

ABSTRACT

Stress is one of the mental health problems that many individuals experience in the modern era. Factors such as work pressure, social demands, and economic uncertainty are often the main triggers. If not handled properly, stress can have a negative impact on a person's quality of life, including physical health, mental health, and productivity. Therefore, stress level detection is important to help individuals manage the condition early. This study aims to develop a stress level detection system based on facial image processing with YOLOv8 for object detection and linear regression.

This system utilizes a trained YOLOv8 model to detect facial expressions that indicate stress levels, as well as linear regression to predict stress scores based on features extracted from facial images. The dataset used in this study is a primary dataset consisting of facial photos with neutral expressions, which are equipped with stress scores obtained through the Depression Anxiety Stress Scales 21 (DASS-21) assessment. This system is evaluated using metrics such as mAP, precision, recall, and F1-score to measure stress level detection performance.

The results of this study indicate that the designed system can be used to detect and predict stress levels based on facial expressions. In this study, it gave the best results with mAP@50 of 91%, precision of 76%, recall of 84% and F-1 Score of 79% to detect and classify stress levels. These results were obtained when using the AdamW optimizer, with a batch size of 16 and a learning rate of 0.001 with epoch 100.

Keywords : Stress Detection, Face *Image* Processing, YOLOV8, Linear Regression, DASS-21.