Abstract

Network-optimized virtual assistant (NOVA) is a robot developed by Bandung Techno Park (BTP) that can interact with humans for various purposes, such as a receptionist robot. NOVA robot is still in development and one of the main focuses is adding face recognition features so that the robot can actively greet and interact with humans. Therefore, we propose a face recognition and tracking system based on neural networks. This system is developed using the Google FaceNet feature extraction method. Previously, face detection in NOVA robot was implemented by employing the multi-task cascaded convolutional networks (MTCNN) method, whereas face tracking on the system was realized by using the modification of the MOSSE object tracking method. However, we found that the implementation of MTCNN in NOVA robot cannot run better than 30 fps. Therefore, this paper aims to solve this issue by investigating conventional face detection methods that could outperform MTCNN in this regard. Tests conducted on the ChokePoint dataset demonstrates that the system with LBP can achieve 30.44 fps framerate with a precision of 95% and recall of 83%. The test results prove that LBP is not only better than MTCNN in identifying faces but also more efficient to compute.

Keywords: LBP, MTCNN, HAAR, NOVA, MOSSE