ABSTRACT

Real-time facial expression recognition in mobile applications is becoming increasingly important in the era of rapidly developing technology. However, the implementation of this technology faces challenges related to resource limitations on mobile devices, which often lead to low accuracy and the system's inability to recognize facial expressions accurately.

This study proposes the development of a mobile application using the MobileNet and ShuffleNet models to detect facial expressions in real time. The solution implemented involves the use of a lightweight architecture suitable for mobile devices, as well as the implementation of a multilabel approach to improve detection accuracy on expressions that are difficult to recognize. The system built utilizes TensorFlow and OpenCV for image processing and model implementation.

The test results show that before multilabel testing, MobileNet achieved an accuracy of 59% and ShuffleNet 54%. After multilabel implementation, the accuracy of MobileNet increased to 87.14%, and ShuffleNet to 70.86%. This study contributes to overcoming the problem of accuracy in facial expression detection in mobile applications, especially with the multilabel solution which is proven effective in improving model performance on imbalanced data.