Final Project

Art Style Classification

Group Members:

Mostafa Younes Mostafa Younes	**120210289**
Ahmed Saeed Hassan Mahrous	**120210349**
Mohamed Yasser Mohamed Elshoky	**120210381**

CSE 429: Computer Vision and Pattern Recognition

Submitted To: Dr. Ahmed Gomaa

Proposal

Problem Statement

The goal of this project is to automatically classify artistic paintings by their style (Impressionism, Cubism, Surrealism) using deep learning. When someone uses the system, the expected input is a digital image of a painting, and the desired output is the predicted art style label. This system can assist in organizing digital art collections, aiding art historians, and enhancing user experiences in digital museums or search engines.

Approach

We use a supervised deep learning approach based on a customized VGG19 convolutional neural network architecture. The network is trained to recognize and differentiate between various painting styles using labeled artwork images from the WikiArt dataset. The original high-resolution images are preprocessed and resized to 128×128 pixels for faster training and reduced memory usage. Image normalization and data augmentation (flipping, rotation, etc.) are applied to improve model generalization. Transfer learning and fine-tuning on VGG19 pretrained on ImageNet are used to improve accuracy and reduce training time.

Experiments and Results

Experimental Setup:

Dataset: WikiArt Dataset (downloaded from Kaggle). It includes paintings labeled by style.

Preprocessing: Resize to 128×128, convert to RGB JPEGs, compress (quality=75), and store in an optimized directory.

Frameworks Used: TensorFlow-Keras.

Model Architecture: Pretrained VGG19 with modified fully connected layers for multi-class classification.

Implementation Plan:

Preprocessing and optimizing the dataset.

Building and training the custom VGG19 model.

Evaluating model performance using accuracy, precision, recall, and confusion matrix.