IIIT Delhi
Divyanshu Kumar Singh (2017048)
Harshit Rai (2017152)
Sankalp Agrawal (2017363)

A Comparative Analysis: Labeled Faces in the Wild Database

September 08, 2019

Motivation

The quality of camera lenses has evolved over the past decade, starting from VGA to WideAngle, High-Resolution Cameras, etc and this has not only resulted in competition between different camera lens manufactures but also, the way images are now being processed has gained a lot of attention. In computer a huge amount of research is being done to analyze images, be it in the field of Computer Vision, Pattern Recognition, Image Analysis or Biometric. One such problem that is being researched is Facial Recognition, and the results are also available for the same. But the question remains 'Why' and 'Which' algorithm is best for a particular dataset, being said that there is no universally accepted algorithm for Facial Recognition. In this particular study, we will try to answer these two 'W's' for the 'Labeled Faces in the Wild ' datasets by comparing the various algorithms and we will try to implement an algorithm to compare our results.

Data Acquisition

We will be using the dataset provided by the University of Massachusetts for facial recognition research. (http://vis-www.cs.umass.edu/lfw/)

Learning Techniques Used

- Data analysis and Machine Learning/ Deep Learning Model Analysis will be done in order to compare the results from the various algorithms used for the dataset based on their performance,(for instance, facial landmark localization, face pose estimation.)
- Comparison of various SVM kernels (like Linear, Polynomial, and RBF) on the basis of efficiency.

- Implementation of a classification algorithm on the basis of a comparison of the above models for the LFW database.

Individual Deliverables

1. Harshit Rai

   a. Studying different algorithms.

   b. Analyzing the scope of the Deep Learning Model for the new algorithm.

2. Sankalp Agrawal

   a. Implementation of the classification algorithm using logistic regression.

   b. Comparison of SVM Kernel-based models.

3. Divyanshu Kumar Singh

   a. Implementing algorithms for Machine Learning approach.

   b. Analyzing the scope of the Deep Learning Model for the new algorithm.

Evaluation metrics

We will evaluate our models on the basis of the Receiver Operating Characteristic (ROC) curve, accuracy, efficiency, sensitivity, error rate, and AUC score.

References:

- http://csjournals.com/IJCSC/PDF7-2/22.%20Anitha.pdf
- Stephen Balaban "Deep learning and face recognition: the state of the art", Proc. SPIE 9457, Biometric and Surveillance Technology for Human and Activity Identification XII, 94570B (15 May 2015); https://doi.org/10.1117/12.2181526
- https://hal.inria.fr/inria-00321923/