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CRIMINAL BEHAVIOUR USING MAPPING AND INTRUSION CLASSIFICATION

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ABSTRACT
Data Mining plays a key role in Crime Analysis. There are many different algorithms mentioned in previous research papers, among them are the virtual identifier, pruning strategy, support vector machines, and apriori algorithms. VID is to find a relation between the record and vid. The apriori algorithm helps the fuzzy association rules algorithm and it takes around six hundred seconds to detect a mail bomb attack. In this research paper, we identified Crime mapping analysis based on KNN (K – Nearest Neighbor) and ANN (Artificial Neural Network) algorithms to simplify this process. Crime Mapping is conducted and Funded by the Office of Community-Oriented Policing Services (COPS). Evidence-based research helps in analyzing crimes. We calculate the crime rate based on the previous data using data mining techniques. Crime Analysis uses quantitative and qualitative data in combination with analytic techniques in resolving cases. For public safety purposes, crime mapping is an essential research area to concentrate on. We can identify the most frequently crime-occurring zones with the help of data mining techniques. In Crime Analysis Mapping, we follow the following steps in order to reduce the crime rate: 1) Collect crime data 2) Group data 3) Clustering 4) Forecasting the data. Crime Analysis with crime mapping helps in understanding the concepts and practice of Crime Analysis in assisting police and helps in the reduction and prevention of crimes and crime disorders.

• INTRODUCTION
Crimes are one of the most predominant problems that is happening in most of the urban areas in the world. There are a lot of different types of crimes that happen, including robbery, theft of vehicles, etc. As crime increases, the investigation process gets longer and more complicated. The use of information mining methods helps in resolving the most complicated criminal cases. One of the best methods is crime analysis with crime mapping. Crime analysis with crime mapping helps in understanding the concepts and practices of crime analysis in assisting police and helps in the reduction and prevention of crimes and crime disorders. Crime mapping is conducted and funded by the Office of Community-Oriented Policing Services [1] (COPS). Evidence-based research helps in analyzing crimes. We calculate the crime rate based on the previous data using data mining techniques. Crime analysis uses quantitative and qualitative data and analytic techniques in resolving cases. For public safety purposes, crime mapping is an essential research area to concentrate on. We can identify the highest-risk crime zones with the help of data mining techniques.

• LITERATURE SURVEY
Intrusion detection using data mining techniques.
As the network dramatically extended, security considered as major issue in networks. Internet attacks are increasing, and there have been various attack methods, consequently. Intrusion detection systems have been used along with the data mining techniques to detect intrusions. In this work we aim to use data mining techniques including classification tree and support vector machines for intrusion detection. As results indicate, [2] C4.5 algorithm is better than SVM in detecting network intrusions and false alarm rate in KDD CUP 99 dataset.
In recent years, internet and computers have been utilized by many people all over the world in several fields. In order to come up with efficiency and up to date issues, most organizations rest their

applications and service items on internet. On the other hand, network intrusion and information safety problems are ramifications of using internet. For instance, on February 7th, 2000 the first DoS attacks of great volume where launched, targeting the computer systems of large companies like Yahoo!, eBay, Amazon, CNN, ZDnet and Dadet [3]. In other words, network intrusion is considered as new weapon of world war. Therefore, it has become the general concern of the computer society to detect and to prevent intrusions efficiently. There are many methods to strengthen the network security at the moment, such as encryption, VPN, firewall, etc., but all of these are too static to give an effective protection. However, intrusion detection is a dynamic one, which can give dynamic protection to the network security in monitoring, attack and counter-attack [9]. Thus, Intrusion Detection System (IDS) has been applied to detect intrusion network. Intrusion Detection technology can be defined as a system that identifies and deals with the malicious use of computer and network resources. In the case of detecting data target, intrusion detecting system can be classified as host-based and network-based [7]. • HOST-BASED IDS: Its data come from the records of various host activities, including audit record of operation system, system logs, application programs information, and so on. • NETWORK-BASED IDS: Its data is mainly collected network generic stream going through network segments, such as: Internet packets.

Developing custom intrusion detection filters using data mining

One aspect of constructing secure networks is identifying unauthorized use of those networks. Intrusion detection systems look for unusual or suspicious activity, such as patterns of network traffic that are likely indicators of unauthorized activity. However, normal operation often produces traffic that matches likely "attack signatures"[4], resulting in false alarms. We are using data mining techniques to identify sequences of alarms that likely result from normal behavior, enabling construction of filters to eliminate those alarms. This can be done at a low cost for specific environments, enabling the construction of customized intrusion detection filters. We present our approach, and preliminary results identifying common sequences in alarms from a particular environment.

Fuzzy network profiling for intrusion detection

The Fuzzy Intrusion Recognition Engine (FIRE) is an anomaly-based intrusion detection system that uses fuzzy logic to assess whether malicious activity is taking place on a network. It uses simple data mining techniques to process the network input data and help expose metrics that are particularly significant to anomaly detection. These metrics are then evaluated as fuzzy sets. FIRE uses a fuzzy analysis engine to evaluate the fuzzy inputs and trigger alert levels for the security administrator. This paper describes the components in the FIRE architecture and explains their roles. Particular attention is given to explaining the benefits of data mining and how this can improve the meaningfulness of the fuzzy sets. Fuzzy rules are developed for some common intrusion detection scenarios. The results of tests with actual network data and actual malicious attacks are described. The FIRE IDS [5] can detect a wide-range of common attack types.

Fuzzy cognitive maps for decision support in an intelligent intrusion detection system

The health of a computer network needs to be assessed and protected in much the same manner as the health of a person. The task of an intrusion detection system is to protect a computer system by detecting and diagnosing attempted breaches of the integrity of the system. A robust intrusion detection system for a computer network will necessarily use multiple sensors, each providing different types of information about some aspect of the monitored system. In addition, the sensor data will often be analyzed in several different ways. We describe a decision engine for an intelligent intrusion detection system that fuses information from different intrusion detection modules using a causal knowledge based inference technique. Fuzzy cognitive maps (FCMs) and fuzzy rule-bases are used for the causal knowledge acquisition and to support the causal knowledge reasoning process.

Crime pattern detection using data mining

Data mining can be used to model crime detection problems. Crimes are a social nuisance and cost our society dearly in several ways. Any research that can help in solving crimes faster will pay for itself.

About 10% of the criminals commit about 50% of the crimes[10]. Here we look at use of clustering algorithm for a data mining approach to help detect the crimes patterns and speed up the process of solving crime. We will look at k-means clustering with some enhancements to aid in the process of identification of crime patterns. We applied these techniques to real crime data from a sheriff's office and validated our results. We also use semi-supervised learning technique here for knowledge discovery from the crime records [6] and to help increase the predictive accuracy. We also developed a weighting scheme for attributes here to deal with limitations of various out of the box clustering tools and techniques. This easy to implement data mining framework works with the geospatial plot of crime and helps to improve the productivity of the detectives and other law enforcement officers. It can also be applied for counter terrorism for homeland security.

- **PROBLEM STATEMENT**

Crime has been increasing day by day and everyone in the world is trying to figure out how to manage the crime rate and to work on certain cases, most of the people are trying to store the data for future reference. Human errors can occur at any point of time. There are different types of crimes law enforcement levels, such as traffic violations, sex crime, theft, violent crime, arson, gang/drug offenses, cybercrime[7],[8]. Different crime data mining techniques are proposed among each of them including entity extraction, clustering techniques, Association rule mining. Crime zones can be identified by occurrence of crime, by using hotspots. Patrol is needed at these hotspot areas. The data mining tool helps in reducing the crime rate drastically.

Disadvantage

Security is considered to be a major issue in networks. Analyzing huge amount of data becomes difficult

- **PROPOSED SYSTEM**

Crime Mapping helps in understanding the concepts and practice of Crime Analysis in assisting police and helps in reduction and prevention of crimes and crime disorders using data mining tools. We can use data mining tools involved using ANN [9] (Artificial Neural Networks) and KDD (Knowledge Discovery in Databases).

Advantages

To process huge amounts of data. It is suitable to detect the ignored and hidden information at any point of time.

- **IMPLEMENTATION**

5.1 Admin

In this application admin is a module, here admin can login directly with username and password, after admin login he can upload dataset which is related to crime and can view dataset, these are some operations which are going to done by the admin

5.2.Detector

Here detector is a module, he can directly login with username and password after successful login he can perform some operations such as can view data and make clusters based some selected features and analyze data to detect intrusions and view graphical analysis of intrusions.

- **EXPERMENTAL RESULTS / OUTPUT SCREENS**

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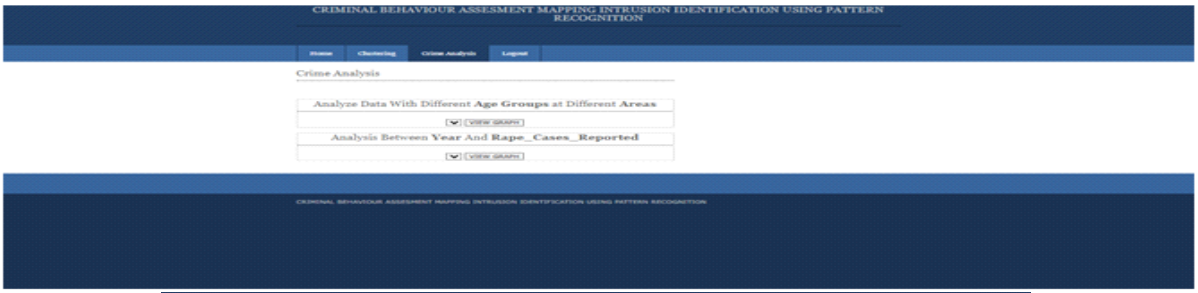

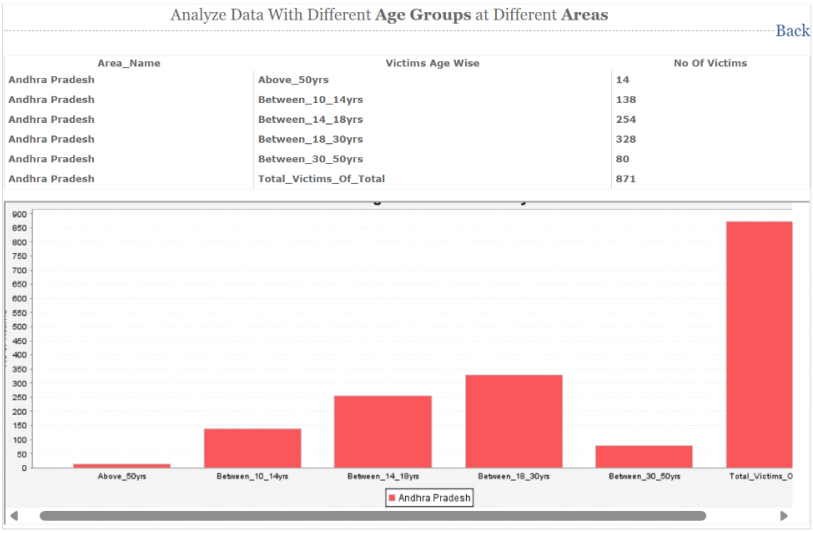

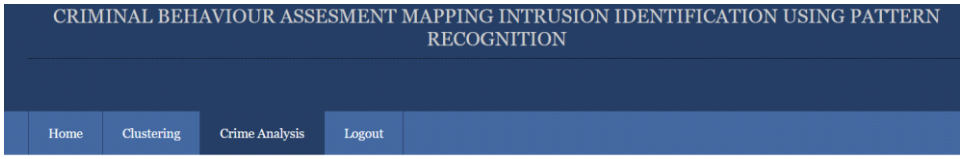

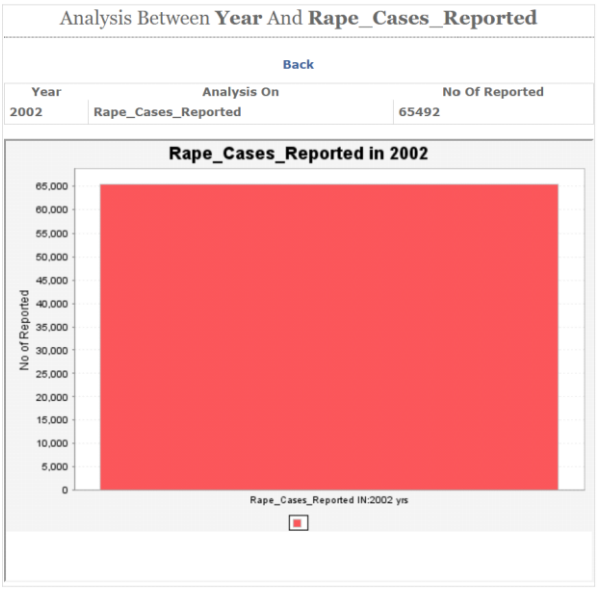

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- **CONCLUSION**

With the assistance of these devices, the wrongdoing information will be nourished to the information digging device for investigation and afterward comes about for two unique models will be recorded. With the assistance of the SAM instrument/tools, we will maintain a strategic distance from the distinction in the outcome and after that the subsequent information will be utilized for the finding the relations amongst those et cetera. Along these lines we will lessen false positives and false negatives in the field of the interruption identification framework utilizing the information mining in the field of wrongdoing information examination.

FUTURE SCOPE:

Assessing and mapping criminal behavior for intrusion detection is an area ripe for future development, especially with advancements in technology and data analytics. Here are some potential future scopes in this field:

- **Machine Learning and AI Integration:** Future advancements in machine learning and artificial intelligence can significantly enhance the accuracy and efficiency of criminal behavior assessment and intrusion detection systems. Algorithms can be trained on large datasets of past criminal activities to identify patterns and anomalies in real-time data streams.
- **Predictive Analytics:** Utilizing predictive analytics, future systems could anticipate potential criminal behavior based on historical data, social factors, and psychological profiles. By analyzing various data sources, including online activities, financial transactions, and sensor data, predictive models can alert authorities to potential threats before they occur.
- **Multimodal Data Fusion:** Integrating multiple data sources, such as video surveillance, social media activity, biometric data, and environmental sensors, can provide a comprehensive understanding of criminal behavior. Future systems could employ advanced techniques for data fusion to extract meaningful insights and detect suspicious activities more accurately.
- **Ethical Considerations:** As these technologies advance, it's essential to address ethical considerations, such as privacy concerns and potential biases in the algorithms. Future research should focus on developing transparent and fair systems that respect individual rights while effectively combating crime.
- **Real-Time Response Systems:** Integrating criminal behavior assessment with real-time response systems can enable rapid intervention and mitigation of security threats. Future developments may include automated response mechanisms, such as deploying security personnel or activating countermeasures based on the severity of the threat.

- **REFERENCES**

- Chen, Hsinchun, et al. "Crime data mining: a general framework and some examples." computer 37.4 (2004): 50-56.
- Ektefa, Mohammadreza, et al. "Intrusion detection using data mining techniques." Information Retrieval & Knowledge Management,(CAMP), 2010 International Conference on. IEEE, 2010.

• Clifton, Chris, and Gary Gengo. "Developing custom intrusion detection filters using data mining." MILCOM 2000. 21st Century Military Communications Conference Proceedings. Vol. 1. IEEE, 2000.
• Dickerson, John E., and Julie A. Dickerson. "Fuzzy network profiling for intrusion detection." Fuzzy Information Processing Society, 2000. NAFIPS. 19th International Conference of the North American. IEEE, 2000.
• Siraj, Ambareen, Susan M. Bridges, and Rayford B. Vaughn. "Fuzzy cognitive maps for decision support in an intelligent intrusion detection system." IFSA World Congress and 20th NAFIPS International Conference, 2001. Joint 9th. Vol. 4. IEEE, 2001.
• Nath, Shyam Varan. "Crime pattern detection using data mining." Web intelligence and intelligent agent technology workshops, 2006. wi-iat 2006 workshops. 2006 ieee/wic/acm international conference on. IEEE, 2006.
• Florez, German, S. A. Bridges, and Rayford B. Vaughn. "An improved algorithm for fuzzy data mining for intrusion detection." Fuzzy Information Processing Society, 2002. Proceedings. NAFIPS. 2002 Annual Meeting of the North American. IEEE, 2002.
• Panda, Mrutyunjaya, and Manas Ranjan Patra. "A comparative study of data mining algorithms for network intrusion detection." Emerging Trends in Engineering and Technology, 2008. ICETET'08. First International Conference on. IEEE, 2008.
• Vaidya, Jaideep, and Chris Clifton. "Privacy-preserving data mining: Why, how, and when." IEEE Security &Privacy 2.6 (2004): 19-27.
• Mukkamala, Srinivas, Guadalupe Janoski, and Andrew Sung. "Intrusion detection using neural networks and support vector machines." Neural Networks, 2002. IJCNN'02. Proceedings of the 2002 International Joint Conference on. Vol. 2. IEEE, 2002