An Intend Method for Tracking and Detecting Crime using Clustering Techniques

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ABSTRACT

Clustering, Segmenting and tracking multiple humans is a challenging problem in complex situations in which extended occlusion, shadow and/or reflection exists. This method includes two stages, segmentation (detection) and tracking. Human hypotheses are generated by shape analysis of the foreground blobs using human shape model. The segmented human hypotheses are tracked with a Kalman filter with explicit handling of occlusion. The proposed work is concentrated using DBSCAN algorithm, where after tracking, the individual person is analysed for different crimes like riots,arson etc.The verification is done by walking recognition using an articulated human walking model and Density based algorithm. Experiments show that our approach works robustly in very challenging Sequences. Information stored in database are analyzed using data mining techniques back propagation ,data association and DBSCAN.

General Terms-- Human Tracking, Segmentation, clustering, KalmanFilter, DBSCAN, Motion Template.

I. INTRODUCTION

Tracking humans in video sequences is important for number of tasks such as video surveillance and event inference as humans are the principal actors in daily activities of interest. We consider scenarios where the camera is fixed; in this case, moving pixels can be detected fairly reliably by simply subtracting the background from the new images. In simple situations, each moving blob corresponds to a single moving object, such as a human or a vehicle; such assumption has been common in past research . However, in more complex and realistic scenarios, a single blob may contain multiple humans due to their proximity or the camera viewing angle, and also contain pixels corresponding to the shadows and reflections cast by the moving objects Our objective in this research is to predict and track the crimes in particular city after tracking using video's the density based clustering is performed to predict the crime, also previous work is concentrated only on tracking the humans where as in this proposed work predicting using clustering algorithm is given. Nowadays crime become one of the main issues, the crime can be of legal and non-legal crime. The tracked trajectories as well as other properties can be passed to an event recognition system to perform high level interpretation of human behaviors.

There are many difficulties in solving this problem. This must segment a type of crime that do and do not correspond without knowing how many crimes has been taken place. As we mentioned first we have to concentrate on tracking peoples, the appearance of a human changes continuously due to non-flexible human action (e.g., walking, running, carrying an object while walking) and the changes in the viewpoints.

Vehicle motion may also be present but is usually easily distinguished from human motion due to its speed and blob shape. To solve the problem of human tracking under complex situations by taking advantage of various camera, scene and human models that are available and applicable for the task. The models used are: **Camera model, Background appearance model** .

Criminology is one of the important area where criminal behaviors are identified. It is one of the most important fields where the application of data mining techniques produce important results. criminology is of legal and non-legal crime. The Legal crime is based on breaking of criminal laws and non-legal crime is one which is based on violating of socially accepted rules. Crime spots can be measured using types of crime .Crime types like riots ,arson, crime against property, crime against child abuse, omens Dowry etc.

II. APPROACH OVERVIEW

Crime becomes an nonsense ,nowadays child abuse becomes popular among crimes. Due to increase in crime rate .Clustering techniques is used to crime spot the criminals.

2.1 Data Mining Overview

In crime data mining local law enforcement agencies have also become more alert to criminal activities in their own jurisdictions. One challenge to law enforcement and intelligence agencies is the difficulty of analyzing large volumes of data involved in criminal and terrorist activities. Data mining holds the promise of making it easy, convenient and practical to explore very large database for organizations and users. Here in this

work data mining techniques are applied in the context of law enforcement and intelligence analysis.

Overview of crime data mining:

Crime data mining can be directed in two ways like crime types based on security concerns and crime data mining approaches, techniques.

Crime Types could be of Violent Crime, Property Crime, arson, riots, crime against women and child, traffic violations, TM crimes, cyber crime, financial crime, Dacoity .Crime can be classified in local crime(illegal parking, robbery) and international crimes(Taj Hotel attack, Delhi incident which is against women, child abuse and sexual harassment).Crime is an act of omission of duties.

Against women./child includes rape, child abuse, dowry, sexual harassment, cruelty against their relations.

2.2 Overview of clustering techniques

Clustering technique group data items into classes with or which has similar characteristics ,some of the research work is concentrated on statistic-based

vehicle and some other crime records. Crime related to bank sectors users financial crime enforcement network, TM crime related to analysis of money laundering and other financial crimes. crime related to robbery, terrorism is based on the analysis of local and international crimes. Clustering crime can automate a major part of crime which is typically required. Clustering technique is based on association rule mining, sequential pattern mining and so on.

Grouping of an cluster analyzed object based on information formed in data describing objects or their relationship. Some of the basic clustering techniques are Hierarchical / Partitioned clustering , Divisive / Agglomerative clustering , Increment / non-incremental clustering.

The proposed work is based on K-means and DBSCAN technique's. K-means is one of the basic clustering technique which is very fast but cannot work properly in noisy environment. In order to overcome the drawback of K-means clustering DBSCAN is used which works faster even in noisy environment ,clusters points initial centroid, and assign closest centroid, then recomputed the centroid of each cluster. DBSCAN which is implemented in noisy environment, noise point is any point that is not a core point or border point. DBSCAN also works with a number of different distance metrics. This is concentrated on density Reachable and Density Connected

Threshold is used in clustering technique in order to specify that all points lie sufficiently close to one another.

Crime approaches and their techniques could be of identifying interesting structure in data, where structure represents patterns, statistical or predictive models of the data. Some of crime mining techniques are entity extraction(used to extract personal details of the criminal),clustering techniques like DBSCAN ,classification to identify or to detect who have send the particular details, many of the social networks nowadays become criminal network which also used for the analyze of criminal roles and entities among criminal network. The detailed discussion of property crime includes murder, robbery, burglary, theft etc, violent crime includes murder, attempting to suicide ,hurt etc, crime.

concept space algorithm, in order to automatically correlate different objects such as persons, organization,

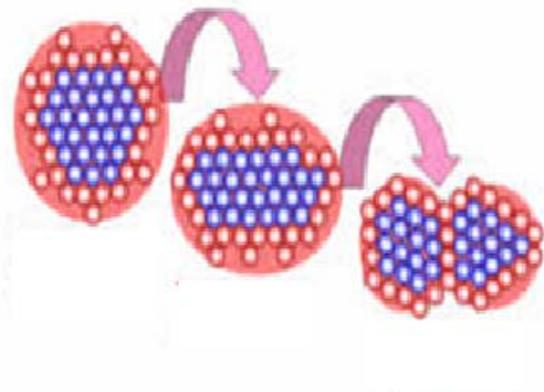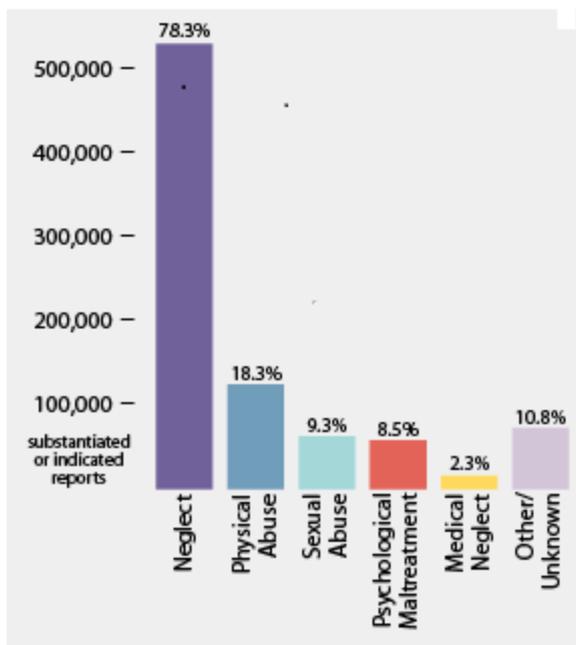

Fig1: Threshold model of values

Fig2: Clustering form of representation

III. METHODOLOGY

Data Mining in the study and analyze of criminology that can be categorized into crime organize and repression. Crime organize gives the knowledge on prevention of occurrence of crime by analyzing the repetition of crime, whereas crime repression is concentrated on catching the criminal based on his/her previous crime records.

Fig3: Statistic rate of child abasement and the type of abuse

Thus clustering technique using data mining comes during handy to deal with massive amounts of data and dealing with noisy or missing data about the crime incident We used k-means clustering technique here, as it is one of the most widely used data mining clustering method

Prefer to verify the supposition with dynamical characteristic while they are being tracked. To choose and authenticate the hypotheses by recognizing if the hypotheses reveal a human walking pattern. In walking gratitude use an articulated human walking model to envisage motion templates . Then the motion templates responses are incorporated over time to achieve walking recognition. The hypotheses that passed the confirmation are confirmed as humans and those failed are removed. This is the selection of human motion after which the selection process is completed the predicting of culpt is detected using the crime spot techniques. This selection process is used because the person may be walking, running, may carry any objects with him like(knife, gun, wood, Bat etc) in order to predict this tracking methodology is used here.

Crime Type	Weapon	Suspect Race	Suspect sex	Suspect age	Victim age
Robbery	Knife	B	M	Middle	Elderly
Robbery	BAT	W	M	Young	Old
Robbery	Pistol	B	M	Middle	middle
Robbery	Knife	B	F	Middle	young

Table 1: The Predicted values based on their crime

We look at table 1 with a simple example of crime list. The type of crime is robbery and it will be the most important attribute. The rows 1 and 3 show a simple crime pattern where the suspect description matches and victim profile is also similar. The aim here is that we can use data mining to detect much more complex patterns since in real life there are many attributes or actors for crime and often here is fractional in sequence available about the crime. In a general case it will not be easy for a computer data forecaster or detective to spot these patterns by simple querying.

IV.   OVERVIEW OF WEKA TOOL

The **nature** responsible for Weka's are:
– it provides many different algorithms for data mining and machine learning
– is is open source and freely available
– it is platform-independent

– it is easily useable by people who are not data mining specialists
– it provides flexible facilities for scripting experiments.
– it has kept up-to-date, with new algorithms being added as they appear in the research literature.

Machine Learning
Data pre-processing and hallucination
• Attribute selection

- Classification (Decision trees)
- Prediction (Nearest neighbour)
- Model evaluation
- Clustering (K-means, Cobweb)
- Association rules

WEKA (Waikato Environment for Knowledge Analysis) it is a pretty good job for mining data. WEKA it is a product of university WAIKATO (Newzealand) introduced in 1997.The Software was written in Java and contains GUI which is used for interacting data files, it is a automated service side data mining task.

i) The Preprocess of data is done using filtering algorithm.

ii) For the accuracy of predictive model classification and regression model is used.

iii) For studying of mixture of normal distribution clustering technique is used ,that is k-means clustering.

iv) For analyzing of predictive attributes in dataset select attribute is used.

v) Data Visualization is used which is one of the important task in analyzing difficulty of learning problems.

Clustering in WEKA uses the first step in analyzing population after which clustering is applied in order to predict the most crime spot area. The basic approach behind this is to cluster population size, creating classes from cluster, then applying classification to classify records with unknown population size, the classes in cluster is used because classes from cluster are more likely to represent actual population.

V. CONCLUSION AND FUTURE WORK

The study shows the analyze of clustering model for crime pattern detection. The previous work is concentrated only on tracking system to predict crime using tracking of human motion whereas in proposed system we use clustering technique like density based clustering which shows the crime trends ,also this technique gives the accuracy and speed in predicting crime problems. The future work can be concentrated in increasing the effectiveness and efficiency of criminal and intelligence analysis.

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