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| **Project Id:** 22301  **Project Title**: Face recognition in unconstrained environment using Deep Learning. | |
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| **Short description of the project:**  Developing a highly efficient face recognition framework to learn a robust face detection and verification in an unconstrained environment using aggressive data augmentation and convolutional neural networks. The objective is to learn a deep face representation from large-scale data with massive noisy and occluded face. This need to add an adaptive fusion of softmax loss and center loss as supervision signals, which are helpful to improve the performance and to conduct the final classification. | |
| **Aim/Objective of the project:**  To study and design a face detection and recognition framework that can detect and recognize faces in real time in an unconstrained environment. | |
| **Methodology (the necessary software/tool or process):**  This project is to be done using OpenCV library and Python programming language.   * STEP 1:- Face Detection - Detect/identify faces in an image (using a face detection model) – for simplicity, this tutorial will only use images with one face/person in it, not more/less. * STEP 2:- Face Alignment - Goal is to scale and crop face images in the same way using a set of reference points located at fixed locations in the image. * STEP 3:- Face Representation - the pixel values are transformed into a compact and discriminative feature vector, also known as a template. All the faces of a same subject should map to the similar feature vectors. * STEP 4:- Face Matching - A score is produced by comparing the two templates, this indicates the likelihood of the subjects. | |
| **Possible outcome of the project:**  This project shows the detailed report about the face recognition and identifies the subjects. This project gives an output with detailed information about the subject if the face is recognized. However, for optimum performance we can use images of the people where the face is clearly visible and can train the CNN with more detailed images captured from different regions and scales to form a powerful face representation. | |
| **Importance of the project in engineering aspect:**   * This project’s main importance lies in the safety and security. Face recognition decreases the chances of fraudulent activities and deterioration in crimes. This algorithm training increases the chances of dividing the face into segments and increases the chances of recognizing the face by searching those area. * This project’s new implementation extends into the domain of billing. By recognizing the face this billing is done and is now being implemented by Amazon. And previously this feature includes the range of tagging and grouping photos in Facebook and cloud storage by Google and Apple respectively. | |
| **Innovativeness if any (why the project is different from others):**   * This project detects the presence of a face in an image or video, face recognition algorithms must also be able to tell a live face versus a non-live digital image of a face. * Wide variety of environmental capture conditions make accurate matching more challenging. This project enables to recognize face even in challenging climate conditions. * This project can handle more than one faces in the acquired image. This can classify the acquired image correctly and can also detect the face and give the desired output. | |
| **Reference :**   * https://www.aware.com/facial-recognition/ * https://roboticsbiz.com/250-research-papers-and-projects-in-face-recognition-free-download/ * https://www.researchgate.net/publication/262875649\_Design\_of\_a\_Face\_Recognition\_System * https://link.springer.com/chapter/10.1007/978-981-16-1048-6\_18 * Singh S, Prasad SVAV (2018) Techniques and challenges of face recognition: a critical review. Procedia Comput Sci 143:536–543. * Mostafa Mehdipour Ghazi, Hazim Kemal Ekenel; Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR) Workshops, 2016, pp. 34-41. | |