Machine Learning 2 - Final Project Proposal

- Image colorization by using General Adversarial Network

Introduction

The aim of the project is helping balck and white pictures to get colors. By using this technology in extence, we can turn those old black and white movies into vivid color movies. Also, in some 2D animation production industry and in some industries that require a large amount of manual coloring, this technology can help people complete the coloring work in batches in a very short time.

Dataset Description

We use Flickr1024 for project dataset.(https://yingqianwang.github.io/Flickr1024/) Flickr1024 is a large-scale stereo image dataset which consists of 1024 high-quality image pairs and covers diverse scenarios including: Animals, Buildings, People, Plants, etc. This dataset is 2.64GB. We think it is large enough for training a deep network for now. If the model is not good enough, we may find more data to use.

Methodology

We will use GAN to realize Image colorization. The network is a standard form so far as our target right now are pictures. If we have enough time to do the video colorization in the future, customized networks would be applied. For the framework, we will use Pytorch. Pytorch is flexible to use and implement new ideas compared with other frameworks.

Reference

1. Unsupervised Diverse Colorization via Generative Adversarial Networks.https://arxiv.org/pdf/1702.06674.pdf
2. Style Transfer for Anime Sketches with Enhanced Residual U-net and Auxiliary Classifier GAN https://arxiv.org/pdf/1706.03319.pdf
3. User-Guided Deep Anime Line Art Colorization with Conditional Adversarial Networks https://arxiv.org/pdf/1808.03240.pdf

Performance Evaluation

We will use JS and KL divergence first. We may try wasserstein distance if the model is hard to train with JS and KL divergence.

Project Plan

11.2-11.09	Literature research
11.09-11.16	Implement algorithm and train model
11.16-11.23	Tuning Parameters and evaluating the model
11.23-11.30	Keep improving model and tuning parameters based on performance
11.30-12.07	Finishing tuning parameters, write report and prepare for the presentation