Faculty Face Recognition using Deep Learning for Smart Attendance Monitoring

John Carlo F. Camba (1), Jaymer M. Jayoma (2)

[1] Caraga State Univ., College of Computing and Inf. Sci., 341-2786, Department of Inf. Sys., Phl.
[2] Caraga State Univ., College of Computing and Inf. Sci, 341-2786, Department of Comp. Sci., Phl.
Email: jfcamba@carsu.edu.ph, jmjayoma@carsu.edu.ph

Abstract: The Face Detection and Recognition is an application focusing on identifying or verifying an important feature of a person from a real-time captured image. It is by matching some facial feature from the captured image and a database consisting of faces as trained sets. Through the advancement of technology, the need for improvement to keep the record of faculty attendance, and to assist making objectively personnel decision, Faculty Face Recognition Using Deep Learning for Smart Attendance Monitoring is viable solution to address altering of attendance. The study used pre-trained model called facenet which is pre-trained using the labeled faces in the wild (LFW) data sets but acquires new training data sets to generate recognition system for the College of Computing and Information Sciences (CCIS). The acquired data are cleaned through eliminating duplicates, resized and cropped into the desired dimension 250 by 250 pixel per inch, and labeling each image data. This new set of data is used to produce a new desired classifier. The system used image pre-processing techniques like face alignment algorithm, landmarks, face detection, and LBP. The feature extracted from the images is map to a numerical vector representation called 128-d embedding in Tensorflow and using Triplet Loss function to calculate the distance relativity of the positive images to the anchor image and distance irrelatively of negative images to anchor image. The trained classifier is tested using the test validation function and in the actual laboratory setting environment. The actual testing used three factors like distance, angles and lighting to validate its efficiency. The produced classifier able to detect and recognize faculty faces in a computer laboratory environment with recognition accuracy rate of 96.45%. Each data of a recognized faculty is recorded every time as per scheduled and saved in a .CSV file that serve as its database.

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