CROSS CULTURAL FACIAL EMOTION RECOGNITION USING TRANSFER LEARNING

ANNOTATED BIBILOGRAPHY

IN PARTIAL FULFILMENT OF THE REQUIREMENTS OF THE DEGREE OF BACHELOR OF THE SCIENCE IN ENGINEERING

Submitted by:

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DEPARTMENT OF COMPUTER ENGINEERING

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1. Facial Emotion Recognition Using Transfer Learning in the Deep CNN

(1) Akhand, M.A. *et al.* (2021) 'Facial emotion recognition using transfer learning in the deep CNN', *Electronics*, 10(9), p. 1036. doi:10.3390/electronics10091036.

(2) This article investigates recognizing facial emotions using transfer learning with deep convolutional neural networks (DCNNs) and it focuses on improving accuracy for different angles and challenging datasets. **(3)** The research aims to make facial emotion recognition more accurate by using transfer learning with pre-trained DCNNs for better emotion classification. The study modifies pre-trained models, fine-tuning dense layers and DCNN blocks, and evaluates performance using KDEF and JAFFE datasets with frontal and profile views. **(4)** The study examines seven basic emotions using two standard datasets with images taken from the front and profile views, showing how these methods can work in real-world situations. **(5)** This research helps explain how transfer learning can improve facial emotion recognition, and it offers ways to handle cultural differences and challenges in recognizing emotions from profile-view expressions. **(6)** The main limitation is the limited variety in the datasets, which might make the model less effective for recognizing emotions across different populations and cultures. **(7)** The study showed that the proposed DCNN method reached 94.34% accuracy, proving it useful for recognizing emotions in real-world tasks like patient care and security monitoring. **(8)** This research supports my study by explaining the value of transfer learning in adapting models for cross-cultural emotion recognition and helping to handle more complex, real-world datasets.

2. ViTFER: Facial Emotion Recognition with Vision Transformers

(1) Chaudhari, A. *et al.* (2022) 'Vitfer: Facial emotion recognition with Vision Transformers', *Applied System Innovation*, 5(4), p. 80. doi:10.3390/asi5040080.

(2) The paper investigates how Vision Transformers can be used for facial emotion recognition, showing how facial expressions can be linked to emotions and it also explains the potential use of this method in healthcare, education, and human-computer interaction. **(3)** The study aims to test how well Vision Transformers can recognize emotions from facial expressions using combined datasets. A fine-tuned Vision Transformer model was tested on a merged dataset using data augmentation and preprocessing techniques. **(4)** This research investigates facial emotion recognition using Vision Transformers, focusing on combined datasets, data augmentation, and comparing its performance with ResNet models for practical emotion applications. **(5)** The paper is useful for using Vision Transformers in recognizing emotions across different cultures and it explains how transfer learning and combining datasets can help accurately identify emotions in different cultures. **(6)** The research has limitations like uneven datasets, especially for emotions like disgust, which makes the system less reliable for real-world use. **(7)** The study finds that Vision Transformers outperform older models like ResNet, achieving a maximum accuracy of 84.3%, but they still require better data, balanced datasets, and further improvements for real-world tasks. **(8)** This research helps my study by providing ways to improve cross-cultural facial emotion recognition using advanced deep learning models and it also suggests methods like transfer learning and data enhancement with diverse datasets.

3. Cross-dataset emotion recognition from facial expressions through convolutional neural networks

(1) Dias, W. *et al.* (2022a) 'Cross-dataset emotion recognition from facial expressions through convolutional neural networks', *Journal of Visual Communication and Image Representation*, 82, p. 103395. doi:10.1016/j.jvcir.2021.103395.

(2) This article examines how well convolutional neural networks (CNNs) work in recognizing emotions from facial expressions, discussing challenges and recent progress in the field. **(3)** The research aims to improve emotion recognition accuracy across datasets by developing reliable CNN models adaptable to new datasets. Cross-dataset protocols, fine-tuning, attention mechanisms, and advanced loss functions are used for emotion prediction. **(4)** The study focuses on seven basic emotions, analyzing cross-dataset recognition using diverse conditions like lighting, occlusion, and poses. **(5)** This research is very helpful for my study as it offers useful information about deep learning methods for emotion recognition and it also provides ways to analyze datasets from different cultural and environmental backgrounds using CNN models. **(6)** The study is limited to images and does not include time-based data or video analysis and it also focuses only on seven basic emotions. **(7)** The research achieves an accuracy of 83.13% under cross-dataset evaluation using novel CNN-based approaches, with fusion methods improving emotion recognition across different datasets. **(8)** This work helps my research by showing effective transfer learning methods, focusing on generalization, and addressing challenges like dataset variety and recognizing deep emotions.

4. Enhancing Facial Expression Recognition with Robust CNN Architectures and Adaptive Preprocessing Techniques

(1) Guo, A. (2025) 'Enhancing facial expression recognition with robust CNN architectures and adaptive preprocessing techniques', *Applied and Computational Engineering*, 100(1). doi:10.54254/2755-2721/2025.20426.

(2) This research investigates enhancing facial expression recognition using custom CNNs and adaptive preprocessing for real-world conditions. **(3)** The aim is to develop a reliable facial expression recognition system by introducing advanced regularization methods and preprocessing techniques. The study uses preprocessing, customized CNN architectures, and dynamic hyperparameter tuning to achieve these goals. **(4)** The scope includes analyzing the FER2013 dataset, addressing class imbalances, and evaluating model performance across different emotional categories to enhance system adaptability in real-world applications. **(5)** This paper is helpful for your research as it shows ways to improve facial emotion recognition using better image processing and machine learning methods. **(6)** The study does not include video or time-based data and it works only with grayscale images and focuses on seven basic emotions in the FER2013 dataset, limiting how well it can be applied to other cases. **(7)** The study achieves improved generalization and classification performance, with an accuracy of 65%. **(8)** This research enhances my study, providing insights into reliable preprocessing, CNN design, and addressing class imbalances for accurate and adaptable facial emotion detection.

5. Deep Facial Emotion Recognition Using Local Features Based on Facial Landmarks for Security System

(1) An, Y. (2023) 'Deep facial emotion recognition using local features based on facial landmarks for security system', *Computers, Materials & Continua*, 76(2), pp. 1817–1832. doi:10.32604/cmc.2023.039460.

(2) This paper investigates how recognizing facial emotions can improve human-machine interactions and it focuses on the need for reliable methods to accurately understand emotions from facial expressions. **(3)** The authors aim to improve emotion recognition accuracy by proposing a novel feature extraction method using the Euclidean distance between facial landmarks, specifically around key facial regions. They use an ensemble network classifier to analyze the extracted features. **(4)** The research evaluates the proposed method against conventional algorithms on public databases, focusing on performance under varying lighting and background conditions. **(5)** This article is useful to my research on cross-cultural facial emotion recognition as it explains innovative techniques for feature extraction that can improve emotion detection across diverse populations. **(6)** A limitation of the study is it depends on specific public databases, which may not fully represent the diversity of facial expressions across different cultures and contexts. **(7)** The authors conclude that their proposed method works much better than traditional approaches, showing improved accuracy of 95.87%, particularly in complex backgrounds. **(8)** This research supports my topic by providing ideas for feature extraction to enhance cross-cultural emotion recognition using transfer learning.

This document contains eight different points as follows:

1. Citation

2. Introduction

3. Aims and Research methods

4. Scope

5. Usefulness (to your research/to a particular topic)

6. Limitations

7. Conclusions

8. Reflections (explain how this work illuminates your topic or how it will fill in with your research).