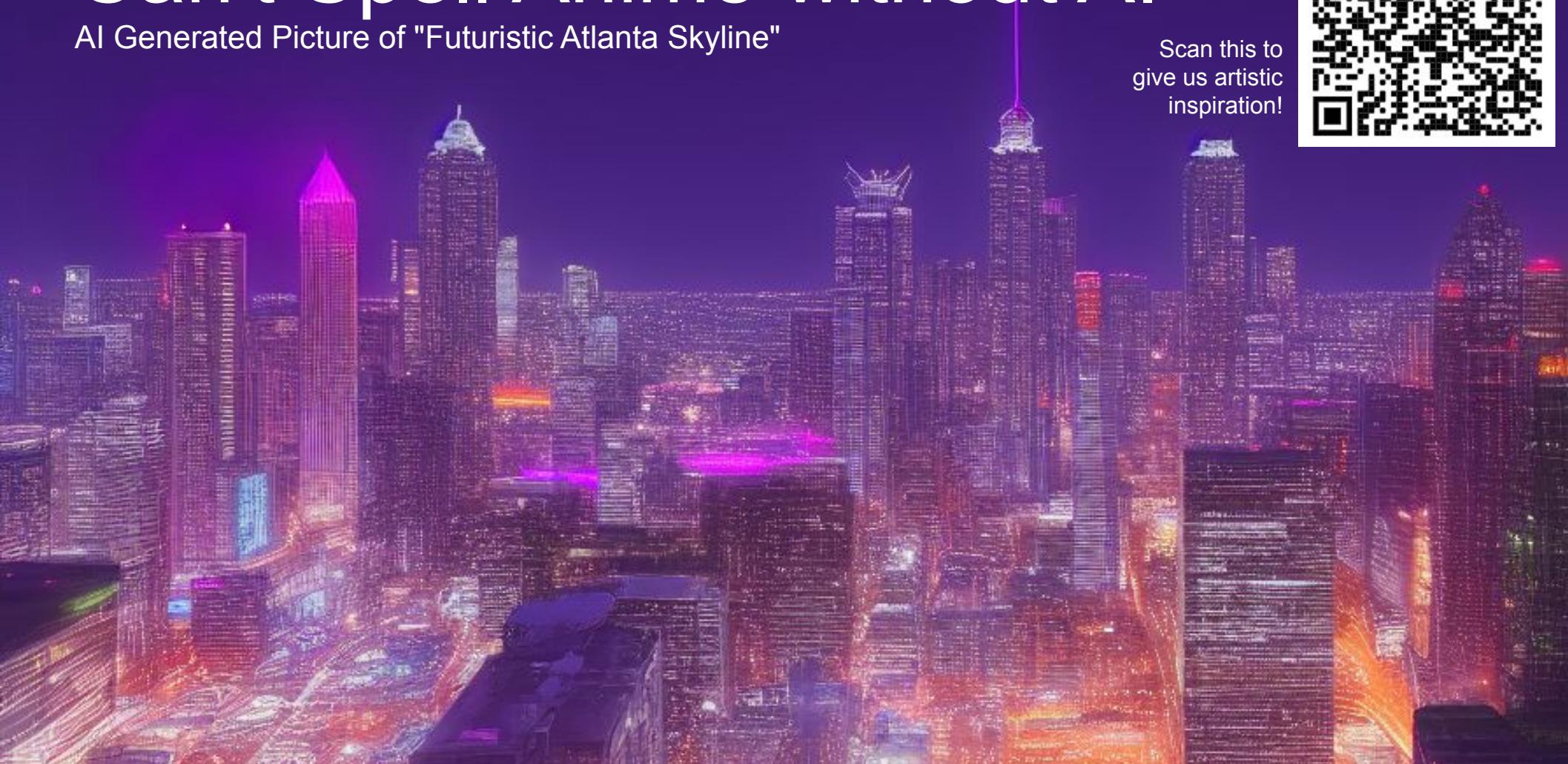


Can't Spell Anime without AI

AI Generated Picture of "Futuristic Atlanta Skyline"

Scan this to
give us artistic
inspiration!



Introductions



Kiran Kokilepersaud

PhD Student, Georgia Tech, Electrical & Computer Engineering Program

Favorite Anime: Grimgar of Fantasy and Ash



Brighton Ancelin

PhD Student, Georgia Tech, Machine Learning Program

Favorite Anime: Attack on Titan



Max Xu

PhD Student, Georgia Tech, Machine Learning Program

Favorite Anime: A Silent Voice

Interact with the Panel!

Please fill out as much of the following form as you want:



Audience

We think this presentation is most useful for...

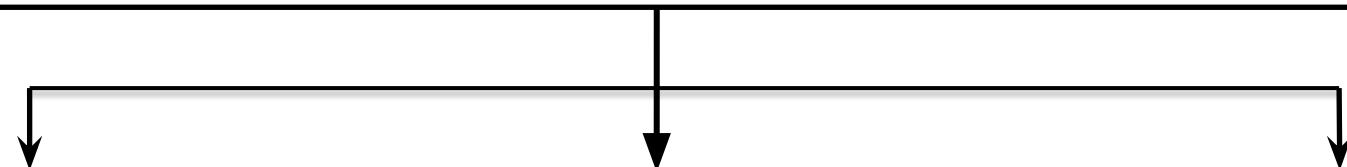
- Artists
- Weebs
- Computer Geeks
- Everyone interested in Artificial Intelligence

Free and Open Source

This presentation was developed using free-and-open-source software; references to almost every source used today is freely available at:

github.com/kkokilep/Cant-Spell-Anime-Without-AI

Goal: Convince you all that we are cool, smart, and handsome.



Style Transfer

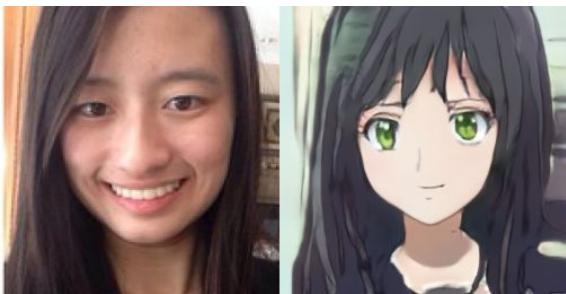


Image Coloring Manga/Art

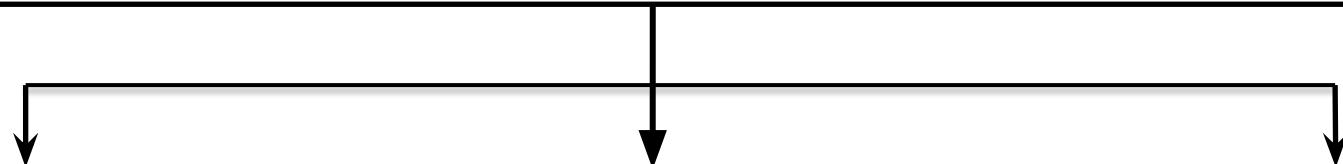


Art Generation



The newest JoJo stand!

Goal: Convince you all that we are cool, smart, and handsome.



Style Transfer



Image Coloring Manga/Art



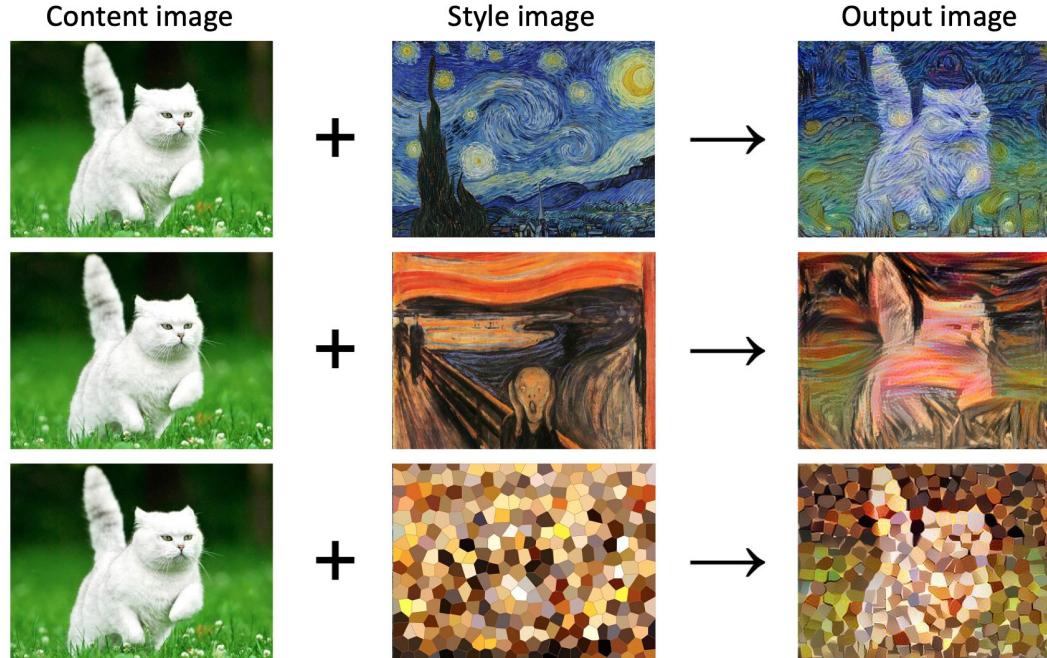
Art Generation



The newest JoJo stand!

What is Style Transfer?

Recompose the content of an image in the style of another.



Anime Style Transfer

Given an image of a person, then redraw it in another anime style.



How does it work?

In a traditional approach, we have inputs and targets, but rare to have pictures in multiple different styles

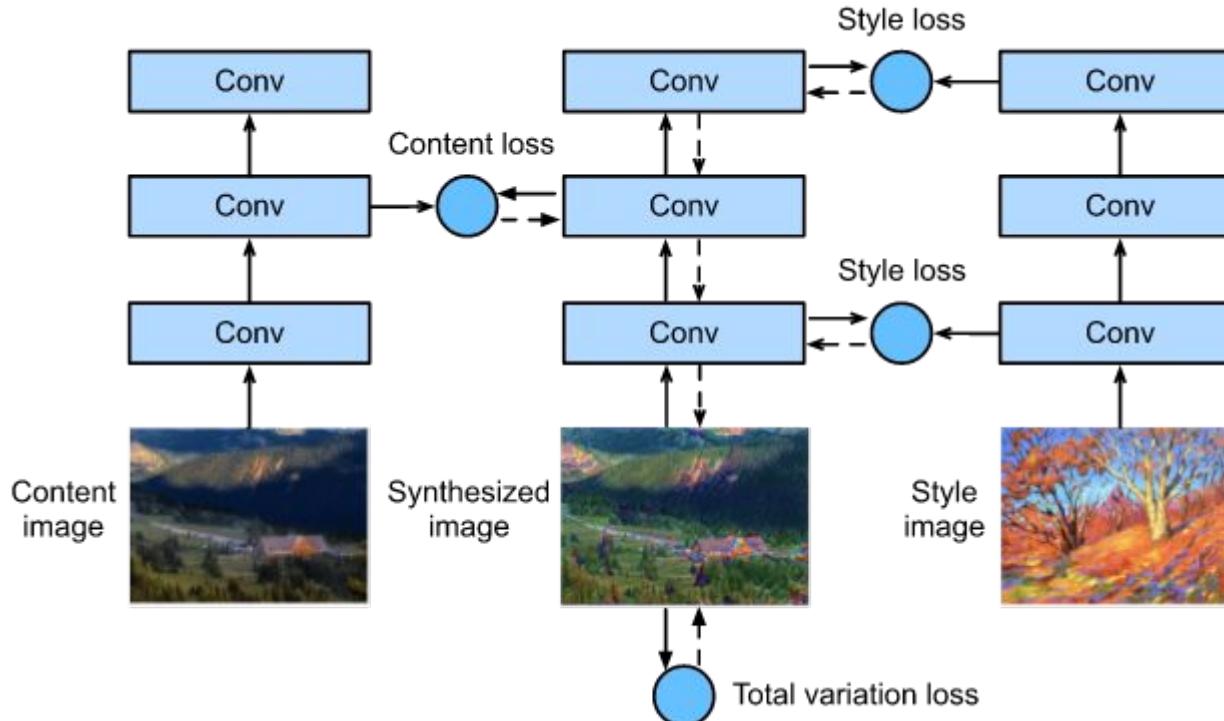


How does it work?

- In a traditional approach, we have inputs and targets, but rare to have pictures in multiple different styles
- Use a ML model to extract content and style features instead
 - Allows us to quantify style transferability without pairs

$$\mathcal{L}_{total}(\vec{p}, \vec{a}, \vec{x}) = \alpha \mathcal{L}_{content}(\vec{p}, \vec{x}) + \beta \mathcal{L}_{style}(\vec{a}, \vec{x})$$

Architecture of Style Transfer Models



Demo

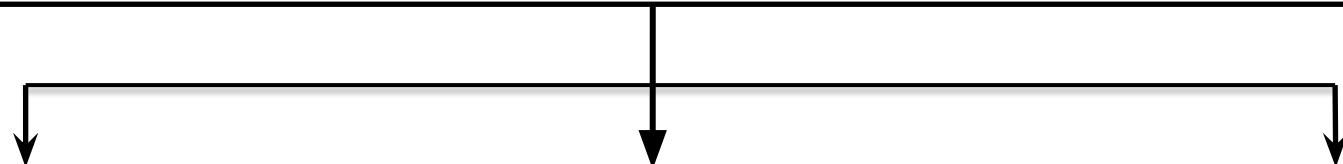
- Let's Animefy some images
 - Reminder: All of our code is publicly available online and you can run our code!
 - The code is hosted on colab, which runs on google servers and can be saved on the google drive

Style Transfer

Freely available online tools:

- waifu.lofiu.com
- huggingface.co/spaces/akhaliq/AnimeGANv2
- Animefilter.com
- <https://selfie2anime.com/>

Goal: Convince you all that we are cool, smart, and handsome.



Style Transfer

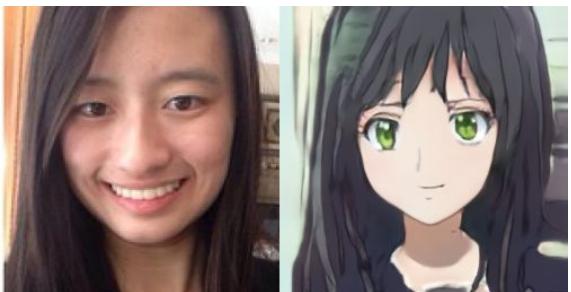


Image Coloring Manga/Art



Art Generation



The newest JoJo stand!

Auto-Coloring

Given a black-and-white sketch, color it in a reasonable manner, optionally with color information specified.



Original B&W Sketch



Random colorization



Purple hair, Cyan eyes

Problem

Merry is my waifu.



Problem

Merry is my waifu.
I am sad.



Problem

Merry is my waifu.

I am sad.

I do not know the color of her eyes.



Problem

Merry is my waifu.

I am sad.

I do not know the color of her eyes.

I do not know the color of her hair.



Problem

Merry is my waifu.

I am sad.

I do not know the color of her eyes.

I do not know the color of her hair.

Pickup line I cannot use:

I didn't know I liked [insert color] eyes,
until I saw yours.



Manga Artists Don't Care About Me):

Why isn't the manga colored?

What is the color of my waifu's hair!!!?

How soft is her hair!!@@??



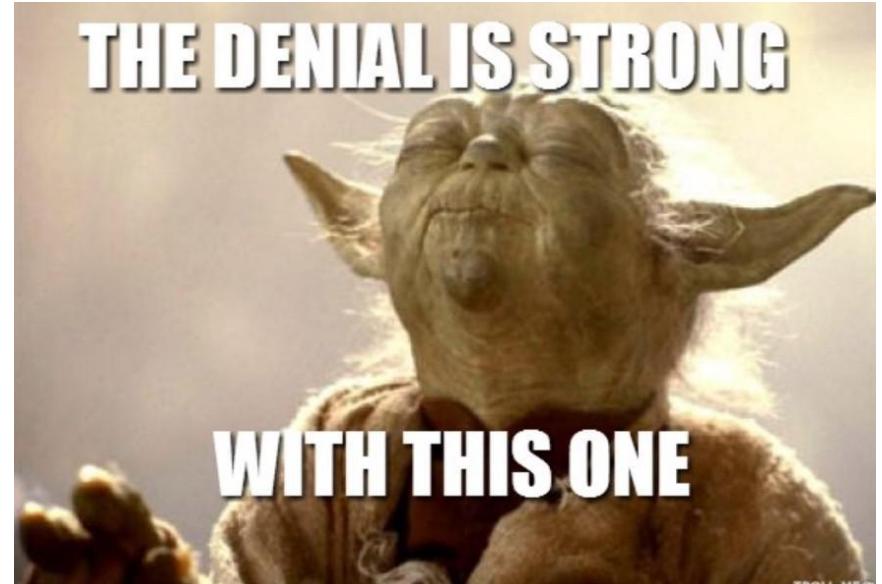
It Can't Be True

Why don't you give me the zip code of the state of denial you're living in, and I'll send you a postcard.



THE DENIAL IS STRONG

WITH THIS ONE



Manga Artists are Lazy

Sample Schedule of an Anonymous Weekly Manga Magazine Artist

Shiihashi Hiroshi

■某月某週の椎橋寛先生のスケジュール

M 月曜日	Tu 火曜日	W 水曜日	Th 木曜日	F 金曜日	Sa 土曜日	Su 日曜日
0:00 ネーム	ネーム直し	カバー(リスト執筆)	執筆	執筆	シナリオ(ネーム)	
1:00 ネーム	ネーム直し	カバー(リスト執筆)	執筆	執筆	シナリオ(ネーム)	
2:00 ネーム	ネーム直し	カバー(リスト執筆)	執筆	執筆	休憩	
3:00 ネーム	ネーム直し		休憩	執筆	執筆	休憩
4:00 ネーム	ネーム直し		休憩	執筆	執筆	休憩
5:00 ネーム	ネーム直し		休憩	休憩	執筆	休憩
6:00 朝食	担当さん打合せ		休憩	休憩	原稿アップ	
7:00 朝食	担当さん打合せ		休憩	休憩	休憩	休憩
8:00 朝食		休憩	休憩	休憩	休憩	休憩
9:00 ネーム		休憩	休憩	休憩	休憩	休憩
10:00 ネーム		朝食	朝食	朝食	朝食	朝食
11:00 ネーム	休憩	スタッフ入り/執筆	執筆	執筆	休憩	ネーム
12:00 ネーム	休憩		執筆	執筆	休憩	ネーム
13:00 ネーム	休憩		執筆	執筆	休憩	ネーム
14:00 ネーム	休憩		執筆	執筆	休憩	ネーム
15:00 ネーム	昼食		執筆	執筆	昼食	ネーム
16:00 ネーム	カラー(リスト)執筆		執筆	執筆	オフ	ネーム
17:00 ネーム	カラー(リスト)執筆		執筆	執筆	オフ	ネーム
18:00 ネーム	カラー(リスト)執筆		執筆	執筆	オフ	ネーム
19:00 担当さん打合せ	カラー(リスト)執筆	夕食	夕食	夕食	担当さん原稿渡し	ネーム
20:00 担当さん打合せ	カラー(リスト)執筆		執筆	執筆	ネーム打合せ	ネーム
21:00 ネーム直し	夕食		執筆	執筆	ネーム打合せ	ネーム
22:00 ネーム直し	カラー(リスト)執筆		執筆	執筆	シナリオ(ネーム)	ネーム
23:00 ネーム直し	カラー(リスト)執筆		執筆	執筆	シナリオ(ネーム)	ネーム

ネーム Working on thumbnails, rough pages called "Nemu"

朝食 Meal break

休憩 Sleeping

担当さん打合せ Meeting with his Editor

カラー(リスト)執筆 Working on the cover or color pages

執筆 Time that the assistants are helping

オフ Free time not spent working on the comic
(...three hours on Saturday)

-126 Hours Per Week

~130 Hours Per Week with modern coloring technologies



Korean
Manhwas
Exclusively
have Color

창성학(创性学) 만화

총금·전기 기소령 각색

Solution



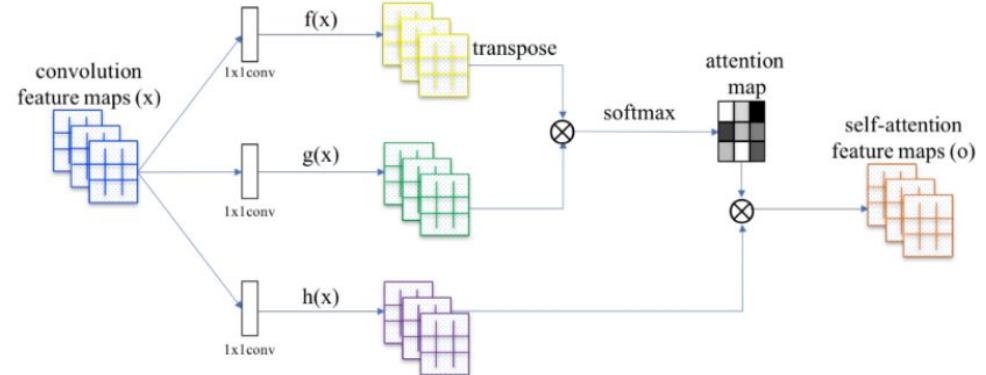
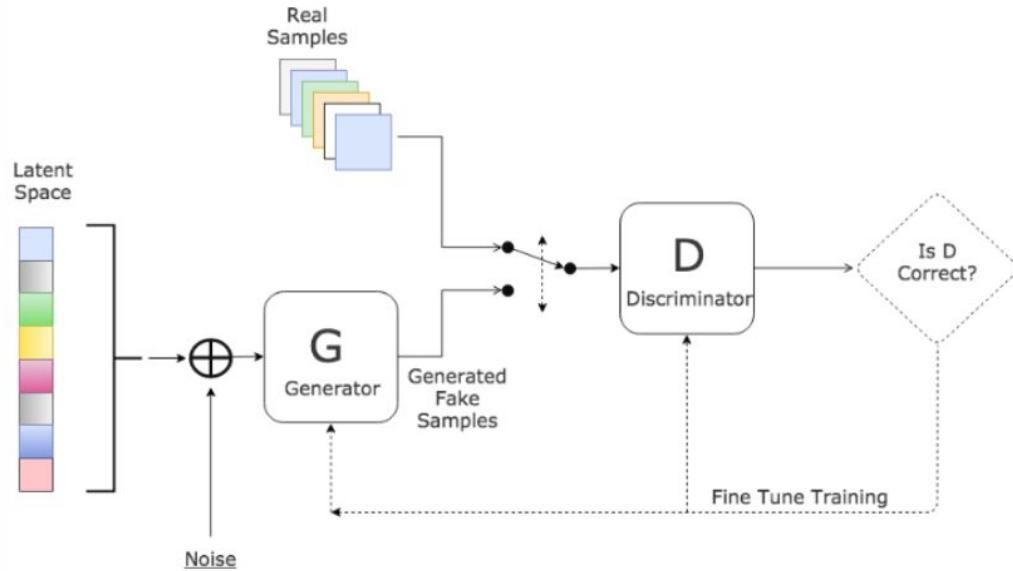
Use Generative Adversarial Networks (GANs) to learn contextualized colors.

Original intent was to add color to historical records.

<https://github.com/jantic/DeOldify>

How does it Work?

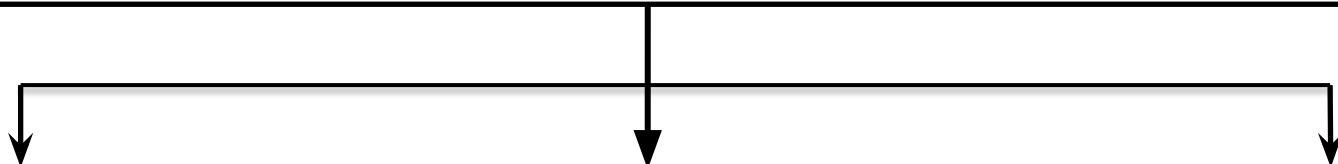
Generative Adversarial Network



Demo

Let's come closer to the affection
of our waifus together!

Goal: Convince you all that we are cool, smart, and handsome.



Style Transfer

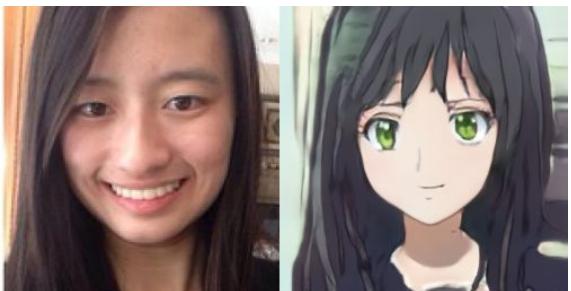


Image Coloring Manga/Art



Art Generation



The newest JoJo stand!

Character Generation

Generate a drawing of an anime character, either completely randomly or with some details defined.



Random



Random



Pink eyes, Blue hair



Long hair, Glasses, No smile

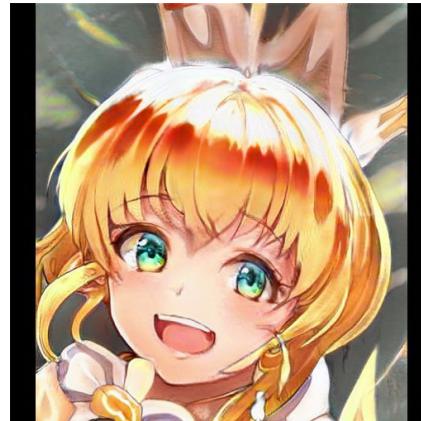
Character Generation

Freely available tools:

- thisanimedoesnotexist.ai
- make.girls.moe
- waifulabs.com
- www.thiswaifudoesnotexist.net

History

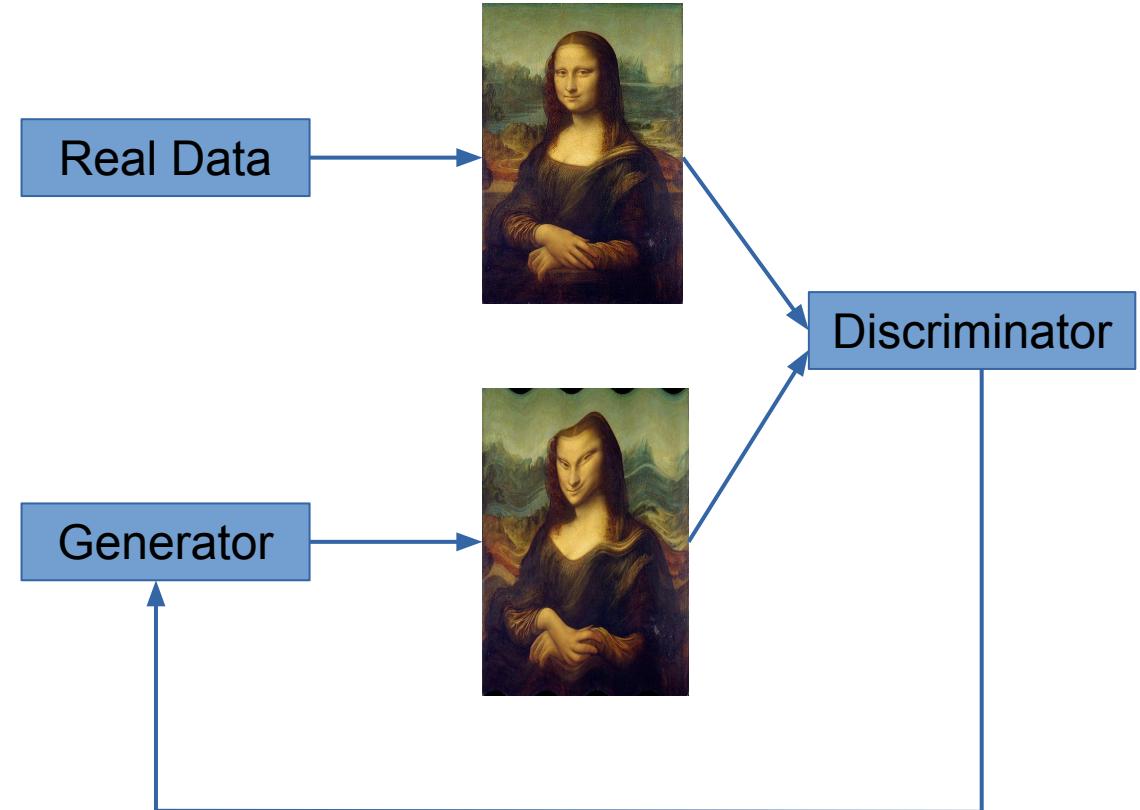
- StyleGAN was made available Feb 2019
- StyleGAN2 was made available Feb 2020



Images Generated by StyleGAN2

Technical Details - GANs

- Discriminator vs. Generator
- Detective vs. Forger
- Eventually, generator learns to fool the discriminator, and has (hopefully) learned the distribution.



History

- Issue with GANs/VAEs
 - Limited ability to specify attributes (latent tags)
- Diffusion Models are much easier to direct

History

- Stable Diffusion was made available 22 Aug 2022
- Waifu Diffusion v1.3 weights were made available 6 Oct 2022



1girl, blue hair, green cap, long hair, pink eyes



1boy, silver hair, red eyes, earrings

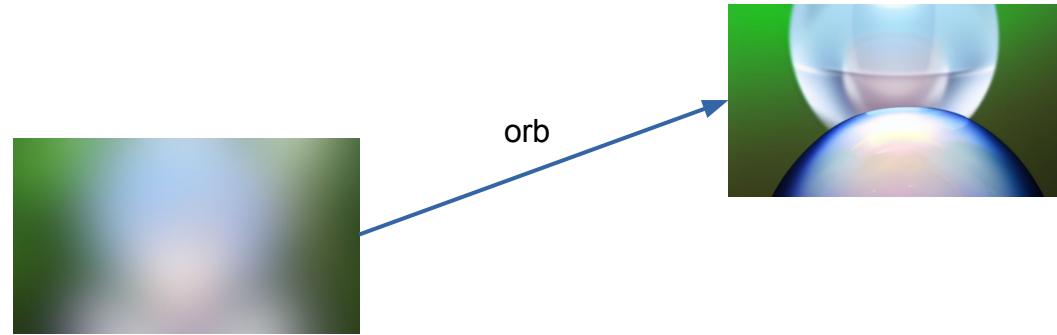
Technical Details – Diffusion Models

- Undoes diffusion
- Key idea: everything looks the same if sufficiently blurred
- Begin with random noise, then progressively deblur it with help from the prompt



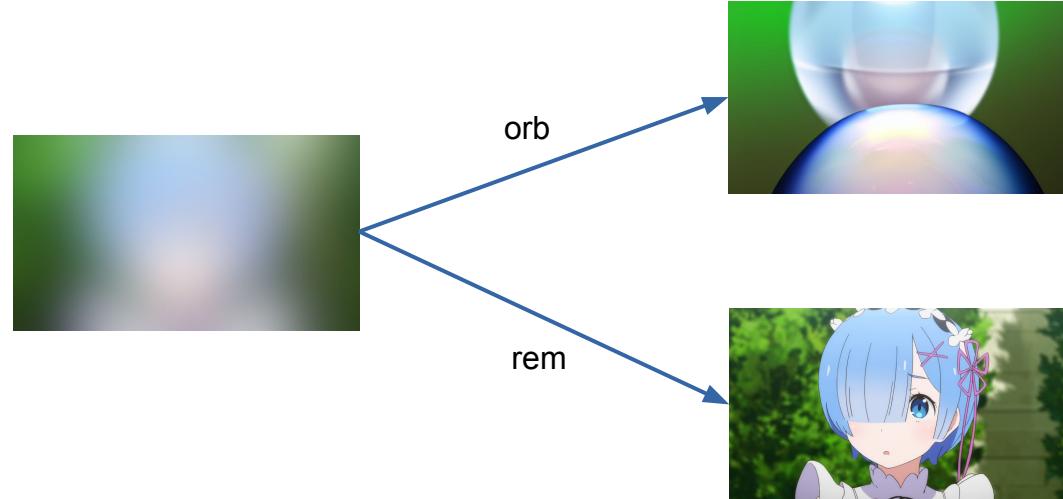
Technical Details – Diffusion Models

- Undoes diffusion
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- Begin with random noise, then progressively deblur it with help from the prompt



Technical Details – Diffusion Models

- Undoes diffusion
- Key idea: everything looks the same if sufficiently blurred
- Begin with random noise, then progressively deblur it with help from the prompt



Diffusion Models - Examples



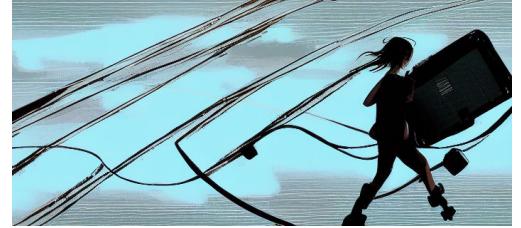
Girl with mint ice cream cone



A jojo-stand doing kung fu



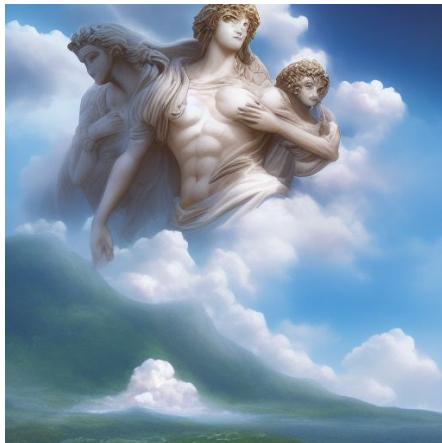
A witch in b/w



Silhouette of a girl stealing a TV



A large fire monster



Greek gods in clouds



A man on a whale in the sky

Demo

You submitted requests, here they are!

Thank you all for listening!

Code at:

github.com/kkokilep/Cant-Spell-Anime-Without-AI

Contact us:

maxxu@gatech.edu