CLASSIFICATION OF ART PIECES

Domain Background

- An art is something that is created with imagination and skill.
- Art in its broadest sense is a form of communication. It means whatever the artist intended and feel is represented in the form of art.
- Art is an act of expressing feelings, thoughts, and observations.
  The most common concept of art as pieces of work whether paintings or sculptures. Indeed art surrounds life, every people in every location. Since time is immemorial, art has existed as long as man. It is a huge part of our culture which shapes our ideas, provides us with a deeper understanding of emotions, self-awareness and more.
  Art work is used for various purposes now-a-days.
  - Decoration
  - Hobby
  - Expressing emotions
  - Religious purpose
  - Social activities i.e from ancient times, people uses paintings and art works to express their protest against their rulers.

  Reference link:
  http://www.totalartsoul.com/index.php?option=com_content&task=view&id=2510&Itemid

  There are many types of artistic works or pieces around the world but I took 5 of them to classify

Drawings: Drawing is a form of visual **art** in which a person uses various drawing instruments to mark paper or another two-dimensional medium. ... A drawing instrument releases a small amount of material onto a surface, leaving a visible mark.

Works of paintings: Painting is the practice of applying paint, pigment, color or other medium to a solid surface (support base). The medium is commonly applied to the base with a brush, but other implements, such as knives, sponges, and airbrushes, can be used. The final work is also called a painting

Sculpture: A sculpture is a work of art that is produced by carving or shaping stone, wood, clay, or other materials.

Graphic Art: The fine and applied arts of representation, decoration, and writing or printing on flat surfaces together with the techniques and crafts associated with them.

Iconography: Iconography, as a branch of art history, studies the identification, description, and the interpretation of the content of images: the subjects depicted, the particular compositions and details used to do so, and other elements that are distinct from artistic style. The word iconography comes from the Greek εἰκών ("image") and γράφειν ("to write").

A secondary meaning (based on a non-standard translation of the Greek and Russian equivalent terms) is the production of religious images, called "icons", in the Byzantine and Orthodox Christian tradition

Reference link: https://en.wikipedia.org/wiki/Art

Personal Motivation

- ✓ I choose this project because I am really inserted in learning Convolutional Neural Networks. I know project somewhat challenging but still I am taking this project to learn Convolutional neural networks.
- ✓ In this project I can learn how to handle the image data and pre-processes datasets for the training the data.
- ✓ In this project I am going to learn how to use the kaggle kernels.

Problem Statement

The aim of this project is to predict or classify the type art pieces it belongs to by visualizing image. In this project I am going to use keras by adding convolutional layers.

Datasets and Inputs

The dataset I am working is downloaded from

https://www.kaggle.com/thedownhill/art-images-drawings-painting-sculpture-engraving

The dataset contains about 9000 different styles of art's images

Content:

The dataset contains train and validation sets separately. The images are divided into classes: drawings, paintings, sculpture, graphic arts such as engraving and iconography. For each class there are 1000 to 2000 images. Photos are not reduced to a single size, they have different proportions.

The data collection is based on the Google images, yandex images. Dataset for classifying different styles of art. Main categories have been taken from: http://rusmuseumvrm.ru/collections/index.php?lang=en . The data is open-sourced and can be downloaded for education purpose with no citation.

Solution

My solution is to apply Keras by adding Convolution Layers and optimizer as 'adam' and finally I am going to identify the Accuracy of my model.

Benchmark Model

- For this project, I want to set worst benchmark model by adding only one convolution Layer and Max pooling layer and dense layers with 2 units.
- I will try to improve the benchmark model accuracy by adding sufficient layers to the model.

Evaluation Metrics

I want to use accuracy as evaluation metric for classification of arts. Accuracy is a common metric for categorical classifiers

Accuracy = (images correctly classified) / (all images)

During development, a validation set was used to evaluate the model. The validation set is already given in the data set which I was considered. For validation I want to use "categorical_crossentropy" as loss metric for CNN, optimizer as "adam" and also metrics as "accuracy".

Project Design

Step 1: PREPROCESSING THE DATA

- Here we want to preprocess the images and divide the dataset into training and testing data sets. The validation dataset is already given.
- Keras has the ImageDataGenerator class which allows us to perform the image augmentation and normalization.
- The class have a method named flow_from_directory () which will load the train and test datasets into different directories. There is no need to create validation set as there is one which is given in dataset.

Step 2: CREATE A SEQUENTIAL MODEL

- For the Benchmark model, there will be only one convolution layer, max pooling layer and dense layer.
- To improve these benchmark model accuracy ,I will add more layers with activation function as 'softmax' or 'sigmoid'.
- Dropout is a regularization technique which is used for reducing overfitting in neural networks by preventing complex co-adaptations on training data.

Step 3: VISUALIZATION RESULT

- After the model is completed ,I will visualize the training set results as well as testing results and validation results.

Sample Images


Drawing


Painting


Sculpture


Engraving


Iconography

Anumukonda .Poojitha,

Machine Learning Nano Degree,
Capstone Project Proposal,

Classification of Art Pieces,

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