

## ABSTRACT

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*This project is developing a face expression recognition using deep learning with Convolutional Neural Network (CNN) to recognize five facial expressions: happy, sad, angry, neutral, and surprise. This final project is motivated by the rapid advancements in technology, especially in image processing, and it results in a model that can be employed as a lie detection tool and tool for mental healthcare. The training process in this final project utilizes three levels of convolutional layers and achieves the highest accuracy in the second model, with 90.58% on the training dataset and 92.84% on the validation dataset. Besides the second model, overfitting was observed in the the rest of the models, which prompted testing by adding extra normalization layers such as 'BatchNormalization.'. The process of facial expression detection is assisted by an additional algorithm, namely the Viola-Jones algorithm, using a webcam for real-time testing. This final project does not utilize a confidential index to measure the model's confidence level during testing. Therefore, for further development, the addition of a confidential index can be considered.*

*Keywords : Deep Learning, Convolutional Neural Network, Facial Expression Detection, Overfitting*