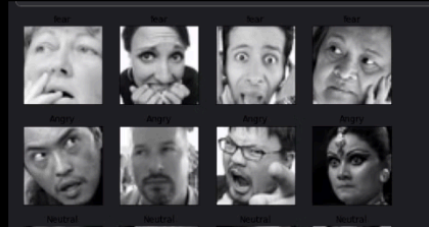


Facial Emotion Recognition using Transfer Learning

Introduction



Facial Emotion Recognition

Facial emotion recognition is the technology that detects and analyzes facial expressions to identify and classify emotions.

Applications

- Human-computer interaction
- Market research and consumer behavior analysis
- Mental health monitoring
- Virtual reality and gaming
- Biometric identification and access control

Dataset

- It consists of 16000+ Images of human faces
- Five classes such as Happy, Fear, Disgust, Neutral, Angry
- Size of image is 48*48

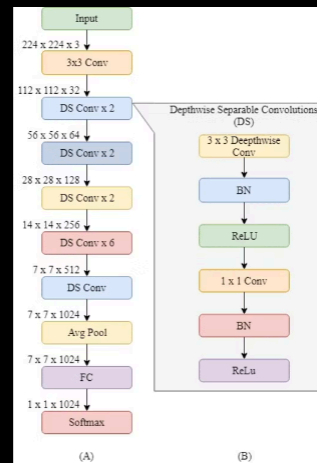


Transfer Learning for Facial Emotion Recognition

- Transfer Learning utilizes pre-trained deep learning models, such as VGG, ResNet, or MobileNet, which are trained on large-scale datasets like ImageNet for generic image recognition tasks.
- Feature Instead of training a model from scratch, Transfer Learning involves leveraging the learned features of the pre-trained models' convolutional layers, which capture hierarchical patterns in images.
- Transfer Learning involves fine-tuning the pre-trained model by retraining some or all of its layers on a smaller dataset specific to the facial emotion recognition task. This fine-tuning process adapts the model to better recognize facial expressions.
- By transferring knowledge from the pre-trained models, Transfer Learning enhances the performance of facial emotion recognition models, even when working with limited labeled data.
- Transfer Learning facilitates domain adaptation by transferring knowledge learned from one domain (e.g., general image recognition) to another domain (e.g., facial emotion recognition), improving the model's ability to generalize and recognize emotions accurately across different facial expressions and variations.

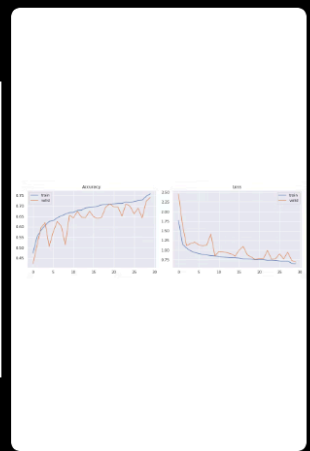
MobileNet

- MobileNet is a lightweight convolutional neural network designed for mobile and embedded devices.
- It uses depthwise separable convolutions to reduce parameters and computations, achieving efficiency without sacrificing accuracy.
- Its suitable for tasks like image classification and object detection in resource-constrained environments such as smartphones and IoT devices.



Results

Accuracy - 75%



Conclusion

- The facial emotion recognition project has successfully demonstrated the effectiveness of transfer learning in training accurate emotion recognition models.
- The models have achieved high accuracy rates in recognizing various facial expressions.

Future Scope

- Further research can focus on improving the models' performance in recognizing subtle facial expressions.
- The models can also be applied to real-time emotion recognition systems for various applications, such as mental health monitoring and human-computer interaction.

