

MAIS 202 — Project Deliverable 1

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1 Dataset

There will be two datasets used in this project. The first data set is a handpicked set of famous paintings, and the second is the Microsoft COCO dataset [1].

2 Methodology

2.1 Data Preprocessing

We may have to crop the images into squares so that the architecture is easier to implement. Otherwise, we will need to add padding to all the non-square images. Furthermore, if computation is too costly, we may have to downscale the images.

2.2 Machine Learning Model

We will train an image transformation network to learn to style different images in the styles of various famous paintings. In order to do this, we will need to train an image classifier or use a pre-trained model. Another possibility is to use the optimization method for style transfer, where we directly use gradient descent to converge into the stylized image. The main advantage of the optimization method is that no training data is needed. However, stylized image generation is more costly this way. A last possibility is to do arbitrary style transfer. The main advantage of this is that the network will be able to transfer styles even between unseen paintings, instead of training an image transformation network for each individual painting. However, a large dataset of paintings will be needed. Note that no matter which model is used, we will need a pre-trained classification network to do style transfer.

2.3 Final Conceptualization

Our final project will consist of a single landing-page webapp, where the user is able to upload an image and select a painting which will provide the style of the generated image. The image transformation network will run on the client side using `tensorflow.js`.

References

- [1] Microsoft. Coco dataset. <http://cocodataset.org/#home>.