

## ABSTRACT

Nowaday, the development of computer vision technology can be utilized to create devices to monitor the learning systems related to the estimated level of student attention in class. The level of attention defined based on students' facial expressions that can be analyzed by image processing.

In this final project, student expression classification system in the class was made by using Multiscale Local Binary Pattern (MLBP) method and Support Vector Machine (SVM) classifier. The training and test images used in the system are obtained through the image acquisition process. The 4 phases of pre-processing stage are face detection, face part detection (eyes and mouth), cropping, and grayscaling. Furthermore, feature extraction is carried out using MLBP with the aim of finding the value of features in the results of the previous stage. The method was chosen because the MLBP method can represent more features of an image compared to a single Local Binary Pattern (LBP) that works on a limited basis. After that, the classification is done with SVM to determine and estimate the class of facial images.

This final project is designed to classified students expression in class so that can be used by the instructor to evaluate their teaching techniques. The seven basic expressions are angry, disgust, fear, happiness, neutral, sadness, and surprise. For the person dependent scheme, the train and test images are the same, consists of 224 training images distributed into the 7 basic expressions. In the person independent, there are 224 images for training and 5 test images where there are 10 individuals in each test images with distributed expression. The best accuracy of system from the test results are 100% in person dependent scheme and 88% in person independent scheme by using the combination of P=8, R=1 and P=16 and R=8 for the MLBP operators configuration and One Against One (OAO) classification of multiclass SVM.

**Keywords:** attention estimation, facial expression recognition, learning analytics