ABSTRACT

The Covid-19 pandemic has made the use of face masks common in society as an effort to prevent the spread of the virus. However, this has posed new challenges in Facial Expression Recognition (FER).

Facial Expression Recognition is employed to understand human behavior, thereby aiding strategies for virus spread prevention and overcoming social barriers despite limitations. In terms of security, it can be utilized to distinguish individuals with malicious intent behind mask-covered expressions. The current limitation of Facial Expression Recognition is the restricted detection of various emotions due to the loss of crucial information from the mouth and nose areas covered by masks.

This study aims to identify a Convolutional Neural Network (CNN) architecture model with accuracy in recognizing several emotions such as happiness, anger, sadness, neutrality, and surprise. The research evaluates the performance of three models: ResNet50, Emotion Ensemble Model, and VGG19. ResNet50 demonstrated a performance accuracy of 89.51%, the Emotion Ensemble Model achieved an accuracy of 82.49%, and VGG19 reached an accuracy of 72.44%.

The primary contribution of this research is the development of a sufficiently accurate ensemble on a highly varied dataset, as well as an analysis of the strengths and weaknesses of each model. This assists in selecting the appropriate model architecture f or image-based emotion recognition under constrained conditions.

Keywords: facial expression recognition, convolutional neural network, ResNet50, masker wajah, deep learning, Masked-Fer2013