

ABSTRACT

This research addresses the issue of manual employee attendance systems, which are prone to manipulation and individual fraud, as well as the need for an accurate and reliable automated facial recognition-based attendance system, specifically for restricting ingress and egress to the DRC Server Room at PT. Pelindo Marine Service. As a solution, this study aims to design and compare the performance of three Convolutional Neural Network (CNN) architectures—InceptionV3, ResNet50, and VGG16—in implementing a facial recognition-based employee attendance system. The facial dataset used underwent automatic cropping using the MTCNN method or model, across three different training dataset scenarios based on the number of epochs: 50, 80, and 100. Evaluation was conducted on training accuracy, validation accuracy, and the training time efficiency of each architecture. The research results indicate that the VGG16 architecture achieved the best performance with the highest validation accuracy of 99.31% at the 100th epoch, although it required a longer training time. However, during the testing or demo phase, the VGG16 architecture proved to be a less suitable option for implementation with the dataset I used. This was followed by the ResNet50 architecture, which performed slightly better in terms of classification during testing. The best overall result was obtained by the InceptionV3 architecture, achieving an accuracy of 79% from its classification report. From these evaluation results, it can be concluded that InceptionV3 is the most recommended architecture for attendance systems requiring high accuracy, serving as a reference point for identifying the optimal facial recognition system for employee attendance. The developed system holds potential for application in work environments such as PT Pelindo Marine Service.

Keywords: *Face Recognition, Deep learning, InceptionV3, Resnet50, VGG16*