2019 Head Start Silicon Valley
C-Team

Ji-Hye Shin

Jin-Gyeong Park

Young-Ki Kim

Problem we want to solve

1. Painting is HARD

2. We think is painting is hard because of coloring

3. We want to offer amateur painters a translated image of their sketch to fully colored painting so they can easily get inspiration for coloring their sketch

Project Goal

We want to give amateur painters a fully-colored sample of their sketch that has similar filling of famous artist

sketch drawn by me

transferred into Monet style

How to transfer image??

Basically we want to transfer image domain X(sketch) to other image domain Y(painting of famous artist).

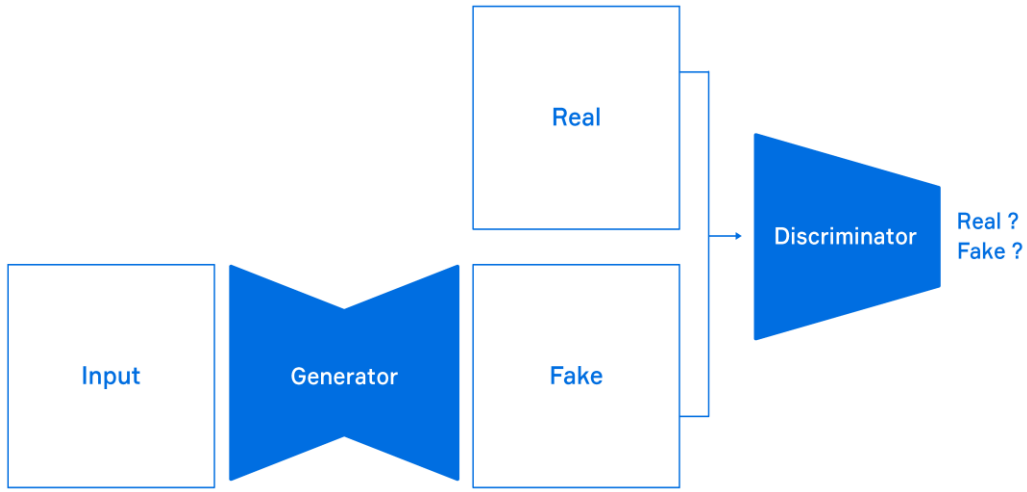
In this case, we can use a very well-known GAN algorithm variation called Cycle-GAN

To understand Cycle-GAN, you need a little bit of understanding of GAN(Generative Adversarial Network).

GAN is made of 2 elements.

Discriminator and generator, usually both are made out of ANN(Artificial Neural Network).

Discriminator and Generator



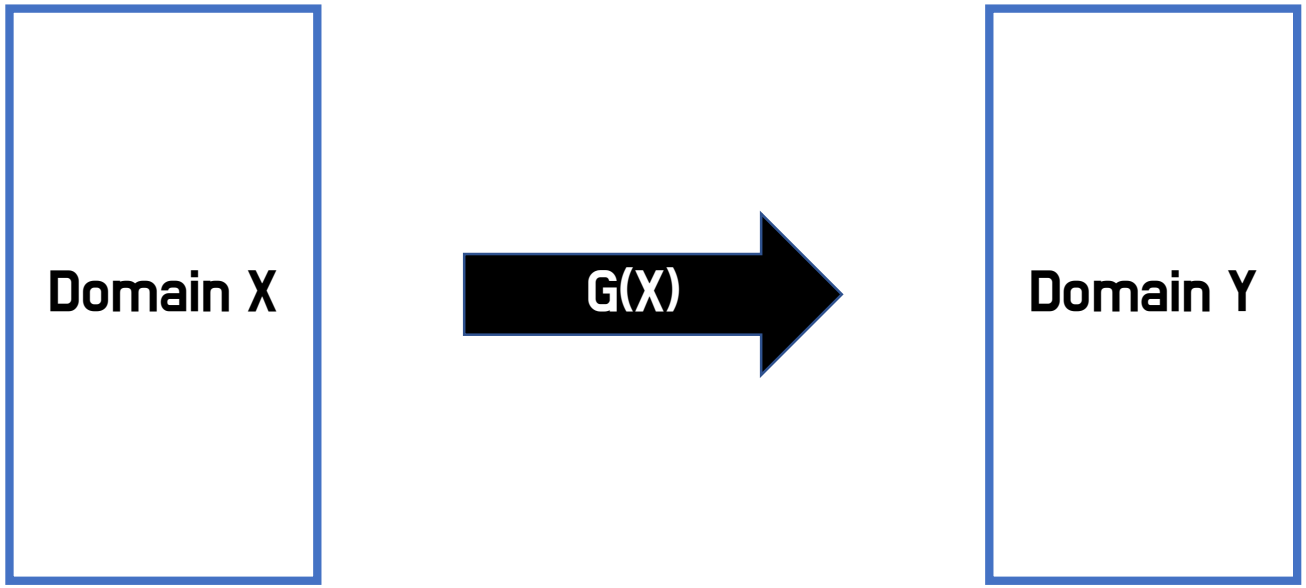
Discriminator tries to be better at discriminate the image made from generator.

Generator tries to be better at making fake image that can deceive discriminator.

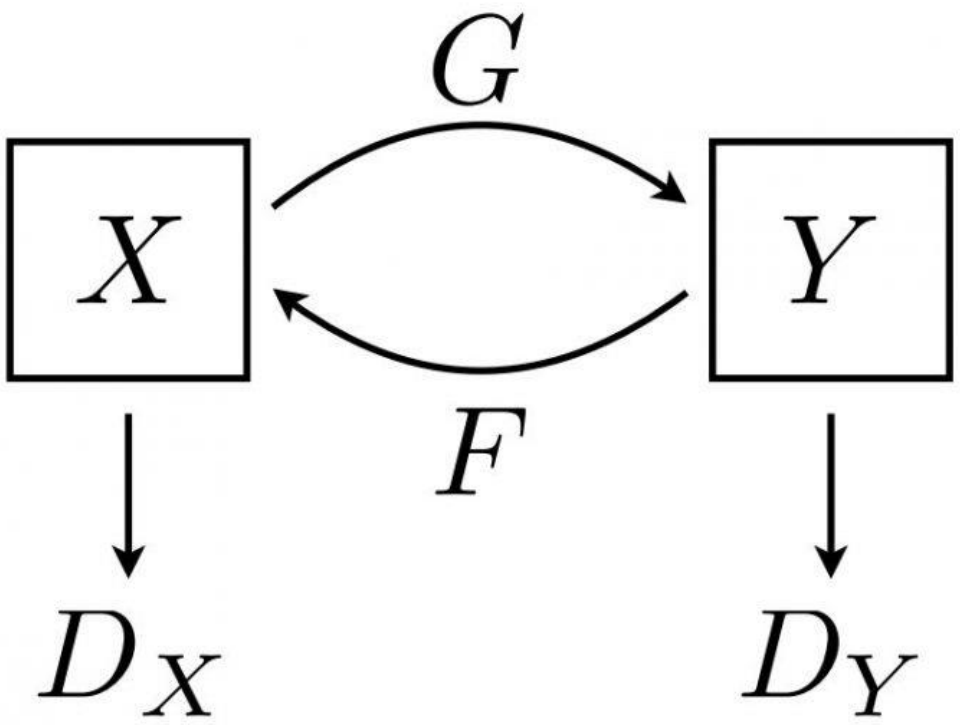
By competing each other, model learns to generate more real-like images.

Cycle-GAN

The Goal of Cycle-GAN is to learn mapping $G: X \rightarrow Y$ such that $G(X)$ is indistinguishable from the distribution Y.



Cycle-GAN Model

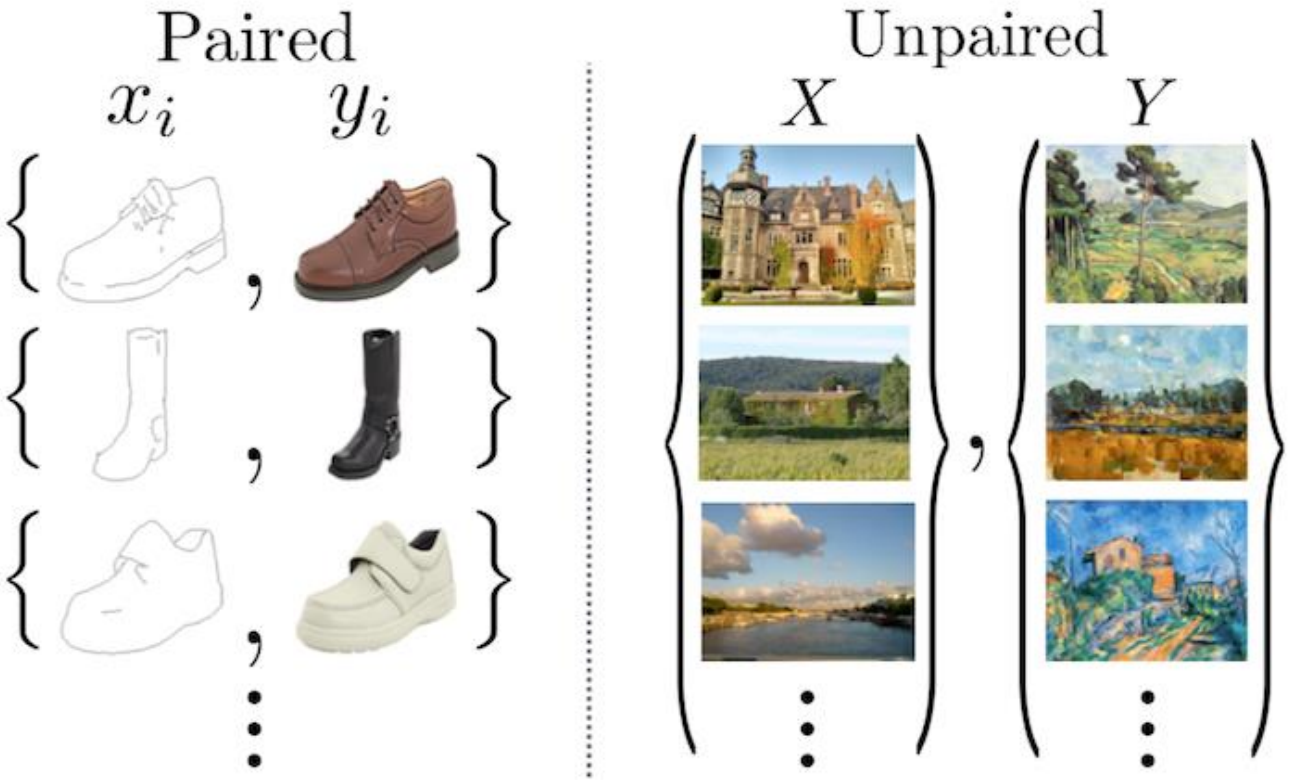


Cycle-GAN uses 2 discriminator(Dx, Dy) and 2 generator/mapping(G, F) to learn mapping G.

This kind of model can consider consistence like

$$F\big(G(X)\big) \approx X$$

Unpaired Data

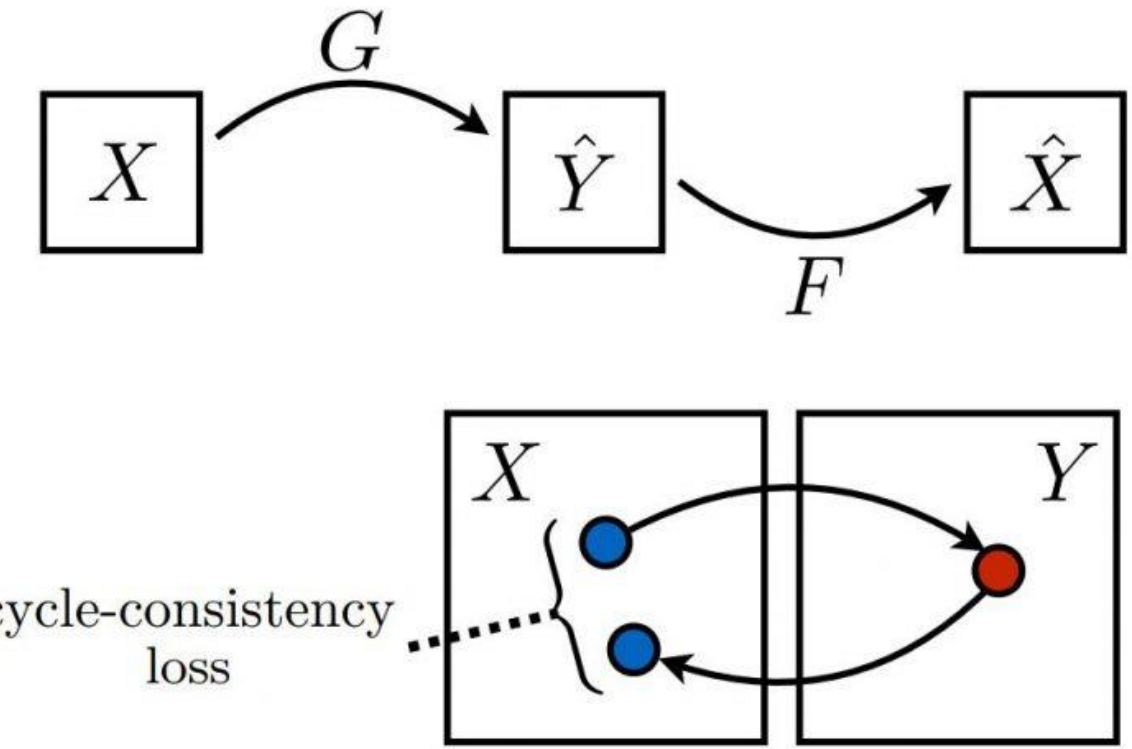


Cycle-GAN uses unpaired training data unlike traditional image translation algorithm.

Which makes data collecting very easy process but has a problem.

A network can map the same set of input image to any permutation of image in target domain

Cyclic - Consistency Loss



So, for better real-life performance we consider cyclic -consistency loss.

Which is basically a difference between X and $F\big(G(X)\big)$

Train Setting

Domain X : Sketch image data we found online. (We crawled it on google image)

Domain Y : Painting of famous artist. (such as Monet, Gogh, Cezanne)

We trained each model using GCP (Google Cloud Platform) for about 10 hours each.

We didn’t have many choice of dataset ,compute power and time so we concentrate of landscape sketches

Train Result

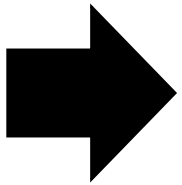
sketch

Monet

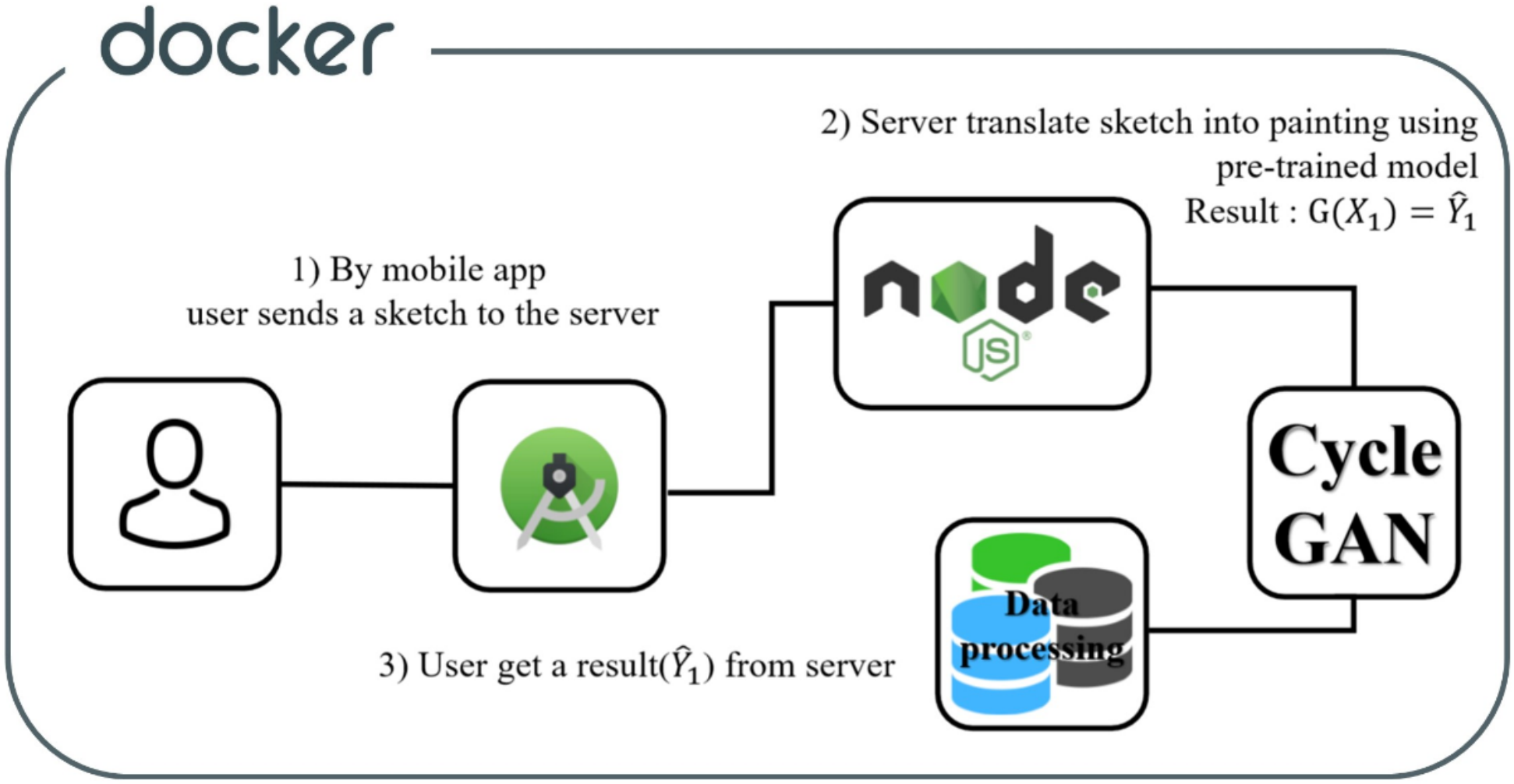
Cezanne

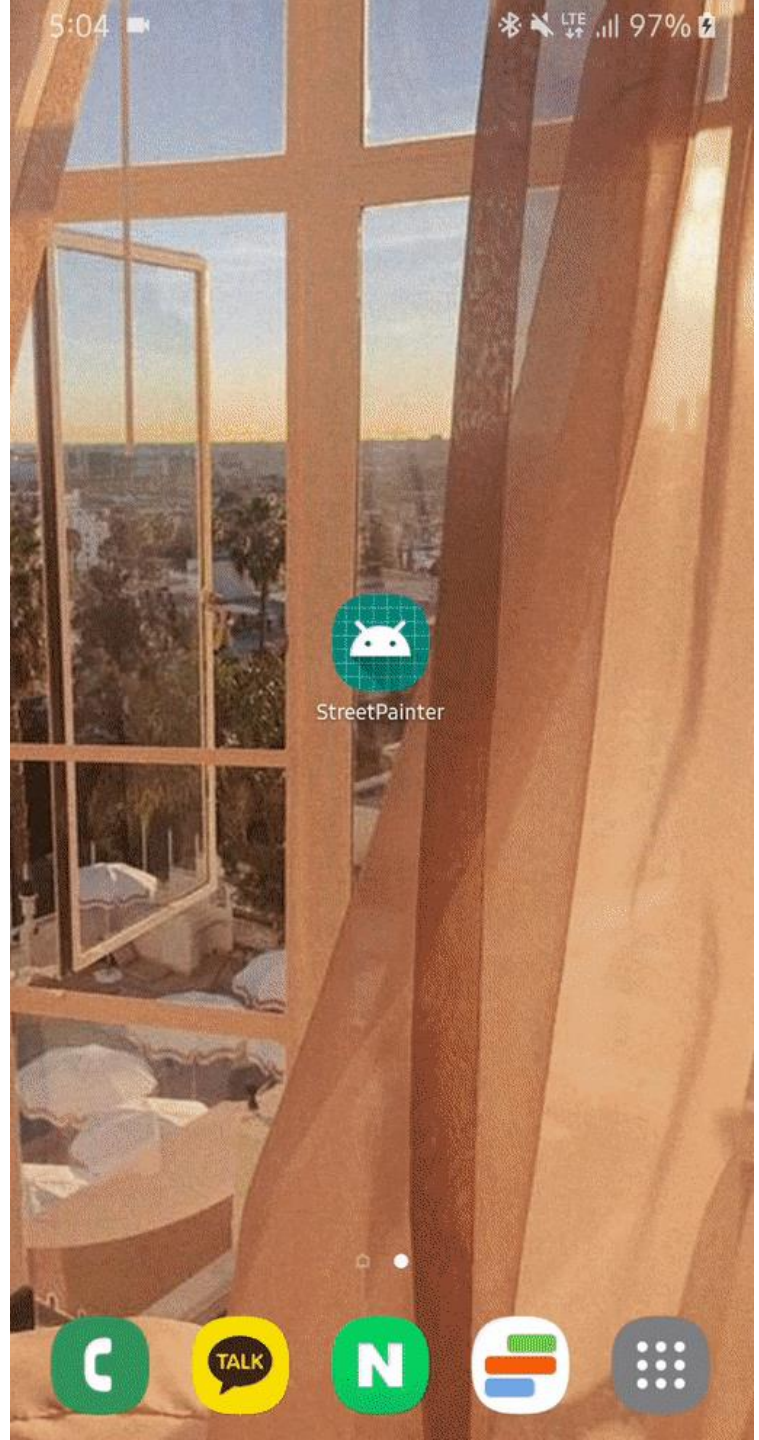
Van Gogh

VectorStock®
VectorStock.com/38502609



Development Status




5:04
97%
StreetPainter
TALK

hsvc

https://github.com/hsvc

Repositories 3 | Packages | People 4 | Teams | Projects | Settings

Find a repository... | Type: All | Language: All | Customize pins

AppSketch

android app front for camera & sketch2art

Java 0 1 0 0 Updated in 15 hours

SPServer

Nodejs Server for Sketch2Art + DockerFIle

Python 2 1 1 1 Updated in 15 hours

Top languages

Python Java

People

Reference

GAN (Paper) : **Generative Adversarial Networks**

Goodfellow, Ian and Pouget-Abadie

Cycle-GAN (Paper) : **Unpaired Image-to-Image Translation using Cycle-Consistent Adversarial Networks**

Zhu, Jun-Yan and Park

Cycle-GAN (CODE) : **https://github.com/xhujoy/CycleGAN-tensorflow**