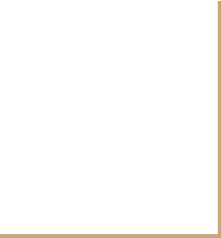




AI Costume Designer

Han Yan Vivianna
2022.11.18



OBJECTIVE

No more ideas and **inspirations?**

Tired of seeing the **boring** clothes options?



This generator will be your muse,
or an entertainment to the eyes.

GENERATE COSTUME DESIGN
THAT DOESN'T EXIST

DATA

2544 images

from

The Metropolitan Museum of Art

New York



6588 images

from

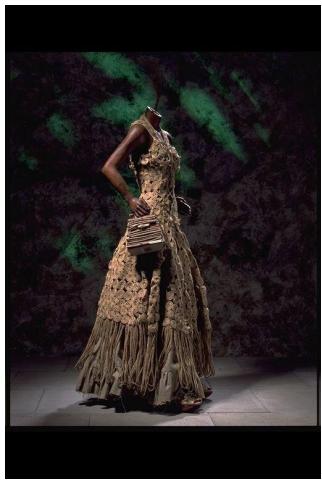
Victoria and Albert Museum

London





Sample images



Stylish photography

METHODS

- Web scraping
 - Data cleaning
 - Image processing
 - Folder management
 - Tensorflow/Keras
-

WEB SCRAPING

- museum API
- organized
- shoot in certain format
- high resolution images



The screenshot shows a detailed view of a costume record from the V&A website. At the top right is a thumbnail image of the costume. Below it is a header with the title 'Theatre Costume' and a date '2004 (made)'. A yellow box highlights the 'Object details' section, which contains information about the costume's design, materials, and history. Another yellow box highlights the 'Related objects' section, which lists other items from the collection. On the left, there's a sidebar with a search bar and a list of categories like 'Home & Garden', 'Arts & Crafts', 'Textiles', etc. At the bottom, there's a section for 'Newly catalogued' items.

ARTIST/MAKER
Long, William Ivey (costume designer)
Academy Costumes Ltd (theatrical costumiers)

PLACE OF ORIGIN
London (made)

CATEGORIES
Entertainment & Leisure | Stage Costumes

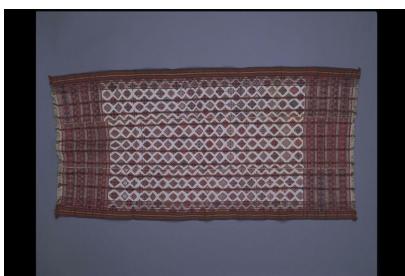
OBJECT TYPE
Theatre costume

MATERIALS AND TECHNIQUES
Stockinette, organza, chiffon, lamé, diamanté, artificial jewels, beads, plastic, hair, ostrich feathers, foil, leather, paint and fibreglass

A web page of a costume from V&A museum



Similar shooting style



special categories

WEB SCRAPING

Pay attention to minority cultures

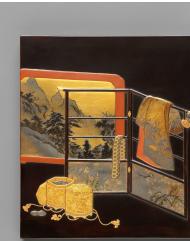
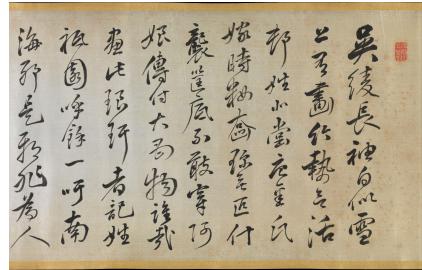


DATA CLEANING

- Grayscale



- Unrelated





Costume details

IMAGE PROCESSING - square the image

mirror



original vs processed



It doesn't work well
for some images.

IMAGE PROCESSING

stretch (the row / column of pixels on edge)



original vs processed
A horizontal image

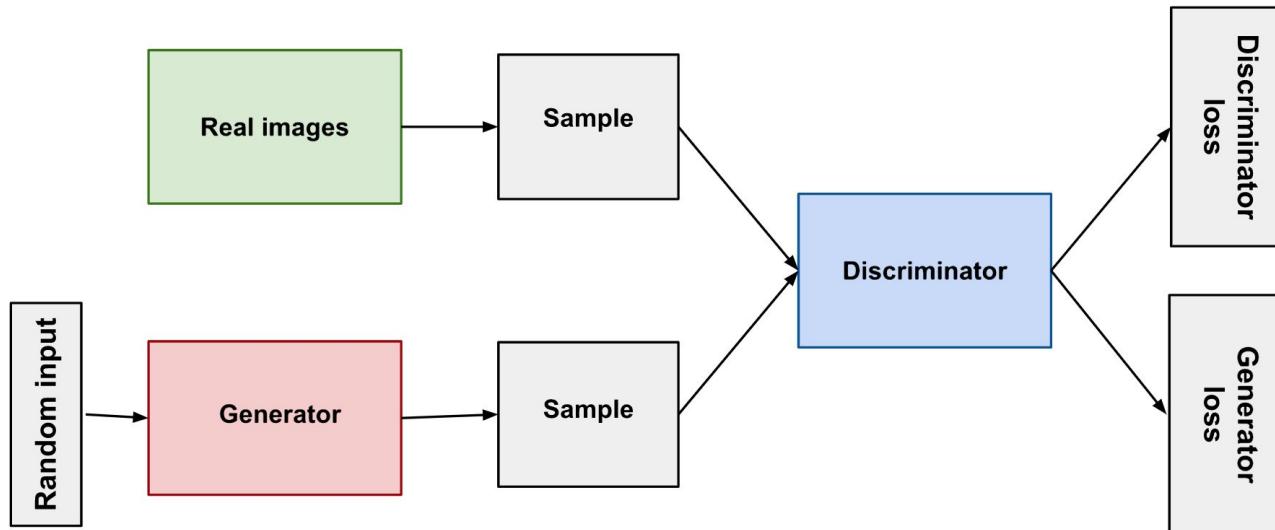


original vs processed
A vertical image

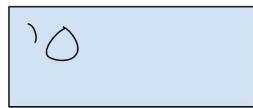
Models

- tensorflow/keras
 - GAN
-

GAN - Generative Adversarial Network



Source: https://developers.google.com/machine-learning/gan/gan_structure



← FAKE → REAL



Painter
generator



Judge
discriminator

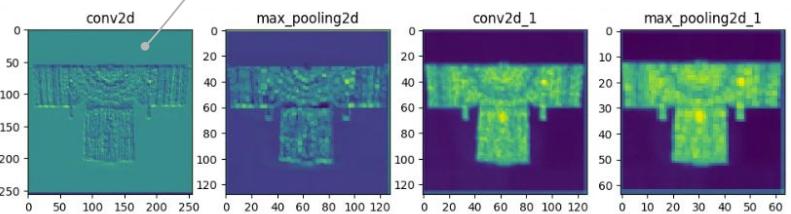


Concept figure of how discriminator and generator works

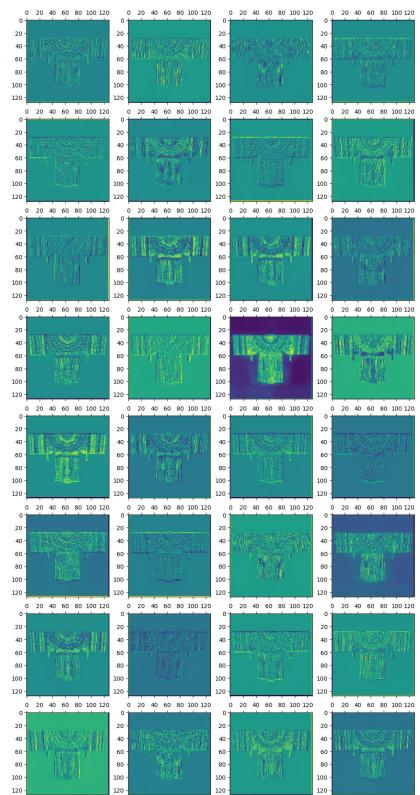
DISCRIMINATOR



Original image

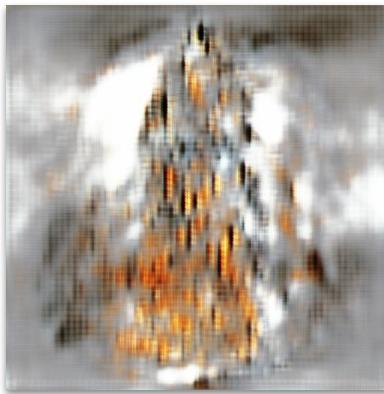
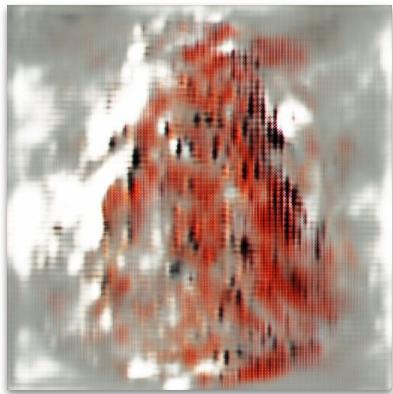


how the discriminator 'see' the images



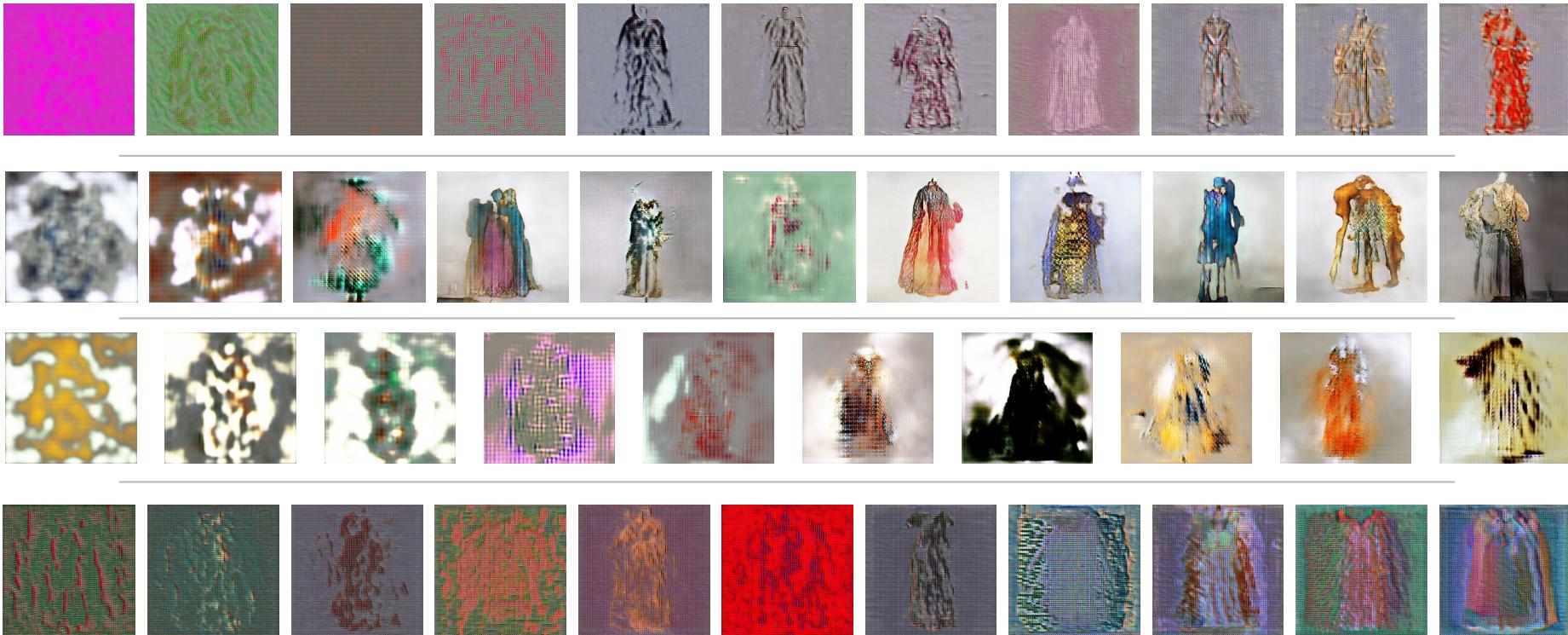
The filters in First layer

BASELINE - best results



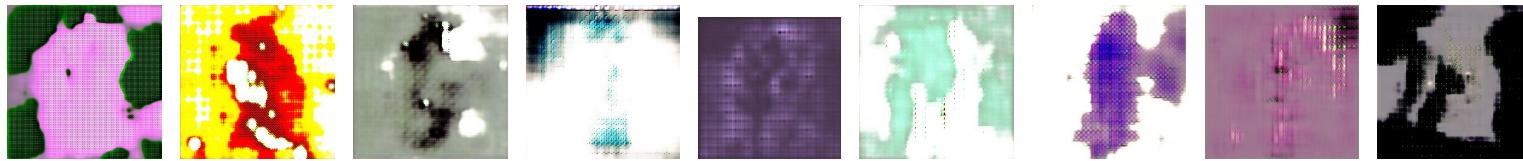
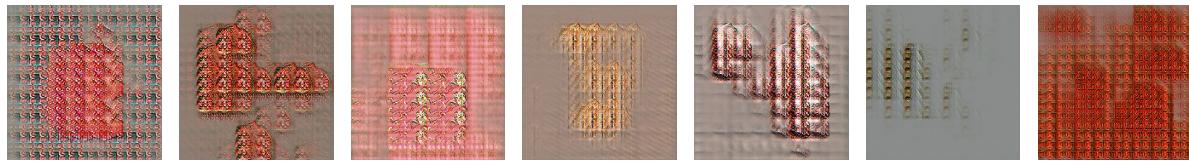
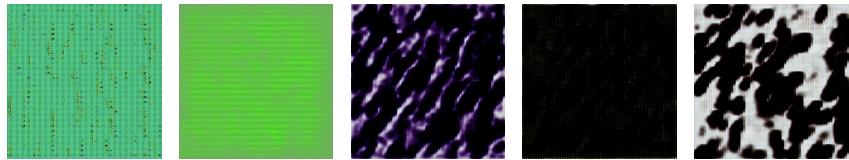
ATTEMPTS TO IMPROVE

- Pre-trained model: VGG19
 - More images: from 2544 to 9132
 - Increase the complexity
 - More conv2D, introducing maxpool
 - More epochs / train more
 - Different architectures
 - Improve input/output size
-



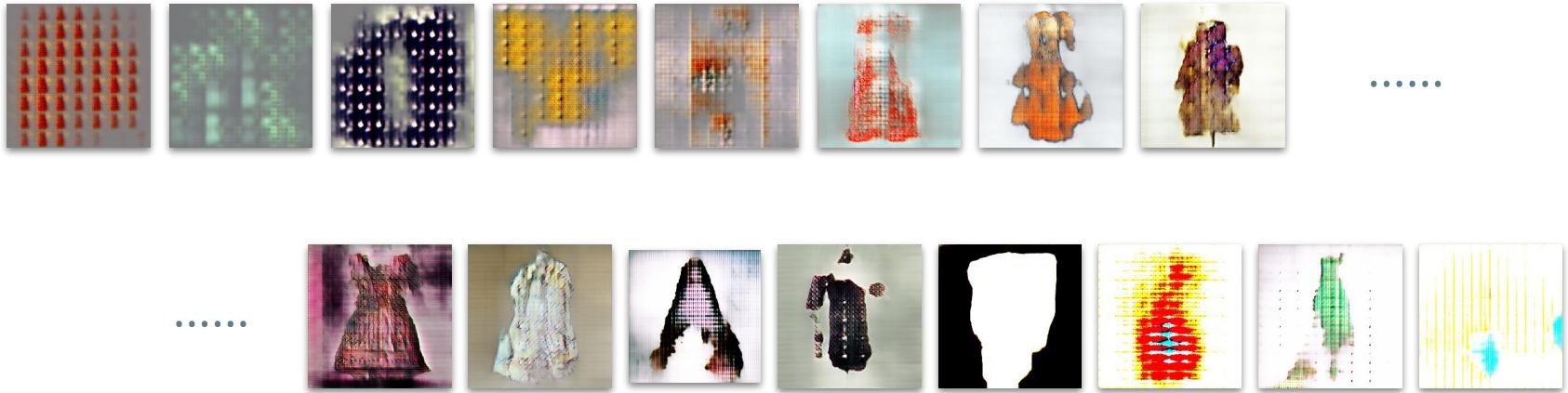
Note: one line is one training progress

Sometimes the results looked promising/interesting...



Note: one line is one training progress

Sometimes the results were totally off...



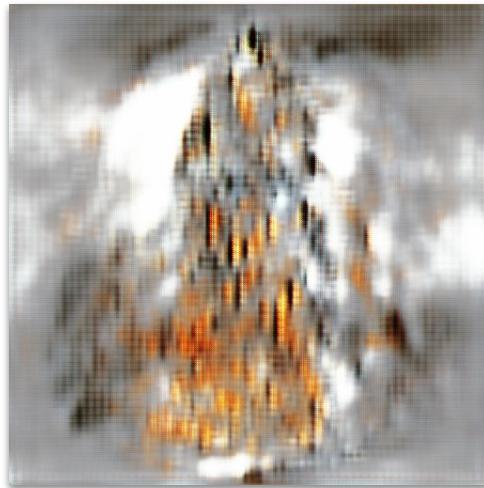
Sometimes training longer didn't lead to a good result...

AFTER HOURS AND HOURS
TRAININGS AND TESTING...

FINAL MODEL



BASELINE vs FINAL



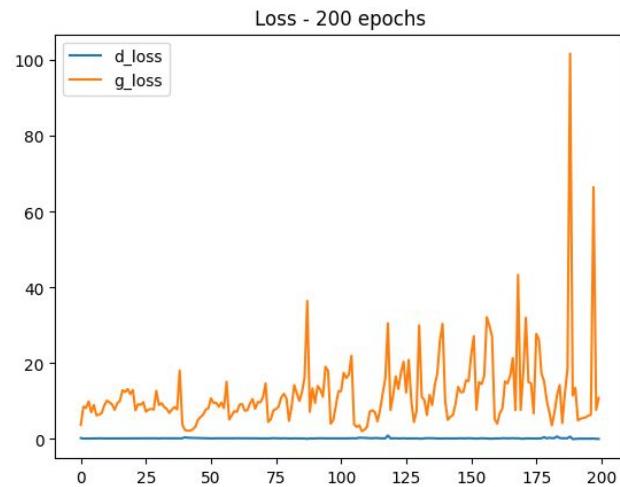
baseline



final

Future attempts

- More training images
- Conditional GAN to let users pick certain categories
- Higher resolution output
- Pretrained models
- ...



Final model progress

TECHNOLOGY CHANGED THE WORLD.

THANKS!



www.linkedin.com/in/viviannayan/
github.com/vivyhasadream
www.youtube.com/user/ViviannaYan
www.viviannayan.com