# Facial Expressions Recognition in Thermal Images based on Deep Learning Techniques

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**Abstract**

Facial expressions are undoubtedly the best way to express human attitude which is crucial in social communications. This paper gives attention for exploring the human sentimental state in thermal images through Facial Expression Recognition (FER) by utilizing Convolutional Neural Network (CNN). Most traditional approaches largely depend on feature extraction and classification methods with a big pre-processing level but CNN as a type of deep learning methods, can automatically learn and distinguish influential features from the raw data of images through its own multiple layers. Obtained experimental results over the IRIS database show that the use of CNN architecture has a 96.7% recognition rate which is high compared with Neural Networks (NN), Autoencoder (AE) and other traditional recognition methods as Local Standard Deviation (LSD), Principle Component Analysis (PCA) and K-Nearest Neighbor (KNN)

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