

# WOMEN'S CLOTHING E\_COMMERCE WITH GANS

Exploration about Text to Image Synthesis using Generative  
Adversarial Networks

- Univariate Analysis
- Multivariate Analysis
- Text feature extraction
- Sentiment Analysis
- Supervised Learning
- *Can we find a more intuitive way to show the value of data?*

A word cloud centered around the word "dress". Other prominent words include "cute", "pretty", "beautiful", "flattering", "love", "great", "beautifull", "dress", "summer", and "fit". The words are colored in various shades of blue, green, yellow, and pink.

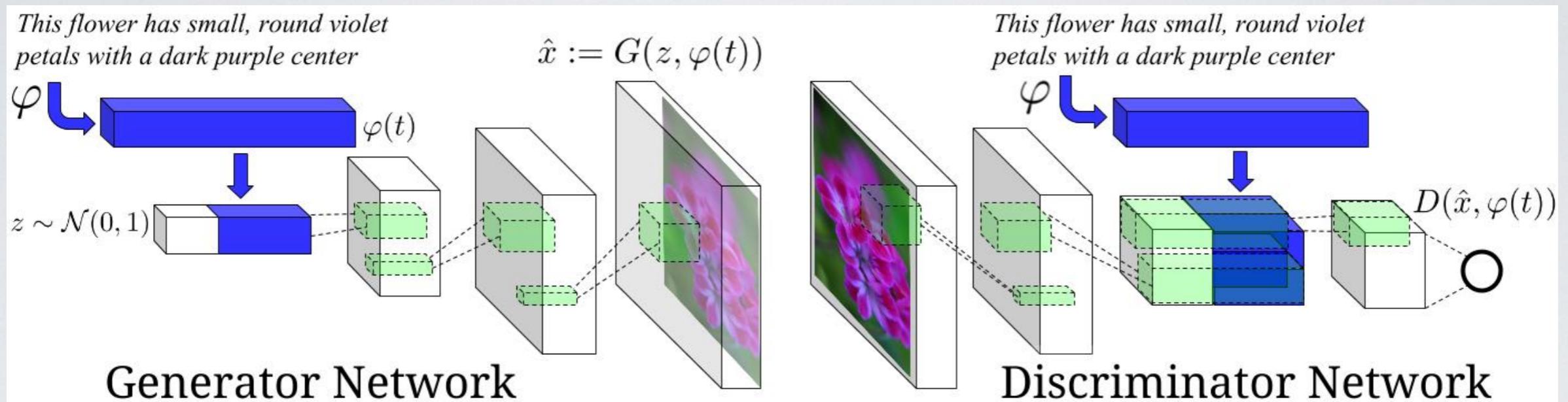
Material  
quality  
super  
versatile  
casual  
comfortable  
gorgeous  
fitting  
comfy  
wanted  
love  
dress  
great  
body  
need  
dress  
sweater  
swing  
dress  
cute  
elegant  
darling  
easy  
maxi  
weird  
pink  
short  
cute  
vintage  
large  
work  
long  
print  
dress  
gorgeous  
lovely  
large  
great  
print  
dress  
adorable  
flowy  
love  
nice  
fall  
dress  
cute  
every  
winter  
perfect  
enough  
well  
flirty  
spring  
dress  
so  
new  
favorite  
dress  
beautiful  
design  
product  
dress  
fun  
make  
tunic  
really  
size  
unique  
wrong  
fun  
flattering  
very  
quite  
wear  
right  
feminine  
blue  
disappointed  
bad  
run  
odd  
look  
fell  
better  
dress  
pretty  
soft  
concept  
yet

[Pink/Blue] [Vintage] [Flirty] [Soft] [Summer] [Dress]

It would be nice if we could generate images based on some words.

# Generative Adversarial Text to Image Synthesis

(Scott Reed ICML 2016)



- Generator Network: Text Encoding(Embedding) → Relu+N(0,1) → Convolution → Generator Pictures
- Discriminator Network: Convolution → Feature map+Embedding → Convolution → Reasonable and Match
- Style transfer: Picture → Random Vector → Vector+Embedding → Style picture

# Generative Adversarial Text to Image Synthesis

(Scott Reed ICML 2016)

*This bird has a white breast and belly and a small bill.*



*Small, roundish bird with off white breast and belly, light brown crown, brown and black coloured wings.*



GAN-INT: Learn to fill in gaps on the data manifold in between training points by interpolated text embeddings.

GREAT!  
WHAT WE NEED IS ONLY A GOOD  
DATA SET!  
GREAT!

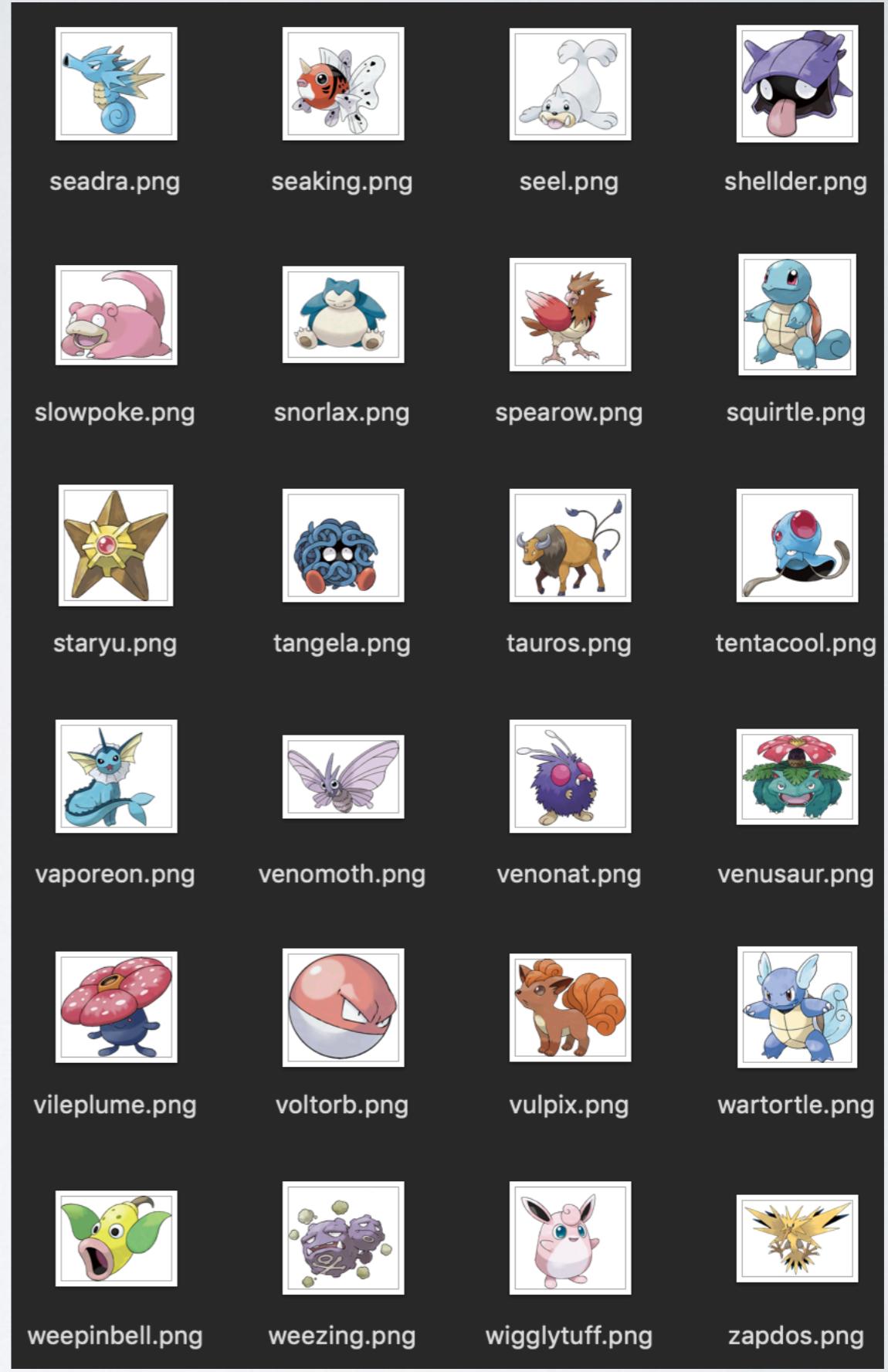
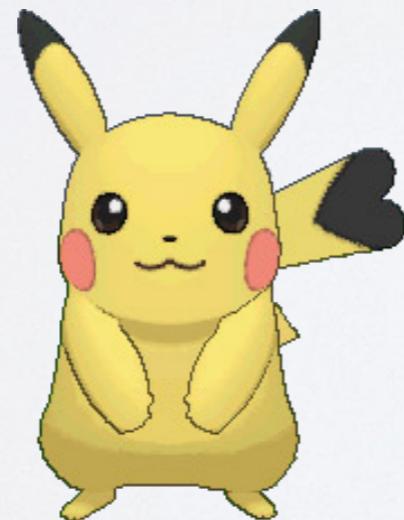
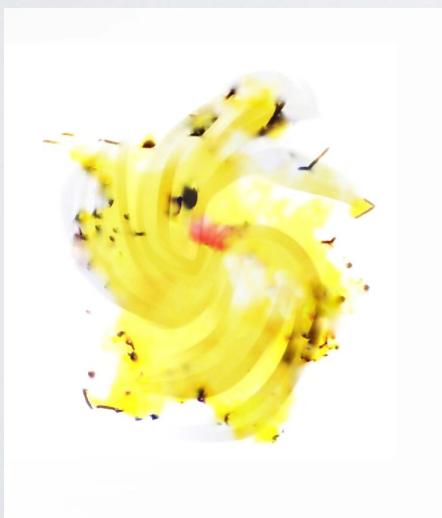
# Example: Pokémon Database

- Bulbasaur is a small, quadruped Pokémon that has turquoise skin with darker teal patches. It has red eyes with white pupils and scleras. It also has pointed, ear-like structures on top of its head. Its snout is short and blunt, and it has a wide mouth. A pair of small, pointed teeth are visible in the upper jaw when its mouth is open. Each of its thick legs ends with three sharp claws. On its back is a green plant bulb, which is grown from a seed planted there at birth.



# Experiment: Pikachu

- Pikachu is a short, chubby rodent Pokémon. It is covered in yellow fur with two horizontal brown stripes on its back. It has a small mouth, long, pointed ears with black tips, brown eyes...



EMM · · ·

WE STILL NEED A GOOD DATA

SET





# FASHION-MNIST

Fashion-MNIST is a dataset consisting of a training set of 60,000 examples and a test set of 10,000 examples. Each example is a 28x28 grayscale image, associated with a label from 10 classes.

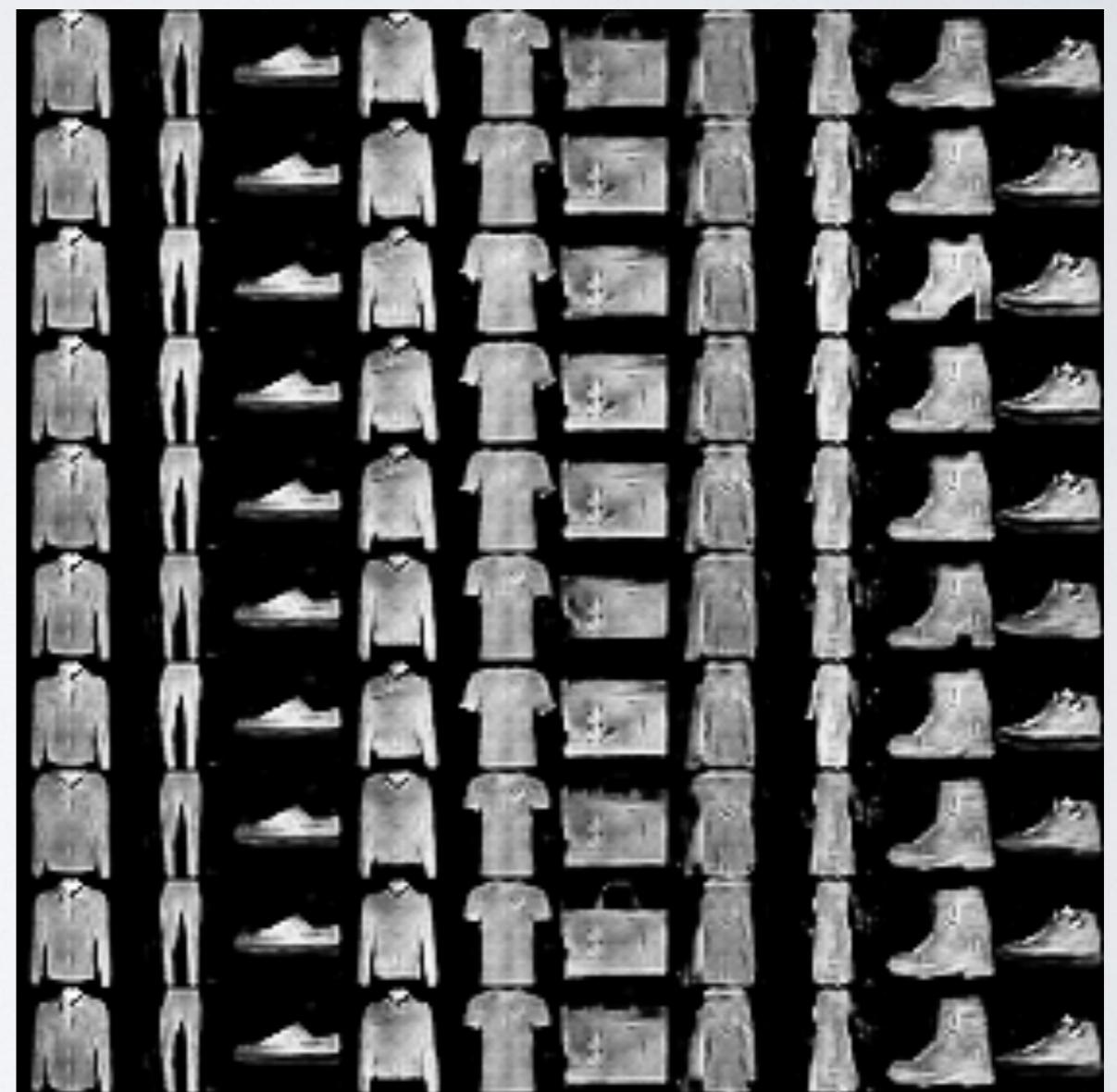
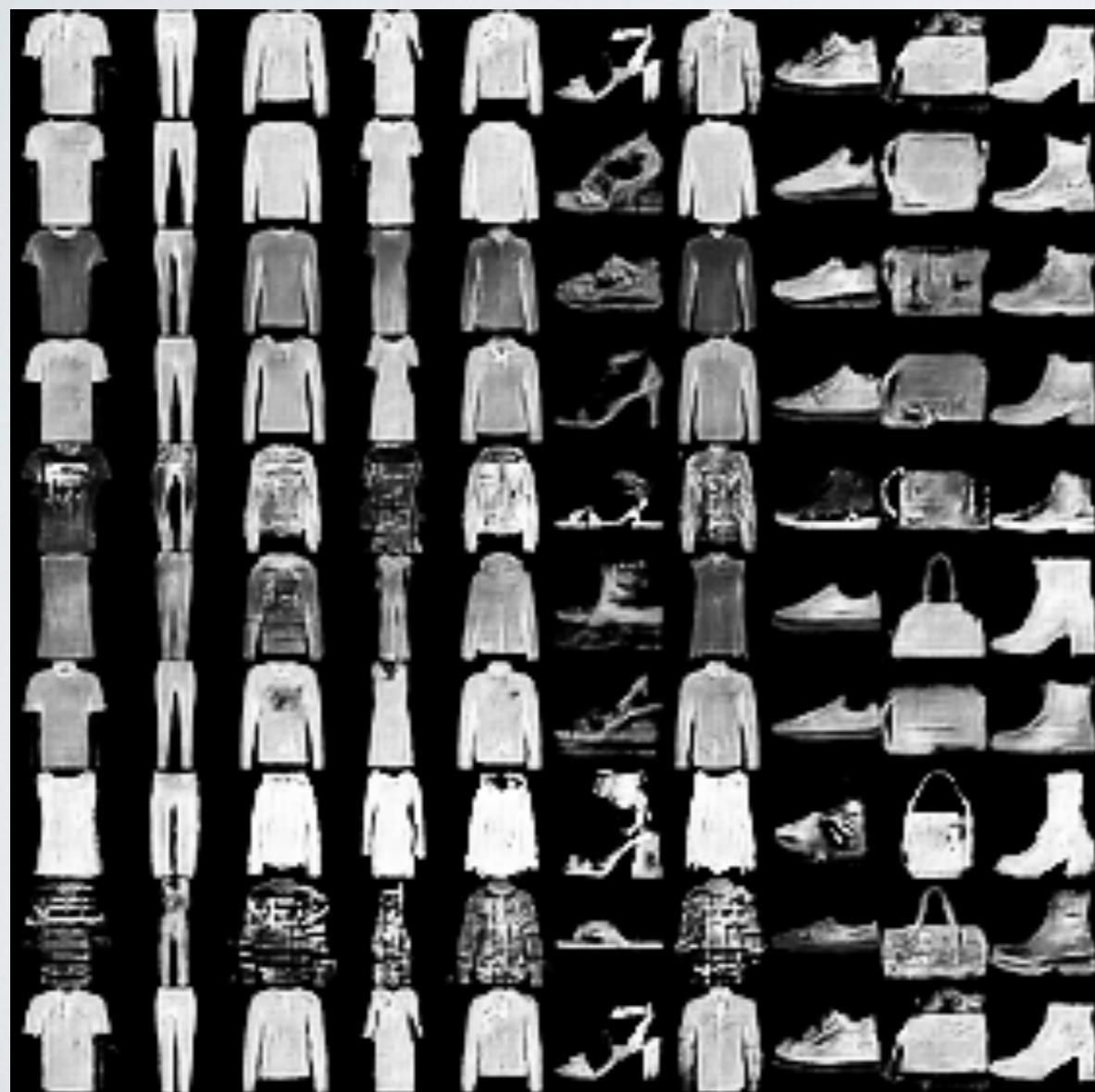
- **0 T-shirt/top**
- **1 Trouser**
- **2 Pullover**
- **3 Dress**
- **4 Coat**
- **5 Sandal**
- **6 Shirt**
- **7 Sneaker**
- **8 Bag**
- **9 Ankle boot**



Fashion-MNIST serves as a direct drop-in replacement for the original MNIST dataset for benchmarking machine learning algorithms. It shares the same image size and structure of training and testing splits.

# InfoGAN: Interpretable Representation Learning by Information Maximizing Generative Adversarial Nets

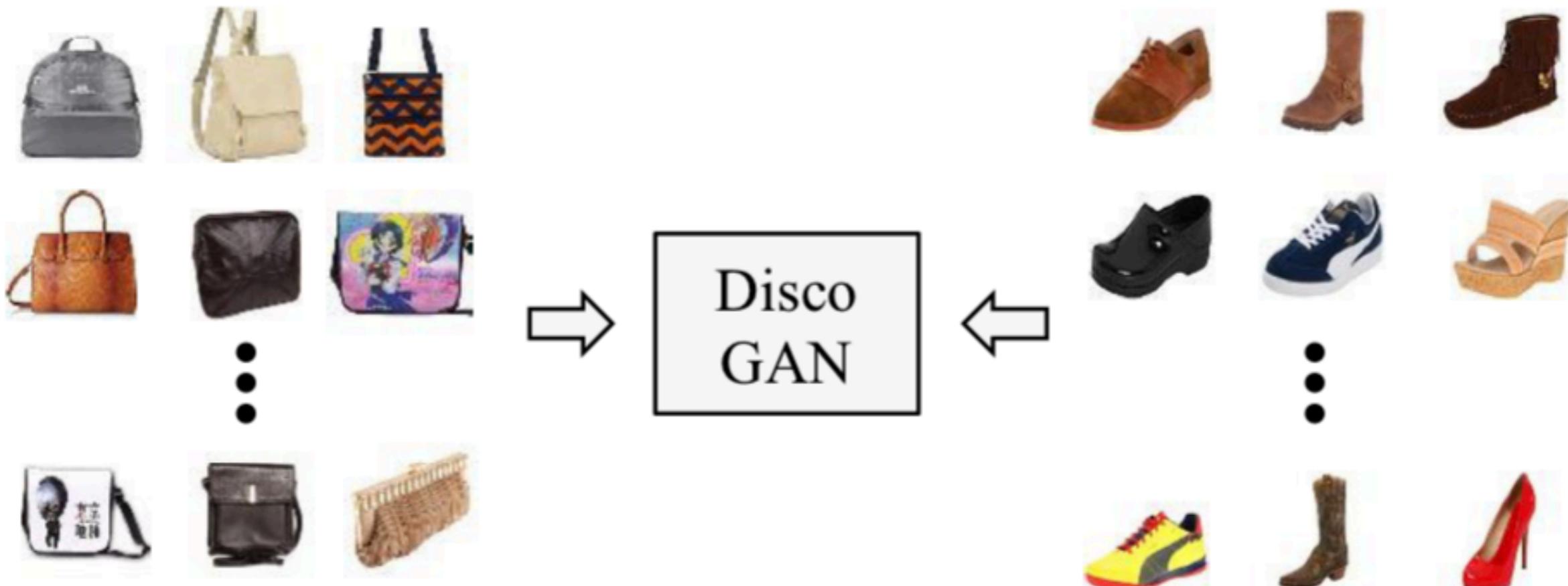
(Chen NIPS 2016)



More: Discover Relations Between Different Domains

# Learning to Discover Cross-Domain Relations with Generative Adversarial Networks

(Kim 2017)

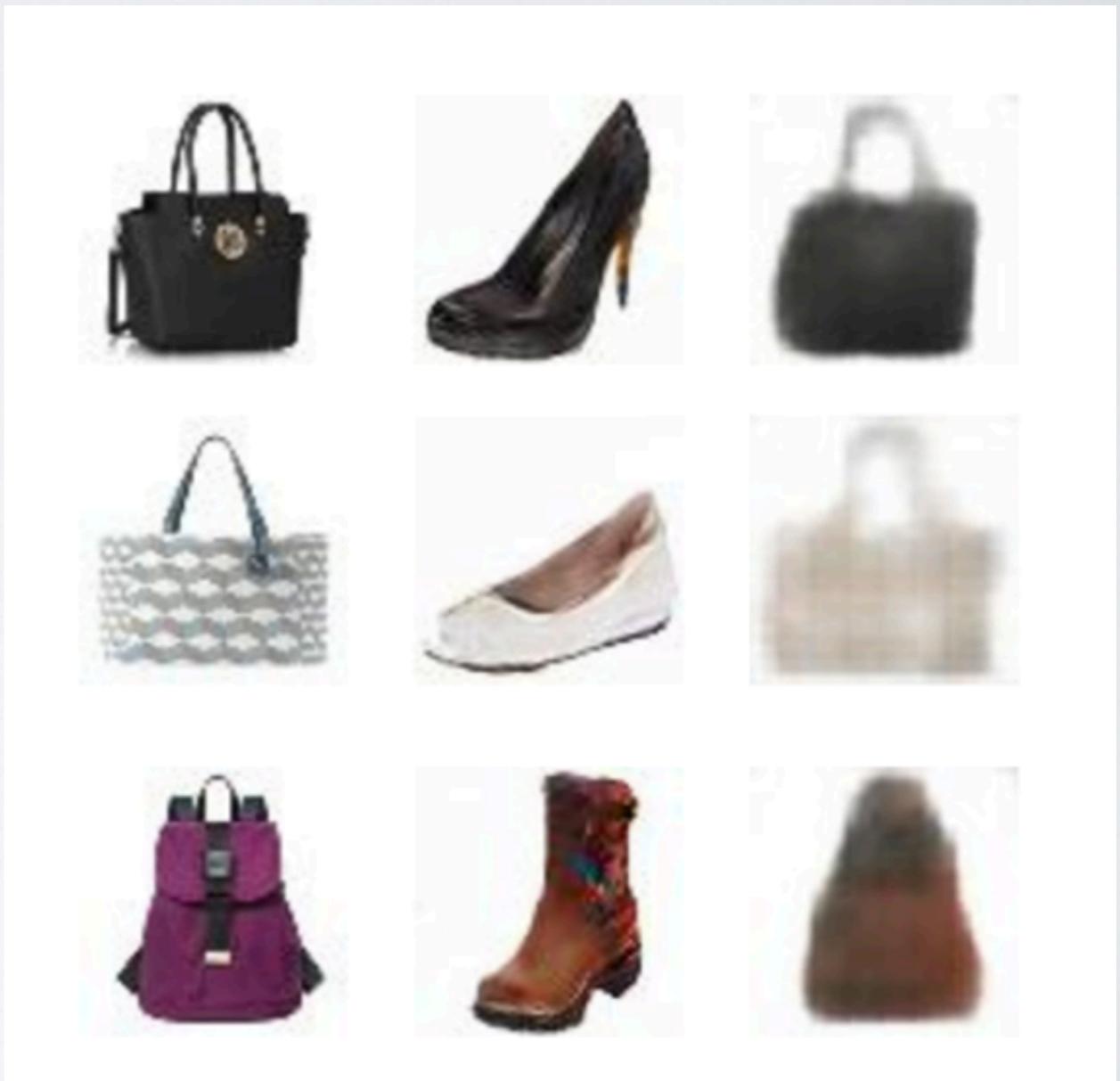


(a) Learning cross-domain relations **without any extra label**

- Using the discovered relations transfers style from one domain to another while preserving key attributes

# Experiment: Handbags to Shoes

- Two domains that are visually very different, where shared features are not explicit even to humans
- Discover the fashion style as a related feature between the two domains
- Not only similar colors and patterns, but also similar level of fashion formality as the input fashion item.



Thank you~