

ABSTRACT

This final project analyzes a facial recognition system that uses Raspberry Pi 3 B+ as the center of the system. The system in this Final Project uses Raspberry Pi 3 B+ and Raspberry Pi Camera Module V2.1. The face recognition system used is a face recognition system from Pyimagesearch which is intended for Raspberry Pi 3. There is an encode_face.py program to image training processes from five research subjects. There is also the pi_face_recognition.py program which will be run and tested on four people whose faces have been in a database that has been previously trained and on someone whose face is not in the face recognition system database. The method used for face recognition is Deep Metric Learning with step training triplets. Whereas face detection utilizes a default frontal face haar cascade in the form of an xml file. The face recognition system in this Final Project is based on pi_face_recognition derived from pyimagesearch by Adrian. Face recognition uses a network architecture called David King's Dlib and Adam Geutgey's face recognition module. The dataset consists of 5 people with the number of faces per person that is 30 photos, so the total is 150 photos. Then the dataset is trained using encode_face.py to produce the TUGASAKHIR-5subjek.pickle file. Face recognition system testing is carried out on four different test conditions, namely 1.5 meters, 2 meters, 2.5 meters and 3 meters. There are three types of testing parameters, namely size parameters, scale factor parameters, and neighborhood parameters. Variations in the value of the size parameter are 20x20, 25x25, 30x30, and 35x35. Variations in the values of the scale factor parameters are 1.1; 1.2; 1.3; and 1.4. Variation values of the neighboring parameters are 3, 4, 5, and 6. The test results show the highest Accuracy value is 80% and the True Positive Rate reaches 100% with the best parameters, namely the size parameter 20 × 20, scale factor parameters 1,1, and parameters neighborhood is worth 3.

Keyword : Raspberry Pi 3 B+, face recognition, Deep Metric Learning