



# Models for Person Re-Identification Learned from Videos with Weak Supervision

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**Abstract:** Person re-identification aims to recognize or re-identify a person who was previously seen in video captured with overlapping or disjoint field of views. It has several applications in video surveillance, like tracking people in a crowd as they move across field of views of different cameras or in and out of the same camera's field of view. Re-identification allows us to reduce the possibility of identity switches by exploiting the appearance of a person to re-identify him/her again and it like a person re-identification has been extended to the problem of tracking multiple players in sports videos whose paths may intersect and cause identity switches. This is a challenging problem due to occlusions and variations in illumination and pose caused by difference in viewing angle and lighting conditions as the person moves in a scene or from one field of view to another and use appearance cues like color histograms, jersey numbers and facial recognition to reduce identity switches.

## I. INTRODUCTION

To collect a vehicle dataset VAC21 and carefully label 21 classes of structure attributes. With the constructed dataset, we apply the state-of-art one-stage detection method SSD as a baseline model for attribute detection. To make improvements by adding proposals from low-level layers to improve the accuracy of detecting small objects. Furthermore we employ the focal loss to improve detection accuracy then we propose a novel ROIs-based vehicle re-identification and retrieval method and conduct a series of experiments. The experimental results show that our method outperforms state-of-the-art methods in the literature.

## DISADVANTAGES OF EXISTING SYSTEM

- It has not done development trends are discussed.
- It has not make a systematic review of smart contracts and identify some research gaps .

## 4.3 PROPOSED SYSTEM

- Person re-identification (re-ID) has become increasingly popular in the community due to its application and research significance.
- It spots a person of interest in other cameras. It have witnessed the emergence of large-scale datasets and deep learning systems which make use of large data volumes.
- Considering we have to find motion detection because if anyone cross the camera it first recognized motion then face after that face

identification. We have already store image dataset including project.

- The camera identify whether the person has already present or not by using that dataset.

## ADVANTAGE OF PROPOSED SYSTEM

- Increasing throughput & reducing subjectiveness arising from human experts in detecting the face.

## MODULE DESCRIPTION

### Person face recognition from given input image:

The face can be considered as the unique identity of an individual. People across the world have unique faces and facial features. It plays a major role in interacting with other people in society. Considering these facts, facial recognition is implemented in the real world. A Haar wavelet is a mathematical fiction that produces square-shaped waves with a beginning and an end and used to create box shaped patterns to recognise signals with sudden transformations. To analyses an image using Haar cascades, a scale is selected smaller than the target image. It is then placed on the image, and the average of the values of pixels in each section is taken. If the difference between two values pass a given threshold, it is considered a match. Face detection on a human face is performed by matching a combination of different Haar-like-features.

### To capture the faces from given video for training purpose:

OpenCV enables the creation of XML files to store features extracted from datasets using the FaceRecognizer class. The stored images are imported, converted to grayscale and saved with IDs in two lists with same indexes. FaceRecognizer objects are created using face recogniser class. Face recogniser object is created using



the desired parameters. Face detector is used to detect faces in the image, cropped and transferred to be recognised. This is done using the same technique used for the image capture application. For each face detected, a prediction is made using FaceRecognizer.predict() which return the ID of the class and confidence.

**To build a model for training process:**

The training of the cascade proved to be no easy task. The first necessary bit was to gather the images, then create samples based on them and finally starting the training process. The opencv traincascade utility is an improvement over its predecessor in several aspects, one of them being that traincascade allows the training process to be multithreaded, which reduces the time it takes to finish the training of the classifier. This multithreaded approach is only applied during the precalculation step however, so the overall time to train is still quite significant, resulting in hours, days and weeks of training time. Since the training process needs a lot of positive and negative input images, which may not always be present, then a way to circumvent this is to use a tool for the creation of such positive images. OpenCV built in mode allows creating more positive images with distorting the original positive image and applying a background image. However, it does not allow to do this for multiple images. By using the Perl script createsamples to apply distortions in batch and the mergevec tool, it is possible to create such necessary files for each positive input file and then merging the outputted files together into one input file that OpenCV can understand. Another important aspect to consider is the number of positives and negatives. When executing the command to start training, it is required to enter the number of positive and negative images.

**Implementation of person faces re-identification by haar cascade classifier:**

**Haar cascade:**

Haar feature-based cascade classifiers is an effective object detection and it is a machine learning based approach where a cascade function is trained from a lot of positive and negative images. It will work with face detection, the algorithm needs a lot of positive images (images of faces) and negative images (images without faces) to train the classifier. Then we need to extract features from it. Each feature is a single value obtained by subtracting sum of pixels under white rectangle from sum of pixels under black rectangle. The cascade classifier consists of a list of stages, where each stage consists of a list of weak learners. The system detects face in question by moving a window over the image. Each stage of the classifier labels the specific region defined by the current location of the window as either positive or negative –

positive meaning that an face was found or negative means that the specified object was not found in the image.

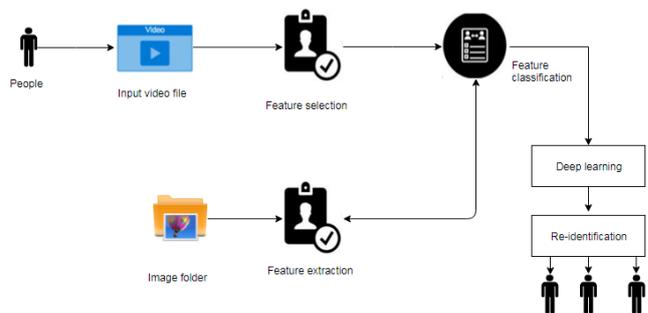
**ALGORITHM**

**Haar cascade**

- Haar feature-based cascade classifiers is an effective object detection and it is a machine learning based approach where a cascade function is trained from a lot of positive and negative images.
- It will work with face detection, the algorithm needs a lot of positive images (images of faces) and negative images (images without faces) to train the classifier.

**SYSTEM DESIGNS**

**SYSTEM ARCHITECTURE**



Architecture Diagram

**SYSTEM TESTING AND MAINTANANCE**

**Testing**

System Analysis and Design process including Requirement Analysis, Business Solution Options, Feasibility Study, Architectural Design was discussed in previous chapter.

Generally Software bugs will almost always exist in any software module. But it is not because of the carelessness or irresponsibility of programmer but because of the complexity. Humans have only limited ability to manage complexity. This chapter discusses about the testing of the solution and implementation methodologies.

**Unit Testing**

Software Testing is the process of executing a program or system with the intent of finding errors. The scope of



software testing often includes examination of code as well as execution of that code in various environments and conditions. Testing stages of the project can be explained as below and system was tested for all these stages.

**• Component or unit testing**

- Individual components are tested independently;
- Components may be functions or objects or coherent groupings of these entities.

**• System testing**

- Testing of the system as a whole. Testing of emergent properties is particularly important.

**Acceptance testing**

- Testing with customer data to check that the system meets the customer's needs.

**Testing Methods and Comparison**

**8.4 Black Box Testing**

Black Box Testing is testing without the knowledge of the internal workings of the item being tested. When black box testing is applied to software engineering, the tester selects valid and invalid input and what the expected outputs should be, but not how the program actually arrives at those outputs. Black box testing methods include equivalence partitioning, boundary value analysis, all-pairs testing, fuzz testing, model-based testing, traceability matrix, exploratory testing and specification-based testing. This method of test design is applicable to all levels of software testing: unit, integration, functional testing, system and acceptance.

**White Box Testing**

White box testing (glass box testing) strategy deals with the internal data structures and algorithms. The tests written based on the white box testing strategy incorporate coverage of the code written, branches, paths, statements and internal logic of the code etc. These testers require programming skills to identify all paths through the software.

Types of white box testing includes code coverage (creating tests to satisfy some criteria of code

coverage.), mutation testing methods, fault injection methods, static testing.

**CONCLUSION AND**

**FUTURE ENHANCEMENT**

**Conclusion**

- In haar cascade algorithm is implemented to classify human and we addressed the task of facial expression recognition by identified face image through input video file.
- It classified the image of faces into any of two discrete face features categories that represent end-to-end trainable deep learning algorithm to produce global video-level features over the entire video for video-based person re-ID.

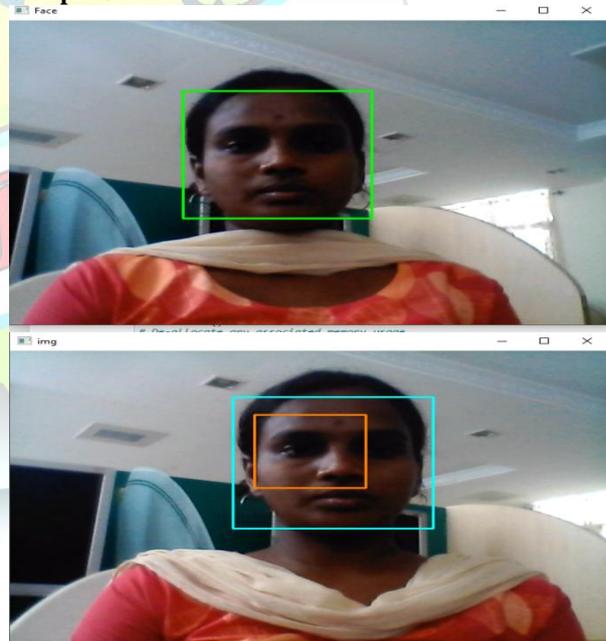
**Future Enhancement**

- This will allow us to investigate the efficiency of pre-trained models for facial emotion recognition.

To automate this process by show the detection result in web application or desktop application and to optimize the work to implement in Artificial Intelligence environment

**APPENDICES**

**Sample Screens**



Person face Recognition from given input image



