

CCTV CAMERAS AND FACE RECOGNITION

PROBLEM STATEMENT:

CCTV CAMERAS AND FACE RECOGNITION BY FILTERING IN WELFARE ORGANIZATIONS AND SOFTWARE SECTOR.

IN DETAIL:

This application can recognize the face in CCTV footage and availability of this could be useful for searching or identifying a person in any organizations such as education and software sectors.

INTRODUCTION:

CCTV cameras are fitted on our every building but video footage from them are currently just dumped. No application is available which can automatically recognize a facial images in CCTV footage and compare it with the photo database of our employees to identify the person in real time. With the existing applications in order to recognize the face of a person they go through the complete video and recognize the person manually with the photos they have. This application is used to recognize the photos from database in different possible forms(different angles of image ,features) in CCTV footage automatically.

PURPOSE:

Availability of such an application could be useful for security reasons to identify visitors/trespassers. We will observe this situations in companies, institutions and welfare organizations. This can be used to locate the position of staff in our premises, who is not on his seat and required urgently at some place.

INTENDED AUDIENCE:


Group of employees , public people and all visitors of organizations.

SCOPE:

Face recognition, as one of the most successful applications of image analysis , has recently gained significant attention. Research in automatic face recognition has been conducted since the 1960s, but the problem is still largely unsolved. Last decade has provided significant progress in this area owing to advances in face modeling and analysis techniques. Although systems have been developed for face detection and tracking, reliable face recognition still offers a great challenge to computer vision and pattern recognition researchers.

OVERALL DESCRIPTION:


This project requires the students to apply their abilities to handle image capture hardware and software. Since face recognition is an active area of research, you will need to perform a literature survey and discuss (through brainstorm sessions) the relative



performance of each of the techniques that you have investigated. You will then be in position to design and implement pre-processing and recognition code to perform face recognition. As a starting point, it is necessary that you familiarise yourselves with some of the basic concepts of image processing. These techniques are called deep FR. The evolution of the FR is around network architectures and loss functions. Deep face model trained on the large dataset. We often lack resources to learn a complex model with minimal training samples for a specific face recognition task. Therefore, using the pre-trained model as transfer learning is usually applied. IN this project we load the database images for a footage and recognize the person easily whenever we want and whatever the situation.

SYSTEM FEATURES AND REQUIREMENTS:

Operational Requirements:

- a) Purpose(s) of the surveillance.
 - b) Potential threat or activity to be monitored and/or recorded.
 - c) Determination of the zones or objects requiring surveillance.
 - d) Determination of the number of cameras, and their locations, required to monitor the agreed zones and objects.
 - e) Intended target(s) of the surveillance and the frame rate appropriate to the target's speed within the location under surveillance.
 - f) Response required on detection of an event.
 - g) Manner in which images will be viewed and recorded.
 - h) How data will be exported from the system to permanent record.
 - i) Individuals who will require access to the recorded data.
 - j) Selection of cameras and equipment depending on the operating environmental conditions.
 - k) Control centre configuration including secure location of control equipment.
 - l) Power supplies; the use of a mini UPS System should be considered in situations where there is no UPS in place.
 - m) Functional and operating procedures.
 - n) Maintenance and repair.
 - o) Evaluation of existing lighting and consideration of new or additional illumination including the use of Infra Red cameras or lamps.
 - p) Image resolution required.
 - q) Determination of the most appropriate transmission method to be utilised.
 - r) Compression technique to be used in recording (where appropriate)
- 

NON- FUNCTIONAL REQUIREMENTS:

Nonfunctional requirements define the needs in terms of performance, logical database requirements, design constraints, standard compliance, reliability, availability, security, maintainability and portability. SOFTWARE AND HARDWARE INTERFACE

Stereo cameras, associated software, internet connection :

1. PC Workstations with digital capture facilities, video editing software and/or MATLAB®.
2. Sufficient storage access for media files.

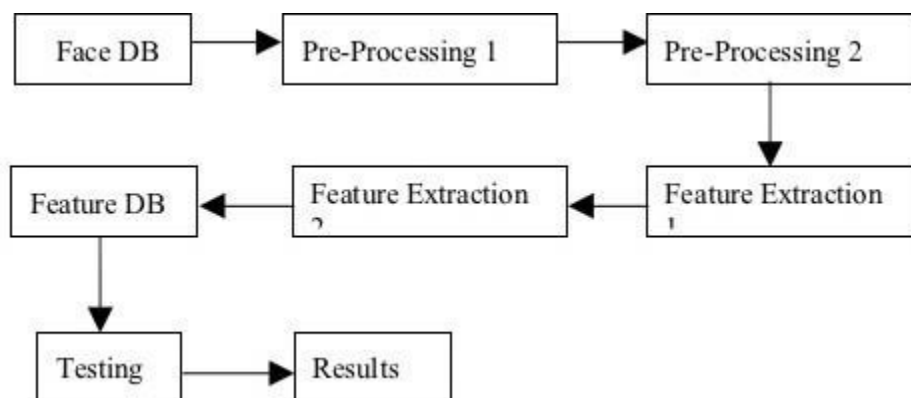
Detailed tasks:

1. Face database (DB) extension using your faces captured with stereo camera.

Choose 10 appropriate views from the video sequence. Add this to the existing 2 face DB you already have.

There must be sufficient overlap between the samples chosen, yet they should look different from the previous sample. Higher marks awarded for right choice of samples chosen.

2. Building 2 pre-processing tasks on images as a sequential operation.



By sequential operation it is meant that the task must be carried out on the previous operation results and not on the original face images. For example, in figure above, pre-processing2(block 3) must be carried out on the results of pre-processed1 images(block2) and NOT on the Face DB(block1). Higher marks awarded for such careful operation.

3. Building 2 feature extraction tasks on (2) as a sequential operation.

4. Building recognition tasks on (3)

5. planning and performing different tests on the DB.



Perform the following tests:

You may need to have separate directories for DB and query images.

a.Test1: Test all known samples. Samples are different views of the same person.

b.Test2: Test unknown subject by taking some images of your classmates.

c.Test3: Test unknown subject by taking some images of your classmates.

Expected Results:

a.Test1: Very good performance

b.Test2: Should still recognize well.

c.Test3: Should reject these images.

SYSTEM FUNCTIONS:

A face recognition system uses biometrics to map facial features from a photograph or video. It compares the information with a database of known faces to find a match. Facial recognition can help verify personal identity, but it also raises privacy issues.

The Risks and Challenges of Facial Recognition Technology:

1. Not So Easy
2. Controlled Environments
3. Audience Participation
4. Privacy Concerns

Minimizing Risk in the Face of Increasing Liability:

1. The Rise of Biometric Privacy Regulation (And Corresponding Risk)
 2. Biometric Data/Facial Recognition Privacy Policy
 3. Data Security Measures
- 

