# Facial Emotion Detection using Convolution Neural Network

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**Abstract:** *Human emotion detection through images is one of the most daunting challenge in the field of artificial intelligence. Machine Learning and Deep Learning are the two major technologies which are used for detecting the facial emotions. Deep Learning based neural networks provides better performance and accuracy. Face detection is a major step in our system that allows us to identify people or objects that are facing the camera. We then use feature extraction to separate individual images into different parts of multidimensional spaces. Finally, we use emotion classification to detect what emotions you're experiencing. Deep-learning approaches are taking part in a vital role in classification tasks. This paper deals with facial emotion recognition by applying transfer learning approaches. During this work pre-trained networks of VGG16 and MobileNet are used. The fully connected layers of the pre-trained ConvNets are eliminated, and that we add our fully connected layers that are appropriate for the number of directions in our task. Finally, the recent added layers are solely trainable to update the weights. This paper proposes a Convolutional Neural Network (CNN) based on Deep Learning architecture which will extract the features and at the same time classify the emotions into seven categories. The model will use three datasets: Japanese Female Facial Expressions (JAFFE), Extended Cohn-Kanade Dataset (CK+) and Facial Expression Recognition 2013 (FER2013) to train itself and increase its accuracy.*

**Keywords***:* Artificial Intelligence (AI), Facial Emotion Recognition (FER), Convolutional neural networks (CNN), Japanese Female Facial Expression (JAFFE) Dataset, Cohn Kanade Dataset (CK+), Facial Emotion Recognition Dataset (FER2013), Deep learning (DL).

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