**Project Title :** An improved face recognition algorithm and its application in attendance management system

**Author Name :** Serign Modou Bah, Fang Ming

**Year of Publish : 2020**

**Abstract :** Face Recognition is a computer application that is capable of detecting, tracking, identifying or verifying human faces from an image or video captured using a digital camera. Although lot of progress has been made in domain of face detection and recognition for security, identification and attendance purpose, but still there are issues hindering the progress to reach or surpass human level accuracy. These issues are variations in human facial appearance such as; varying lighting condition, noise in face images, scale, pose etc. This research paper presents a new method using Local Binary Pattern (LBP) algorithm combined with advanced image processing techniques such as Contrast Adjustment, Bilateral Filter, Histogram Equalization and Image Blending to address some of the issues hampering face recognition accuracy so as to improve the LBP codes, thus improve the accuracy of the overall face recognition system. Our experiment results show that our method is very accurate, reliable and robust for face recognition system that can be practically implemented in real-life environment as an automatic attendance management system.

**Project Title : Ensemble of texture descriptors for face recognition obtained by varying feature transforms and preprocessing approaches**

**Author Name :** Loris Nanni1 Alessandra Lumini2 Sheryl Brahnam3

**Year of Publish : 2017**

**Abstract :** This paper presents a novel ensemble of descriptors for face recognition derived from the base Patterns of the Oriented Edge Magnitudes (POEM) descriptor. Starting from different texture descriptors recently proposed in the literature, namely, the base patterns of POEM and the Monogenic Binary Coding (MBC), we develop different ensembles by varying the preprocessing techniques, the subspace projections, and some parameters of the system. Our approach is tested on the FERET datasets and the Labeled Faces in the Wild (LFW) dataset. Our system performs well on both datasets, obtaining, to the best of our knowledge, one of the highest performance rates published in the literature on the FERET datasets with an average accuracy of 97.3%. We want to stress that our ensemble obtains outstanding results in both datasets without any supervised approach or transform. The main findings of our proposed system include the following: 1) significant improvement in performance can be obtained by simply varying the parameters of stand-alone descriptors; and 2) performance can be improved by combining different enhancement and feature transform techniques.

**Project Title :** **Face Recognition Algorithms: A Review**

**Author Name :** **Sneh Prabha1, Rahul Bulchandani1\*, Rajiv Mishra2, Sarthak Agarwal3, Shreya Chauhan**

**Year of Publish : 2021**

**Abstract** **:**Due to its applicability in different domains of life face recognition is a very fast growing area of research. In daily life, to receive information and interpret it and to identify familiar faces, face recognition is used. It is prevalent due to its simplicity and performance. In the last few years tremendous research has been carried out but still there are many challenges related to face recognition. In covid time it becomes challenging to identify a mask wearing face. This paper aims to provide an overview of some of the well known facial recognition algorithms and techniques used in research. Initially face recognition was implemented using Principal Component Analysis, Linear Discriminant Analysis, Support Vector Machine, Adaboost but nowadays to improve the quality deep learning is used.

**Project Title :** Face Recognition Method for Online Exams

**Author Name :** Arief Agus Sukmandhani, Indrajani Sutedja

**Year of Publish : 2020**

**Abstract :** In the development of this technology, biometric systems are highly developed for use in various applications. Biometric systems are usually used to identify and analyze the characteristics of the human body such as fingerprints, retina, sound patterns, facial patterns and other body structures that can be used for system authentication. As well as facial recognition technology more and more used and developed for various applications including security systems, attendance systems or other things. As well as attendance system that is a recurring transaction because it is associated with controlling the presence of a person in activity. in the field of education, the attendance system is very important because the presence of students is part

of a good assessment for teaching and learning. This research is to develop a prototype of face-based online exam application using the Eigenface method to detect student attendance

**Project Title :** FaceForensics: A Large-scale Video Dataset for Forgery Detection in Human Faces

**Author Name :** Andreas R¨ossler Davide Cozzolino Luisa Verdoliva Christian Riess Justus Thies Matthias Nießner

**Year of Publish : 2020**

**Abstract :** With recent advances in computer vision and graphics, it is now possible to generate videos with extremely realistic synthetic faces, even in real time. Countless applications are possible, some of which raise a legitimate alarm, calling for reliable detectors of fake videos. In fact, distinguishing between original and manipulated video can be a challenge for humans and computers alike, especially when the videos are compressed or have low resolution, as it often happens on social networks. Research on the detection of face manipulations has been seriously hampered by the lack of adequate datasets. To this end, we introduce a novel face manipulation dataset of about half a million edited images (from over 1000 videos). The manipulations have been generated with a state-of-the-art face editing approach. It exceeds all existing video manipulation datasets by at least an order of magnitude. Using our new dataset, we introduce benchmarks for classical image forensic tasks, including classification and segmentation, considering videos compressed at various quality levels. In addition, we introduce a benchmark evaluation for creating indistinguishable forgeries with known ground truth; for instance with generative refinement models.

**Project Title :** Face detection based on Deep Convolutional Neural Networks exploiting incremental facial part learning

**Author Name :** Danai Triantafyllidou, Anastasios Tefas

**Year of Publish : 2020**

**Abstract :** Deep learning methods are powerful approaches but often require expensive computations and lead to models of high complexity which need to be trained with large amounts of data. In this paper, we consider the problem of face detection and we propose a light-weight deep convolutional neural network that achieves a state-of-the-art recall rate at the challenging FDDB dataset. Our model is designed with a view to minimize both training and run time and outperforms the Convolutional network used in [1] for the same task. Our model consists only of 113.864 free parameters whereas the previously proposed CNN for face detection had 60 million parameters. We propose a new training method that gradually increases the difficulty of both negative and positive examples and has proved to drastically improve training speed and accuracy. Our second approach, involves training a separate deep network to detect individual facial features whilst creating a model that combines the outputs of two different networks. Both methods are able to detect faces under severe occlusion and unconstrained pose variation and meet the difficulties and the large variations of real-world face detection.

**Project Title : Improved Face Recognition Rate Using HOG Features and SVM Classifier**

**Author Name :** Harihara Santosh Dadi, Gopala Krishna Mohan Pillutla

**Year of Publish : 2019**

**Abstract :**A novel face recognition algorithm is presented in this paper. Histogram of Oriented Gradient features are extracted both for the test image and also for the training images and given to the Support Vector

Machine classifier. The detailed steps of HOG feature extraction and the classification using SVM is presented.

The algorithm is compared with the Eigen feature based face recognition algorithm. The proposed algorithm

and PCA are verified using 8 different datasets. Results show that in all the face datasets the proposed

algorithm shows higher face recognition rate when compared with the traditional Eigen feature based face

recognition algorithm. There is an improvement of 8.75% face recognition rate when compared with PCA based

face recognition algorithm. The experiment is conducted on ORL database with 2 face images for testing and 8

face images for training for each person. Three performance curves namely CMC, EPC and ROC are

considered. The curves show that the proposed algorithm outperforms when compared with PCA algorithm.

**Project Title :** Multi-Scale Fully Convolutional Network for Face Detection in the Wild

**Author Name :** Yancheng Bai \_1,2 and Bernard Ghanem

**Year of Publish : 2017**

**Abstract :** *Face detection is a classical problem in computer vision.*

*It is still a difficult task due to many nuisances that naturally*

*occur in the wild, including extreme pose, exaggerated*

*expressions, significant illumination variations and severe*

*occlusion. In this paper, we propose a multi-scale fully convolutional*

*network (MS-FCN) for face detection. To reduce*

*computation, the intermediate convolutional feature maps*

*(conv) are shared by every scale model. We up-sample*

*and down-sample the final conv map to approximate* K *levels*

*of a feature pyramid, leading to a wide range of face*

*scales that can be detected. At each feature pyramid level,*

*a FCN is trained end-to-end to deal with faces in a small*

*range of scale change. Because of the up-sampling, our*

*method can detect very small faces (*10×10 *pixels). We test*

*our MS-FCN detector on four public face detection benchmarks,*

*including FDDB, WIDER FACE, AFW and PASCAL*

*FACE. Extensive experiments show that our detector outperforms*

*state-of-the-art methods on all these datasets in*

*general and by a substantial margin on the most challenging*

*among them (*e.g*. WIDER FACE Hard). Also, MS-FCN*

*runs at* 23 *FPS on a GPU for images of size* 640×480 *with*

*no assumption on the minimum detectable face size*

**Project Title :** TechniquesandChallengesof Face Recognition: A Critical Review

**Author Name :** Shilpi Singha,S.V.A.V.Prasadb*a*

**Year of Publish : 2018**

**Abstract :** of computer vision. Face recognition is one of the important issues in object recognition and computer vision. In our day to day activities,a number of biometric applications areavailable for recognizing humans such aseye or iris recognition, fingerprint recognition, face recognition. Face is an important part of human being and requires detection for differentapplications such as security, forensic investigation. It requires proper techniques for face detection and recognition with challenges of different facial expressions, pose variations, occlusion, aging andresolutioneither in the frame of stationary object or video sequencing images.Authors tried to put the concept of face synthesis, for improving accuracy and recognition rateon different face database like ORL, YALE, AR and LFW.Authors hadpresented a critical review of various types of face recognition techniquesand challenges, to improve efficiency and recognition rate for identifyingface images in large database, with comparison of accuracy orrecognition rate.

**Project Title :** Towards a Deep Learning Framework for Unconstrained Face Detection

**Author Name :** Yutong Zheng∗ Chenchen Zhu∗ Khoa Luu Chandrasekhar Bhagavatula, T. Hoang Ngan Le Marios Savvides

**Year of Publish : 2020**

**Abstract :** Robust face detection is one of the most important preprocessing steps to support facial expression analysis, facial landmarking, face recognition, pose estimation, building of 3D facial models, etc. Although this topic has been intensely studied for decades, it is still challenging due to

numerous variants of face images in real-world scenarios. In this paper, we present a novel approach named Multiple Scale Faster Region-based Convolutional Neural Network (MS-FRCNN) to robustly detect human facial regions from images collected under various challenging conditions, e.g.

large occlusions, extremely low resolutions, facial expressions, strong illumination variations, etc. The proposed approach is benchmarked on two challenging face detection databases, i.e. the Wider Face database and the Face

Detection Dataset and Benchmark (FDDB), and compared against recent other face detection methods, e.g. Twostage CNN, Multi-scale Cascade CNN, Faceness, Aggregate Chanel Features, HeadHunter, Multi-view Face Detection,

Cascade CNN, etc. The experimental results show that our proposed approach consistently achieves highly competitive results with the state-of-the-art performance against other recent face detection methods.