draw2pix: Generative Networks for Bad Artists

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Abstract

1. Introduction

We are investigating unpaired image-to-image translation with generative adversarial networks. This work was demonstrated in [2]. Work done in the same lab [1] demonstrates how we can use paired images in training to create an image-to-image mapping from one domain to another. The specific image-to-image task that we're aiming to implement is this, which demonstrates a couple examples of sketch-to-photo translations trained using the pix2pix model. We aim to do something similar, using CycleGAN to instead train on unpaired images. The relaxation that unpaired training gives us allows for easier creation of datasets and combinations of domains – we can simply swap a whole domain and retrain rather than find image-to-image pairs for that specific translation task. Our project differs from [3] in that we aren't doing multi-modal image translation, just from one domain to another. We are essentially implementing the demo from [1] with an unpaired dataset and architecture matching that of [2]

2. Related Work

describe some of these, how they relate
GAN
The original Generative Adversarial Network (GAN) proposed by Goodfellow et al. proposes a network that learns an approximation of a distribution of data p_X. CycleGAN
pix2pix
pix2pix demo
SketchyGAN
CoGAN

3. Problem Statement

describe image-to-image translation, use cases, motivation

4. Technical Approach

describe cyclegan

5. Dataset

describe sketchy dataset

6. Baseline Results

describe cogan method, results

References

[1] P. Isola, J. Zhu, T. Zhou, and A. A. Efros. Image-to-image translation with conditional adversarial networks. *CoRR*, abs/1611.07004, 2016.

[2] J. Zhu, T. Park, P. Isola, and A. A. Efros. Unpaired image-to-image translation using cycle-consistent adversarial networks. *CoRR*, abs/1703.10593, 2017.

[3] J. Zhu, R. Zhang, D. Pathak, T. Darrell, A. A. Efros, O. Wang, and E. Shechtman. Toward multimodal image-to-image translation. *CoRR*, abs/1711.11586, 2017.