Machine Learning Engineer Nanodegree

Capstone Project

Classifying Art Pieces Data Set

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Proposal:

Classifying Art Pieces Data Set

**I. Definition:**

**Project Overview:**

In this project, I am working on classifying art pieces.

 Art has been a part of our life for as long as humanity has existed. For thousands of years people have been creating, looking at, criticizing, and enjoying art. Art is something that captures the eye. Whether the artist is trying to communicate an emotion, an idea or something else, the most important thing is how well the audience receives it. Art is something that inspires people, something that transports us into different realities and moves us into the subconscious places that we did not know existed.

History: Greeks have extensively used and produced many arts. The Greeks regarded both sciences and crafts as belonging to the realm of art. The Greeks included *music* together with poetry in the sphere of inspiration. (Note has been taken from)

<https://sites.google.com/site/encyclopediaofideas/literature-and-the-arts/classification-of-the-arts>

When we think on classification, there are several issues to consider. Whether it is really art/not art. There is a really good article on whether something considered as art or not and Correlation with Appraisal and Viewer Interpersonal Differences. This has something more depend on human psychology. We are not going to dwell into that.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5640778/>

**here we are clearly making an assumption, everything we encountered here is an ART.**

When thinking about this classification of art one thing is important. First, it was concerned  
not with the products of art but with the act of producing them and in particular the *medium* to produce them.

Based on Medium used for producing,

There are many different types of art like animation, architecture, assemblage, calligraphy, ceramics, computer, Christian or religious, conceptual, artistic design, drawing, folk, graffiti, graphic, illuminated manuscript, illustration, mosaic, painting, performance, photography, sculpture, stained glass, tapestry, and video. Subclassifications include chalk, charcoal, pen and ink, watercolors, acrylics, miniature painting, engraving, lithography, screen printing, wood carving, dance, and acting.

With best advances in Machine Learning like CNN we can clearly, achieve a solution to classify arts based on medium of production.

This solution has very good applications,

1. can used by kids in schooling to Cleary differentiate between arts based on medium. And it is easy to use.
2. Can be used for research purposes on different categories of arts.

We can also expect good performances around 80% accuracy with this project as we are considering only a sub category of different forms of arts.

We can even extend this algorithm to remaining categories.

In this project, I have taken 5 different art forms to classify and their relevant description.

1. Paintings - Painting is the practice of applying paint, pigment, color or other medium to a solid surface **(Wikipedia).**
2. Drawings - Drawing is a form of visual art in which a person uses various drawing instruments to mark paper or another two-dimensional medium **(Wikipedia).**
3. Sculpture - Sculpture is the branch of the visual arts that operates in three dimensions. The earliest example of sculpture dates back to the Upper Paleolithic period (40,000 to 10,000 years ago) **(Wikipedia).**
4. Engravings - Engraving is the practice of incising a design onto a hard, usually flat surface by cutting grooves into it with a burin **(Wikipedia).**
5. Iconography (old Russian art): Iconography, as a branch of art history, studies the identification, description, and the interpretation of the content of images **(Wikipedia).**

**Problem Statement:**

To understand the difference between types of art forms based on medium. The aim of this project is to predict the type of art form it belongs to by visualizing image. Here I am doing a multi-class classification.

In the project, I am going to use various Machine Learning Algorithms like CNN (Convolutional Neural Networks) and MLP (Multi-Layer Perceptron’s) to predict the types of images and compare their performance and finally declare my final model.

Here created model will take an image as input and produce the category of medium is used to draw.

**Metrics**

I want to use accuracy as evaluation metric for art pieces classification as it is a common metric for categorical classifiers

Accuracy can be described as

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

As mentioned in capstone proposal feedback, I also added classification report and confusion matrix for all models.

The model which shows prominent feed back on accuracy metric will going to considered as my final model.

I am also intended to plot accuracy and loss of model at different stages of model training for a clear visual deception towards good decision making