

ABSTRACT

Facial expression is a form of nonverbal communication that consists of one or more movements or muscle positions on the face and can reveal the individual's emotional state to someone who is observing it. Facial expression recognition is widely applied in the field of services and surveillance cameras. Through CCTV surveillance cameras, it can be seen whether customers feel happy when shopping or vice versa. Generally, computers cannot detect various human facial expressions properly. Therefore, in this study a system was created to facilitate the identification of human facial expressions on a computer.

In this final project, a system is designed to classify facial expressions using the Convolutional Neural Network (CNN) method with Residual Network 50 (Resnet-50) architecture. This final project uses the JAFFE dataset which consists of 213 face images. The expression classification stage is divided into seven classes, namely angry, sad, happy, surprised, disgusted, shocked and neutral.

The facial expression input image is processed through several design stages including preprocessing and classification using Resnet-50. The preprocessing stage is cropping on the face of the input image and resizing the input image to 64×64 pixels. The next stage is the Resnet-50 classification using three optimizers, namely Adaptive Moment (Adam), Stochastic Gradient Descent (SGD) and Root Mean Square Propagation (RMSProp). The test scenario in this final project is to compare the system performance from the optimizer test, the effect of the epoch size, the effect of the learning rate value, the effect of the batch size value and the comparison of system performance. The final result shows the best model for classifying facial expressions using the Adam optimizer with epoch 70, on a batch size of 8 and a learning rate of 0.0005 resulting in an accuracy value of 97.67%.

Keywords: *Facial Expression, Convolutional Neural Network (CNN), Resnet-50, JAFFE.*