FACIAL EXPRESSION RECOGNITION USING CONVOLUTIONAL NEURAL NETWORK

A Project report submitted in partial fulfilment of the requirements for the award of

degree of

BACHELOR OF TECHNOLOGY IN

ELECTRONICS AND COMMUNICATION ENGINEERING

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VISAKHAPATNAM DISTRICT-531113

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<u>CERTIFICATE</u>

This is to certify that the project entitled "**FACIAL EXPRESSION RECOGNITION USING CONVOLUTIONAL NEURAL NETWORK**" in partial fulfilment for the of degree of Bachelor of Technology in ELECTRONICS AND COMMUNICATION ENGINEERING at AVANTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY, MAKAVARAPALEM, VISAKHAPATNAM is an bona fide work carried out by M NIHARIKA(18811A0417), G AJAY (19815A0408), G POOJITHA (18811A0412), G.SAI KUMAR(19815A0407) under the guidance and supervision during 2018-2022.

PROJECT GUIDE

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ABSTARCT

Human emotions are the mental state of feelings and are spontaneous. There is no clear connection between emotions and facial expressions and there is significant variability making facial recognition a challenging research area. Features like Histogram of Oriented Gradient (HOG) and Scale Invariant Feature Transform (SIFT) have been considered for pattern recognition. These features are extracted fromimages according to manual predefined algorithms. In recent years, Machine Learning(ML) and Neural Networks (NNs) have been used for emotion recognition. In this report, a Convolutional Neural Network (CNN) is used to extractfeatures from imagesto detect emotions. The Python Dlib toolkit is used to identify and extract 64 important landmarks on a face. A CNN model is trained with grayscale images from the FER 2013 dataset to classify expressions into five emotions, namely happy, sad, neutral, fear and angry. To improve the accuracy and avoid overfitting of the model, batch normalization and dropout are used. The best model parameters are determined considering the training results. The test results obtained show that CNN Model 1 is 80% accurate for four emotions (happy, sad, angry, fear) and 72% accurate for five emotions (happy, sad, angry, neutral, fear), while CNN Model 2 is 79% accurate for four emotions and 72% accurate for five emotions