

EXTRACTING FACIAL FEATURES WITH FACE MATCHING DETECTION OF CRIMINALS

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Abstract

There is an abnormal increase in the crime rate and also the number of criminals is increasing, this leads towards a great concern about the security issues. Crime preventions and criminal identification are the primary issues before the police personnel, since property and lives protection are the basic concerns of the police but to combat the crime, the availability of police personnel is limited. To avoid this situation an automated facial recognition system for criminal identification is proposed using Haar feature-based cascade classifier. This paper presents a real-time face recognition using an automated surveillance camera. This system will be able to detect and recognize face automatically in real-time. With the advent of security technology, cameras especially CCTV have been installed in many public and private areas to provide surveillance activities. The footage of the CCTV can be used to identify suspects on scene. In this paper, an automated facial recognition system for criminal database was proposed using known Haar feature-based cascade classifier. This system will be able to detect face and recognize face automatically in real time. An accurate location of the face is still a challenging task. Viola-Jones framework has been widely used by researchers in order to detect the location of faces and objects in a given image. Face detection classifiers are shared by public communities, such as OpenCV.

Keywords: Facial Detection, Find Criminals Face

1. INTRODUCTION

1.1 PURPOSE

Criminal record contains personal information about a particular person along with photograph. To identify any criminal we need identification regarding that person, which are given by the eyewitness. Identification can be done by finger print, eyes, DNA etc. One of the applications is face identification. The face is our primary focus of attention in social intercourse playing a major role in conveying identity and emotion. Although it is difficult to infer intelligence or character from facial appearance, the human ability to remember and recognize faces is remarkable.

1.2 FACE RECOGNITION

A face recognition system uses a database of images and compares another image against those to find a match, if one exists. For each facial image, identification can be done using the RGB values for the eye color, the width and height of the face and also using various ratios. Key goal of computer vision researchers is to create automated face recognition systems that can equal, and eventually surpass, human performance. To this end, it is imperative that computational researchers know of the keyfindings from experimental studies of face recognition [1]. These findings provide insights into the nature of cues that the human visual system relies upon for achieving its impressive performance and serve as the building blocks for efforts to artificially emulate these abilities. The face recognition problem has been studied for more than two decades. The approaches proposed in the literature so far can mainly be classified into two categories:

model based and appearance. The model based method tries to extract geometrical parameters measuring the facial parts while the appearance based approach use the intensity or intensity-derived parameters such as eigen faces coefficients to recognize faces. Due to the changes of lighting condition, expression, occlusion, rotation, etc., the human face appearance could change considerably. There are existing approaches proposed to recognize faces under varying pose. One is the Active Appearance Model which deforms a generic face model to fit with the input image and uses the control parameters as the feature vector to be fed to the classifier. The second approach is based on transforming an input image to the same pose as the stored prototypical faces and then using direct template matching to recognize faces, and later extended.

1.3 DESCRIPTION

This system is aimed to identify the criminals in any investigation department. In this system, we are storing the images of criminals in our database along with his details and then these images are segmented into four slices- forehead, eyes, nose and lips. These images are again stored in another database record so as to make the identification process easier. Eyewitnesses will select the slices that appear on the screen and by using it we retrieve the image of the face from the database. Thus this system provides a very friendly environment for both the operator and the eyewitness to easily identify the criminal, if the criminals record exists in the database. This project is intended to identify a person using the images previously taken. The developed system is also a first milestone for video based face detection and recognition for surveillance

2.LITERATURE SURVEY

2.1 COLLABORATIVE FILTERING-BASED RECOMMENDATION OF ONLINE SOCIAL VOTING

Social voting is an emerging new feature in online social networks. It poses unique challenges and opportunities for recommendation. In this paper, we develop a set of matrix-factorization (MF) and nearest-neighbor (NN)-based recommender systems (RSs) that explore user social network and group affiliation information for social voting recommendation. Through experiments with real social voting traces, we demonstrate that social network and group affiliation information can significantly improve the accuracy of popularity-based voting recommendation, and social network information dominates group affiliation information in NN-based approaches. We also observe that social and group information is much more valuable to cold users than to heavy users. In our experiments, simple metapath-based NN models outperform computation-intensive MF models in hot-voting recommendation, while users' interests for nonhot votings can be better mined by MF models. We further propose a hybrid RS, bagging different single approaches to achieve the best top-k hit rate.

2.2 A SECURE VERIFIABLE RANKED CHOICE ONLINE VOTING SYSTEM BASED ON HOMOMORPHIC ENCRYPTION

Advanced security methods are necessary to introduce effective online voting in the whole world. Elections conducted on paper consume a lot of resources and contribute to the destruction of forests, which leads to climate deterioration. Recent online voting experiences in countries, such as the United States, India, and Brazil, demonstrated that further research is needed to improve security guarantees for future elections, to ensure the confidentiality of votes and enable the verification of their integrity and validity. In this paper, we propose a ranked choice online voting system, which addresses these challenges. It eliminates all hardwired restrictions on the possible assignments of points to different candidates according to the voters' personal preferences. In order to protect the confidentiality of the votes, each cast ballot is encrypted using the exponential ElGamal cryptosystem before submission. Furthermore, during voting the system

ensures that proofs are generated and stored for each element in the cast ballot. These proofs can then be used to verify the correctness and the eligibility of each ballot before counting without decrypting and accessing the content of the ballot. This validates the votes in the counting process and at the same time maintains confidentiality. The security and performance analyses included in this paper demonstrate that our method has achieved significant improvements in comparison with the previous systems. The outcomes of our experiments also show that our proposed protocols are feasible for practical implementations

2.3 UNDERSTANDING CONTENT VOTING BASED ON SOCIAL FORAGING THEORY

Why do people want to vote for or against content at some online communities and not at others? Social foraging theory, particularly research on insect and other animal information sharing behavior, offers a new perspective. Borrowing concepts from social foraging theory, this study proposes that four factors drive people's intention to vote online content (positively or negatively): 1) altruistic motives; 2) identification with the community; 3) information quality; and 4) knowledge self-efficacy. The research model was tested in a survey of online news communities. It found that positive voting intention was predicted by altruistic motives, community identification, and knowledge self-efficacy. Information quality is important for positive voting, but it works indirectly through fostering stronger community identification. Negative voting intention was predicted by altruistic motives and information quality. Prior research has applied foraging theory to individuals acting alone, e.g., when an individual uses Google to search for information online. This study expands the application of foraging theory to the community context where individuals provide votes to influence others in their chosen community. The findings advance our knowledge about content voting and provide implications for practitioners of voting systems.

2.4 ENHANCED-ONLINE-RANDOM-FOREST MODEL FOR STATIC VOLTAGE STABILITY ASSESSMENT USING WIDE AREA MEASUREMENTS

Application of data mining based methods in online voltage stability assessment has attracted vast attentions in recent years. To account for significant system changes, most of the data mining based methods reconstruct an entire model based on the updated training database. Instead of entirely rebuilding a model in offline mode, this paper presents a novel online learning framework for monitoring the voltage stability of a transmission grid using wide area measurements. A new enhanced online random forest model based on the drift detection and online bagging techniques is proposed. It enables to online update the trees involving tree growth and/or tree replacement. The trees in the forest are then combined via a weighted majority voting, which makes the decision model better adapted to system changes. The framework was first demonstrated on the IEEE 57-bus system, and then applied to a practical power system, the Taiwan power (Taipower) system composed of 1821 buses. In addition to accuracy-based measures, robustness and speed of the proposed framework were also validated. Extensive studies demonstrate that the proposed framework is able to provide reliable and accurate online voltage stability assessment.

4. PROPOSED SYSTEM

In our proposed system, a wide presentation of the face domain adaptation and detection has been added. The implementation will be given with two order: identification of the criminals and identification of the missing person with the face recognition. Here the ordered frame based conversion is adapted with the HAAR cascades feature point extraction system. Feature extraction domain has plenty of collection of generalized face features from several images of the same subject. Then, each face image is processed, features are extracted and the collection of features are analyzed and combined into a single generalized features collection, which is written to the database. The face is our primary focus of attention in social inter course playing a major role in conveying identification and emotion. Although the ability to infer intelligence or character from facial appearance is a guess but still the human ability to recognize faces is remarkable. This analogy would give us enough scope to envisage a new algorithm. There are mainly three

important ways in construction of the face i.e., by using the eyewitness function, adding details and clipping image. This offers us a face as finally identification parameter to know who has committed the crime.

5.SYSTEM ARCHITECTURE DIAGRAM

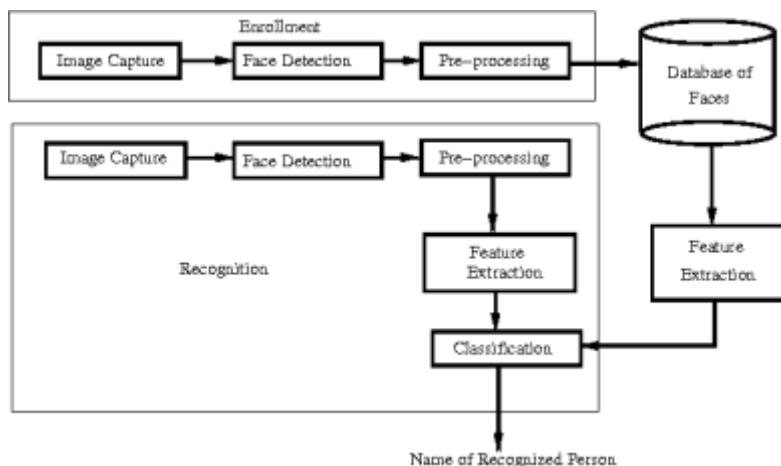


FIG 1- SYSTEM ARCHITECTURE DIAGRAM

5.1 DATA FLOW DIAGRAM

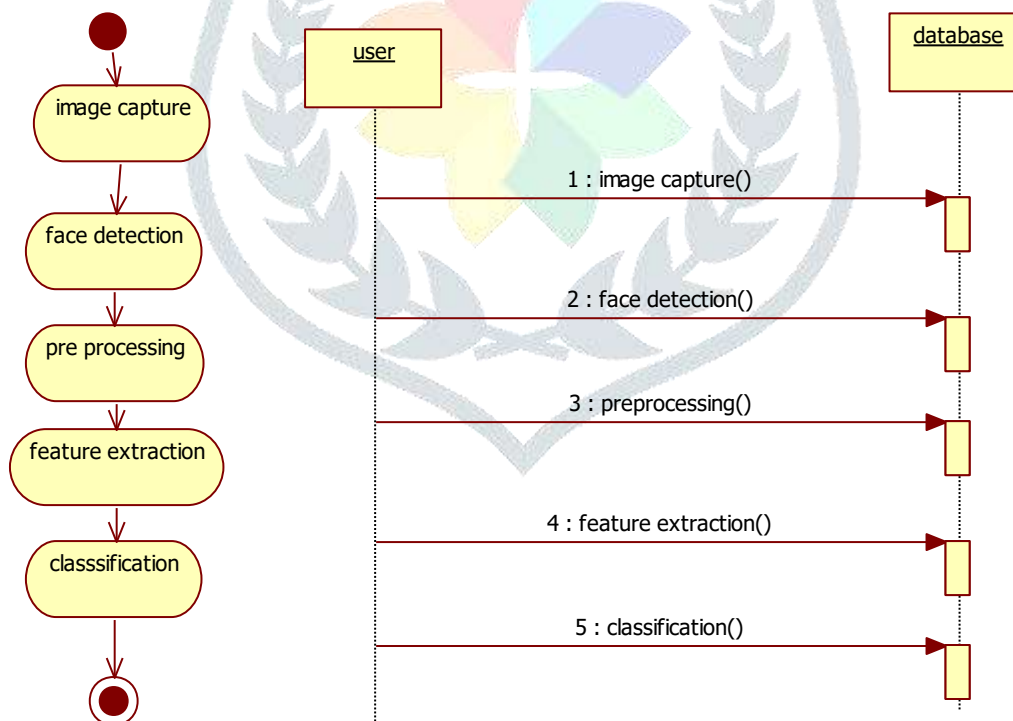


FIG 2 – DATA FLOW DIAGRAM

6 SOFTWARE TESTING AND IMPLEMENTATION

System testing is the stage of implementation, which is aimed at ensuring that the system works accurately and efficiently before live operation commences. Testing is vital to the success of the system. System testing makes a logical assumption that if all the parts of the system are correct, the goal will be successfully achieved. System Testing is a type of software testing that is performed on a complete integrated system to evaluate the compliance of the system with the corresponding requirements. System testing detects defects within both the integrated units and the whole system. The result of system testing is the observed behavior of a component or a system when it is tested. System Testing is basically performed by a testing team that is independent of the development team that helps to test the quality of the system impartial. The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, subassemblies, assemblies and/or a finished product. It is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of test. Each test type addresses a specific testing requirement.

6.1 OBJECTIVES OF TESTING

Testing is the process of executing a program with the intent of finding an error.

A successful test is one that uncovers a discovered the error.

6.2 UNIT TESTING

Unit testing focuses verification efforts on the smallest unit of software design, the module. This is also known as “module testing”. The modules are tested separately. This testing is carried out during programming stage itself. In this testing step, each module is found to be working satisfactorily as regard to the expected output from the module.

6.3 INTEGRATION TESTING

Data can be lost across an interface; one module can have an adverse effect on others; sub-functions when combined may not produce the desired major functions; integration testing is a systematic testing for constructing the program structure. While at the same time conducting to uncover errors associated within the interface? The objective is to take unit tested modules and to combine them and test it as a whole. Here correction is difficult because the vast expenses of the entire program complicate the isolation of causes. This is the integration-testing step; all the errors encountered are corrected for the next testing step.

6.4 VALIDATION TESTING

Verification testing runs the system in a simulated environment using simulated data. This simulated test is sometimes called alpha testing. This simulated test is primarily looking for errors and monitions regarding end user and decisions design specifications hat where specified in the earlier phases but not fulfilled during construction.

Validation refers to the process of using software in a live environment in order to find errors. The feedback from the validation phase generally produces changes in the software to deal with errors and failures that are uncovered. Than a set of user sites is selected that puts the system in to use on a live basis. They are called beta tests.

The beta test suits use the system in day to day activities. They process live transactions and produce normal system output. The system is live in every sense of the word; except that the users are aware

they are using a system that can fail. But the transactions that are entered and persons using the system are real. Validation may continue for several months. During the course of validating the system, failure may occur and the software will be changed. Continued use may produce additional failures and need for still more changes.

6.5 OUTPUT TESTING

After performing the validation, the next step is output testing of the proposed system, since no system could be useful if it does not produce the required output in the specified format. Asking the users about the format required by them tests the output generated or displayed by the system under consideration. Hence the output format is considered in two ways-one is on screen and another in printed format.

7. CONCLUSION

In this project, we implemented a facial recognition system using a global-approach to feature extraction based on Histogram-Oriented Gradient. We then extracted the feature vectors for various faces from the AT&T and Yale databases and used them to train a binary-tree structure Haar Cascades learning model. Running the model on both databases resulted in over 90% accuracy in matching the input face to the correct person from the gallery. We also noted one of the shortcomings of using a global approach to feature extraction, which is that a model trained using a feature vector of the entire face instead of its geometrical components makes it less robust to angle and orientation changes. However, when the variation in facial orientation is not large, the global-approach is still very accurate and simpler to implement than component-based approaches.

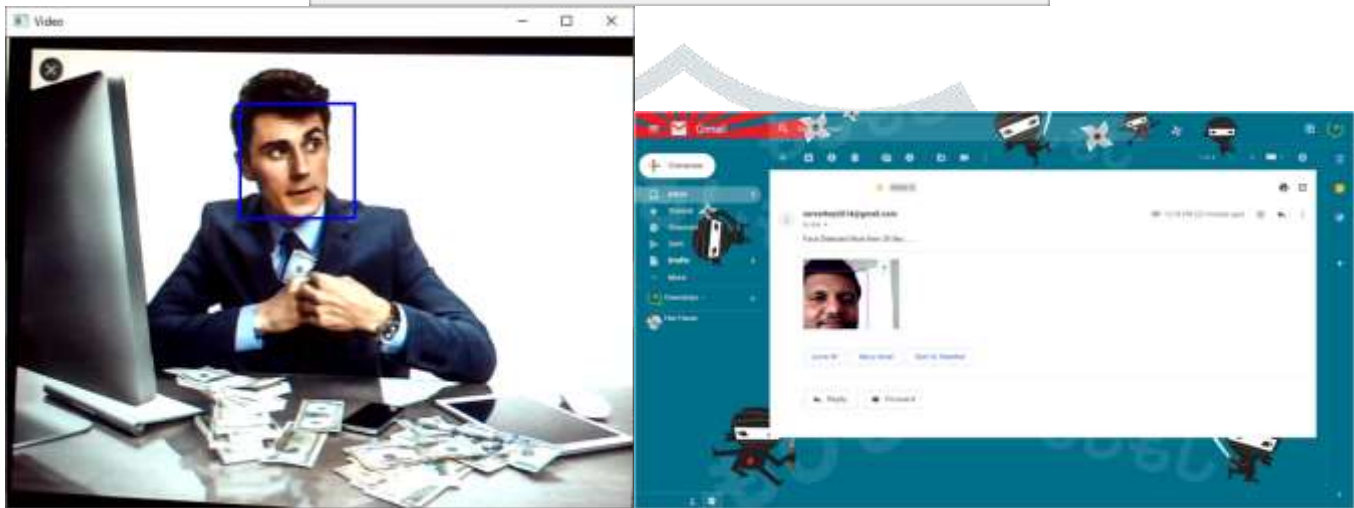
8. RESULTS

The developed system will be made with the criminals detection and missing person identification

The accuracy of the face matching algorithm and classification system is good enough compared with all other algorithms

The implementation can be carried out with the specific identification of multiple levels.

9. SCREENSHOTS



10. REFERENCES

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