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Image Painting Classification

This project aims:

- to classify images of paintings, determining whether they belong to the same artist or not.
- Building a neural network that can analyze the visual features of paintings and make predictions based on similarities and differences between them.
- To make a model that makes representation for images in a lower dimension.

Architecture of the neural network

Siamese network:

- Explanation:
  - It is a class of one or more neural networks that are identical.
  - We use the same architecture for each network.
  - They share the same parameters and weights.
  - In our case we have 3 identical neural networks.
- Architecture of the neural network:
  - An input of 3 x 244 x 244 (that's what ResNet are trained on).
  - ResNet18 with pretrained weights.
  - The result of the ResNet18 is a vector of length 1000.
  - A fully connected layer reduces the dimensionality from 1000 to 512.
  - A fully connected layer reduces the dimensionality from 512 to 256.

Forward pass:

- $Image_1$, $image_2$, $image_3$ are the three inputs.
- We denote our network by f.
- We pass the images through the network.
- $f(image_i)$, $i \in \{1, 2, 3\}$, represent the output of the encoding.

Triplet loss function:

- Explanation:
  - It takes three images as an input.
  - Those three images must be:
    - The first image we pick it randomly and name it anchor.
    - The second image we pick randomly such that it is drawn by the same artist and not the same image and name it positive.
    - The third image we pick randomly such that it is drawn by a different artist and name it negative.

- it aims to enhance the separation between the anchor and negative samples while reducing the gap between the anchor and positive samples.

Method used to evaluate

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