

Criminal Investigation Tracker with Suspect Identification

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Abstract - Whenever a case against the crime is filed the investigation always starts from the scratch right away from the evidences found at the crime location and the eye witnesses present at the crime location. On the basis of the statement given by the eye witnesses about the crime and the criminal who committed that crime. The process of the investigations starts. As to reduce the stress of the police officers we implemented a system as criminal investigation tracker with suspect identification that will help the officers to speed up the process of investigation and track status of ongoing case by predicting out the primary suspects on the basis of the records which consists of compendium of the people associated to the case, former criminal background proofs recovered from crime location, etc. This digitized system makes the work easy for an officer to check the status of the case online and even allows him to add up the new important information related to the case as it's when needed. The proposed system consists of suspect prediction algorithm to predict and suggest the suspects in the logical order.

I. INTRODUCTION

We here propose a criminal investigation tracker system that tracks the investigation status of criminal cases with logs and also predicts primary suspects. The system is proposed to help agencies like CBI, CID and other such bureau's to speed up investigation process and track status of multiple cases at a time. The system keeps logs of a case which includes case summary, people involved, disputes, past criminal history of those involved, Items recovered on scene and other details. The system realizes the type of case, allows admin to update the status of investigation, upload more images of crime, items found on scene etc. This allows authorized officers to check case status and look into its status online and also update any important info as and when needed. The system also consists of a suspect prediction algorithm. Based on type of case, property, land, love or other entities involved the system studies past cases, it studies past criminal records of those involved and based on this data it provides suggestions of suspected persons in a logical order. The system is designed to aid investigation teams to work collectively on cases, coordinate and also speed up the process by suggesting logical suspects based on data provided.

[1] Dongyuan Li, Xiaojun Bai "Criminal Investigation Image Retrieval Based on Deep Learning", 2020 International Conference on Computer Network, Electronic and Automation (ICCNEA) In this paper CSI image retrieval technology based on low-level features uses a content-based

image retrieval (CBIR) framework to extract low-level features of the image or to fuse different low-level features, which confirms the feasibility of CBIR technology in CSI image retrieval.

The author proposes to combine low level features of image dominant color descriptors as color features, gray-level co-occurrence matrix as texture features to improve CSI image retrieval performance.

Advantage:

Final experimental results show that the algorithm can effectively describe the content of CSI image and maintain a high average precision.

[2] Bagus Priambodo, Yuwan Jumaryadi, Zico Pratama Putra "Comparison of Local Binary Pattern and Eigenfaces for Predict Suspect Positive Drugs" 2020 2nd International Conference on Broadband Communications, Wireless Sensors and Powering (BCWSP). In this paper The dataset is generated from online sources by collecting and pre-processing 30 images of people before and after drug. We compare two algorithm local binary pattern and Eigenfaces for predicting suspect positive drugs based on face images. The experiment shows that the result of the prediction using Local binary pattern is better than the prediction using Eigenfaces. However, a higher accuracy of prediction reaches only 75 %.

Advantage:

Local binary pattern is better than the prediction using eigenfaces.

[3] Neil Veira, Student Member, IEEE, Zissis Poulos, Member, IEEE, and Andreas Veneris, Senior Member, IEEE "Searching for Bugs using Probabilistic Suspect Implications" IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (Volume: 39, Issue: 12, Dec. 2020). In this paper Due to the excessive cost associated with manual RTL design debugging, automated tools are often employed to identify a set of suspect bug locations. behaviour of these tools allows partial results to be analyzed before the suspect search is complete. In this paper proposes a new SAT-based debugging algorithm which predicts where solutions are most likely to be found and prioritizes examining these locations.

Advantage:

This debugging algorithm is proven to be better than the VLSI models reaching an accuracy rate of 87 percent.

[4] Both Warm And Cold Start Users Anupriya Gogna, Angshul Majumdar "A Comprehensive Recommender System Model" 2019 International Conference on Innovative Trends in Computer Engineering (ITCE'2019). In this paper, we utilize secondary information pertaining to user's demography and item categories to enhance prediction accuracy. Within the matrix factorization framework, we introduce additional supervised label consistency terms that match the user and item factor matrices to the available secondary information (metadata). Matrix factorization model—conventionally employed in collaborative filtering techniques—yields dense user and dense item factor matrices.

Advantage:

Recommender systems (RS) help mitigate the problem of information overload by saving users from the discouraging job of filtering through huge pile of information/ items, and finding the relevant.

[5] Neil Veira, Student Member, IEEE, Zissis Poulos, Member, IEEE, and Andreas Veneris, Senior Member, IEEE "Suspects Prediction towards Terrorist Attacks Based on Machine Learning" 2019 5th International Conference on Big Data and Information Analytics (BigDIA). In this paper, Aiming at suspects prediction of terrorist attacks, five methods based on machine learning are used to sort the recorded data of terrorist attacks quantitatively. Based on Logical Regression, Decision Tree, Gaussian Bayesian Network, AdaBoost and Random Forest fitting model, the terrorist attacks recorded, Global Terrorism Database (GTD), The most likely suspects for each attack and the possibility of these attacks are predicted.

Advantage:

Good predictive capabilities based on the automated analysis of less intrusive data could be part of sensible restrictions on disproportionate use of measures that present greater threats to privacy and other associated freedoms.

[6] Neil Veira, Zissis Poulos and Andreas Veneris "Suspect Set Prediction in RTL Bug Hunting" 2018 Design, Automation & Test in Europe Conference & Exhibition (DATE). In this paper, The proposed method involves learning design component dependencies by using historical debugging data and representing these dependencies by means of a probabilistic graph.

Using this representation, one can run a debugging tool non-exhaustively, obtain a partial set of potentially erroneous components and then predict the remaining by applying a cost-effective belief propagation pass.

Advantage:

The method can reduce debugging runtime when it comes to multiple debugging sessions by 15x on the average while achieving a 91% average prediction accuracy.

[7] Barone P.M ;Di Maggio R.M ;Ferrara C "Not necessarily buried bodies: Forensic GPR investigations from criminal to civil justice" 2015 8th International Workshop on Advanced Ground Penetrating Radar (IWAGPR). In this paper, Geophysical techniques, such as Ground Penetrating Radar (GPR), have been successfully used during forensic

investigations to locate graves and buried bodies. Geophysical methods have the capability to aid the research and recovery of these targets because they can investigate large areas non-destructively and rapidly where a forensic target was hidden in the subsoil.

Advantage:

The results showed the various possibilities in which forensic GPR investigations can help in criminal and civil justice at the same level of high standards and with the same distinguished results.

[8] Benjamin C. M. Fung, Mourad Debbabi, Rabia Batool, Andrew Marrington, Farkhund Iqbal "Wordnet-Based Criminal Networks Mining for Cybercrime Investigation" 2014 IEEE Security and Privacy Workshops. In this paper, To combat the increasing number of criminal activities, we propose a framework to analyze chat logs for crime investigation using data mining and natural language processing techniques. The proposed framework extracts the social network from chat logs and summarizes conversation into topics.

Advantage:

Domain knowledge can be a word taxonomy used in malicious online conversations that represents street terms of certain crimes.

[9] Daigo Muramatsu ; Yasushi Makihara ; Haruyuki Iwama ; Takuya Tanoue ; Yasushi Yagi "Gait Verification System for Supporting Criminal Investigation" October 18, 2013, Information Processing Society Of Japan. In this paper, Usability intended for the non-gait-specialist: The system has a graphics-user interface (GUI) so that a user, who has no specialist knowledge of computer vision-based gait analysis.

Objective output: The verification result is output in the form of the posterior probability. In the one-to-one verification function, a pair of subjects is matched and a corresponding posterior probability is output.

Applicability to various circumstances: They have introduced the view transformation model-based gait feature matching framework to realize the cross-view verification which extremely enhances the practical value of the system.

Advantage:

This is the first gait verification system for criminal investigation. The system was designed so that criminal investigators as non-gait-specialists could obtain without assistance vision-based gait verification results between perpetrators and suspects.

[10] Haithem Ayari, Florence Azais, Serge Bernard, Mariane Comte, Vincent Kerzerho, Olivier Potin and Michel Renovell "On the use of redundancy to reduce prediction error in alternate analog/RF test" IEEE 18th International Mixed-Signal, Sensors, and Systems Test Workshop, 2012. In this paper, A promising approach is to adopt alternate test strategy, i.e. a strategy in which test results are derived from indirect low-cost measurements. Use only indirect measurements to predict device specifications during production testing.

Advantage:

Manufactured circuits as good or bad regarding its datasheet.

II. METHODOLOGY

The system and for the case whereas in another attribute i.e. the view case attribute here, the **admin** can be able to view the cases present. In the **Police Login**, we have attribute as **Add new criminal** where we have to add the criminal name, address, age, gender, type of crime, location, evidence, crime month, crime year, time of day, suspect image by this the criminal information gets added to the system. At the next level i.e. **Add new fir**, the police adds the details of the case name i.e. what type of crime has happened, **the name of the victim, type of crime, location and evidences** that are been found on the location of the crime. Here, in this page we get the prediction about the suspect by using the algorithm known as **Decision Tree algorithm**. Another attribute is about the **case enquiry**, where the police can access the information about the case and can get the advanced information about the probable suspect of the case. The next attribute is the **Final case**, here in this we have to select the case name and we'll get the status of the case i.e. whether the case is completed or it is pending. Then at the detail of the case i.e. the suspect information we have an option i.e. to add the case for investigation or not and when we add the case for investigation we get the prediction about the crime that who is the major suspect in the crime. The final and the important attribute is the **prediction part**, here there are three main attributes i.e. we have to enter the type of crime, location and evidence of the case and when we'll click on the search button the result will be generated to us.

III. PROPOSED SYSTEM

The fundamental part of a criminal investigation is in finding out the probable suspects involved in a crime. This can be further enhanced by linking the crimes which have been committed in the past and by the nature of crime. In this study we have developed a novel soft system methodology (SSM) to identify the most probable suspects involved in a crime. This methodology also helps to automate the system that can be applied to various scenarios. Also with the use of Mobile GIS, we can analyze suspect's journey to crime by analyzing the cell tower records of the crime location. Call detail records of the victim's phone are analyzed to understand their recent contacts.

Proposed system merits:

- Admin can check out past events from the System.
- Admin can get all information on just a click.
- We can use previous crime reports with just few clicks.

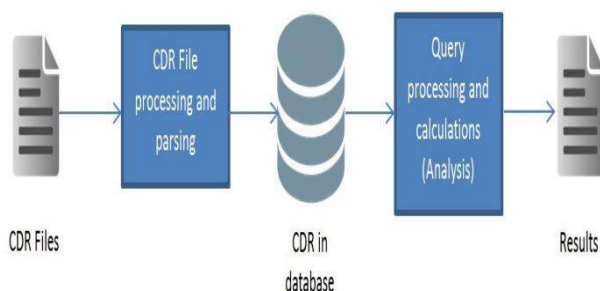


Fig 1. System Design

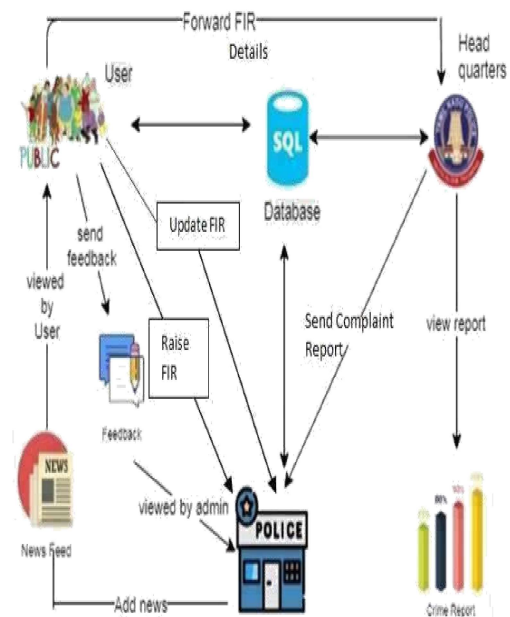


Fig 2. Architecture Diagram

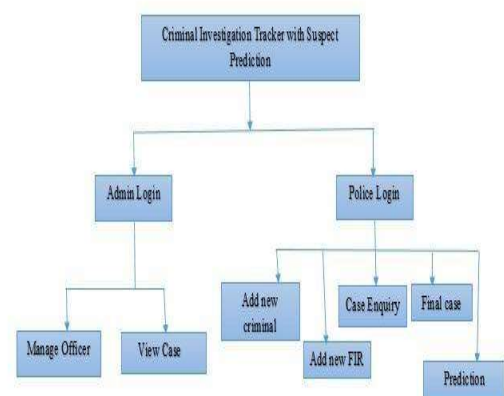


Fig 3. System Flow Diagram

IV. CONCLUSION

In our system, a completely integrated and compact system is developed that can be used by the common man as well as the police and this system would be like a win-win situation for both of them. This project will be widely used in the future by the police department, the common man, security agencies and even hospitals (for accident and assault victims). The greatest strength of this project is that it offers new features as well as retaining the original characteristics of the existing systems (for example: Criminal Database). An endeavor has been made in this paper to propose a tracker system framework which is sufficient to recognize the criminal through the dialog with the victims to help the law enforcement activities. Precision and accuracy of the proposed system is highly dependent on the perception of the eye witnesses.

REFERENCES

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