

# draw2pix: Generative Networks for Bad Artists

Cedrick Argueta  
Stanford University  
450 Serra Mall, Stanford, CA 94305  
cedrick@cs.stanford.edu

Kevin Wang  
Stanford University  
450 Serra Mall, Stanford, CA 94305  
kwang98@stanford.edu

## 1. Introduction

We are investigating unpaired image-to-image translation with generative adversarial networks. This work was demonstrated in [3]. 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 [4] 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 [3]

## 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

We will be using a subset of the Sketchy dataset, as described in [2]. The dataset consists of a crowd-sourced collection of sketch-photo pairs. The total collection consists of 75,471 sketches of 12,500 photos (125 object categories). We will be working specifically with the 'tree' subset, which consists of 100 photos and 534 sketches. Although there is a naturally defined pairing between photos and sketches, we will be ignoring this mapping in our implementation of the unpaired translation.

## 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] P. Sangkloy, N. Burnell, C. Ham, and J. Hays. The sketchy database: learning to retrieve badly drawn bunnies. *ACM Transactions on Graphics (TOG)*, 35(4):119, 2016.
- [3] 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.
- [4] 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.