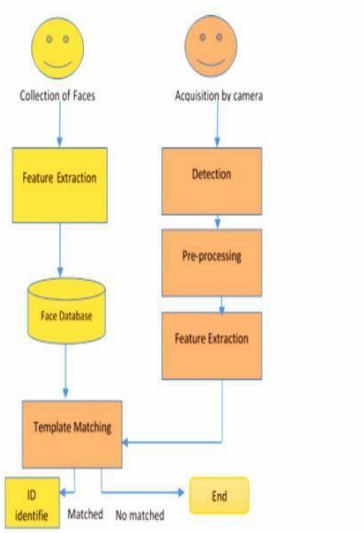


Fig 2.Flow for Face Detection

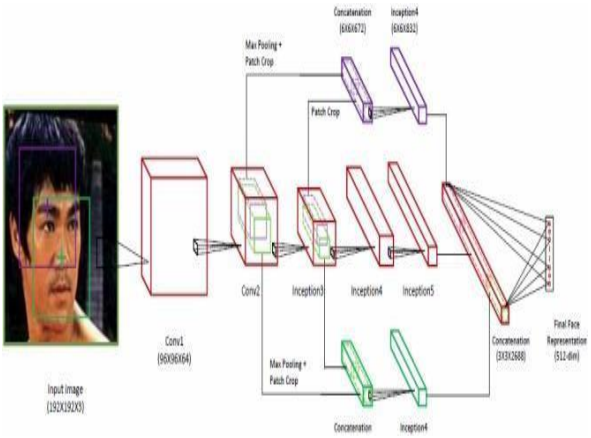
Image preprocessing: Images taken with the camera contain optical elements and require some pre-processing. system distortion, system noise, underexposure or unwantedcamera movement; Cars that degrade picture quality, etc. So i mage preprocessing is transformation. RBG to grayscale. Italso removes noise and improvescorrect boundaries. brightness.
Face detection: face detection phase (also known as face localization) An image is captured and the location of the face in that image is extracted from the background. Noise is removed from the image. When images were taken in a controlled environment A simple edge detectiontechnique should suffice. The image
was originally converted to Grayscale, but skin-
based facial recognition is also on the way to color.
Images of the
face were taken with adequate lighting and a controlled background. Face recognition is simple once you pose. Detect and prepare faces in images. To break it down to the next level: 1.Input images taken with a digital camera and often color them Converted to grayscale images.
2. Removed noise from the image. 3. The image will be cropped according to the size ofthe image saved in the database.
Feature extraction: Feature extraction is in progress. instead of directly By comparing the query face to the face imagesavailable in the database Check the size of the image and then compare it to the database. he removed Duplicate Information. It also

Reduces complexity and processing power. made use of PCA, LDA, or acombination of both methods. You usually use your own face. Facerecognition using PCA. Applying LDA after applying PCA A furtherreduction in dimension .

B. Convolutional Neural Network (CNN): Image classification refers to the task of extractinginformation from two or more image classes.Artificial intelligence has made great strides incombining the diverse abilities of humans and machines. Both researchers and promoters haveworked on many aspects of this field and haveachieved excellent results. One of many such jobs isssprocess should enable machines to see the worldas humans do, see the world in the same way, and use the information for various tasks such asdisplaying and rendering images. Image recognition,image analysis and classification, multimediaentertainment, recognition, natural languageprocessing, and more. Advances in computer visionthrough interactive learning have developed andimproved over time, primarily with the help ofunique algorithms: Convolutional Neural Networks.

A convolutional neural network (ConvNet/CNN) is a deep learning algorithm that can take an input image, assign importance (trainable weights andbiases) to different aspects/objects in the image and distinguish them from each other. The system d

Fig 3 Architecture of CNN



etected various facial
landmarks such as the chin, left eyebrow, right eyebrow, bridge of the nose, bridge of the nose,
left eye, right eye, outer lip, and inner lip.
All distribution projects are based on registration information; that is, people have to transfer their kno wledge to information in order to understand the relationship between text and information. This is call ed supervised learning. Recognizes thoughts in spe ech to recognize faces, recognize people in photos, recognize faces (seen, happy), recognize objects in photos (stop signs, pedestrians, lines...), distinguish letters, spam (in email) or fake letters (covered by insurance); Confirm the opinion in the text (customer instructions) All the human labels can be generated, you enjoy the satisfaction and all th e benefits associated with the data that comes voluntarily to t rain the neural network.

C. Geo Fencing Algorithm:

A geofence is a virtual border delimiting an arbitrary geographic region. We use these constructs to classify whetheran object lies inside the area of interest, like when we want todetermine if a car has entered a specific parking lot. Geofencesdo not have to correspond to specific physical locations and may convey more subtle concepts, such as a tornado alley or a no-fly zone.

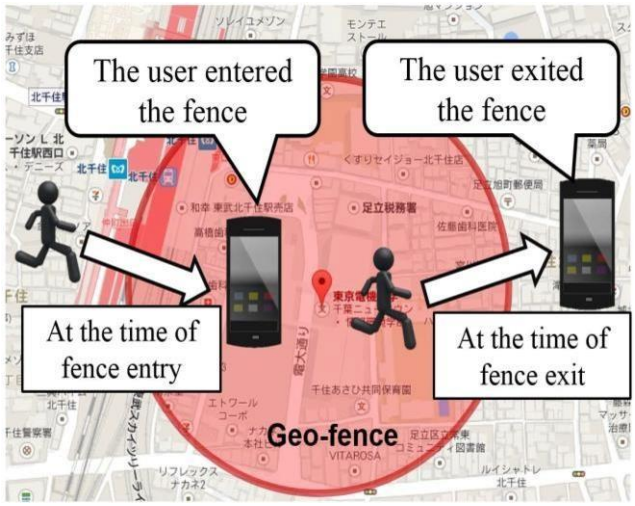
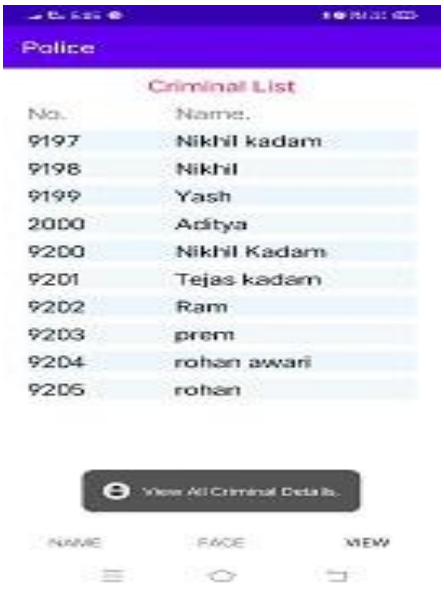


Fig 4. Geo-Fence

II. Implementation and Result:


Police
SOS
Sejal
Theft
CHOOSE IMAGE
ADD IMAGE
CRIMINAL LIST


Police
Criminal List
No. Name.
9197 Nikhil kadam
9198 Nikhil
9199 Yash
2000 Aditya
9200 Nikhil Kadam
9201 Tejas kadam
9202 Ram
9203 prem
9204 rohan awari
9205 rohan
NAME FACE VIEW


Home Activity
Do you want to logout..?
NO YES
VIEW CRIMINAL
COMPLAINT STATUS
LOGOUT


Police
ADD FACE
No Face Detected!
ACTIONS
NEXT


Police
Criminal List
No. Name.
9197 Nikhil kadam
9198 Nikhil
9199 Yash
2000 Aditya
9200 Nikhil Kadam
9201 Tejas kadam
9202 Ram
9203 prem
9204 rohan awari
9205 rohan
NAME FACE VIEW


Home Activity
ADD CRIME/CRIMINAL
ADD CRIMINAL
VIEW CRIMINAL
COMPLAINT STATUS

III. Analysis:

In this project, we are able to detect and recognize crimes in real time in the images and videos taken by the camera. We use Hear feature-

based cascading classifiers for face detection in our OpenCVapproach. This is a machine learning-

based approach where a stepwise function is trained from a l arge number of positive and negative images. It is then used to capture objects in other images. We also use a convolution al neural network (CNN) for face recognition.

A few advantages of this algorithm are: useful selection, adju stment and position parameters, instead of measuring the ima ge itself, other objects (cars, signs, license plates, etc.) . CNN experts can recognize faces with high accuracy in different li ghting conditions.

Additionally, CNNs can effectively describe even a single image. Our app has some drawbacks, for example: the meter w orks best in front-

facing images; it only works with 45° face rotation betweenvertical and horizontal.

IV. Conclusion And Future Scope:

When the spectator is free, he can effectively recognize the culprit from pictures and other proof at the minute of awful behavior. Be that as it may, in the event that an offense happens without witnesses, a facial recognizable proof framework can be utilized to distinguish the bully. These models are exceptionally valuable for finding culprits after terrible be havior. Protect sees reprobates that offer assistance to check terrible behavior. The necessity of the framework is that hoodlums in most cases don't go against the cameraor dodge it. Certain faces may need anything near to segregating more cloud facial high lights, such as the meaning of the eyes. In future work Classification of any individual requires exertion, but more care and earnestness is required to classify a criminal or a suspect. The deficiency of this work can be in its few defect since any off-base classification can have genuine impacts. It'll be exceptionally one-sided and as well hopeful for us to say that the 99 percent precision that has been accomplished by CNN is cent percent worthy. Usually since of different reasons like, a little estimate of the data- set, all pictures taken may not be taken within the same conditions, which can raise questions in this classification. Majorly facial Pictures are classified utilizing facial feelings and age, so to begin with unbiased pictures and elderly, and children pictures were killed. We attempted to expel this predisposition by utilizing haar cascade by trimming the facial portion out of the pictures but too appeared they have less effect on what comes about. So in case we make a more noteworthy data set, taking into account the different components specified and recognizing other identity traits/features can be our future scope of ponder.

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