Stable Diffusion

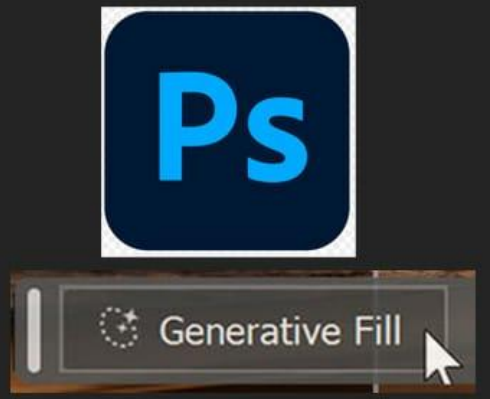
Hugo Guillen

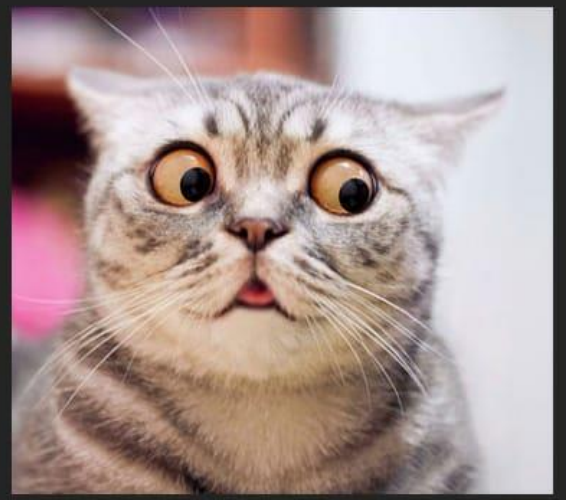
@voidvoidx

Then

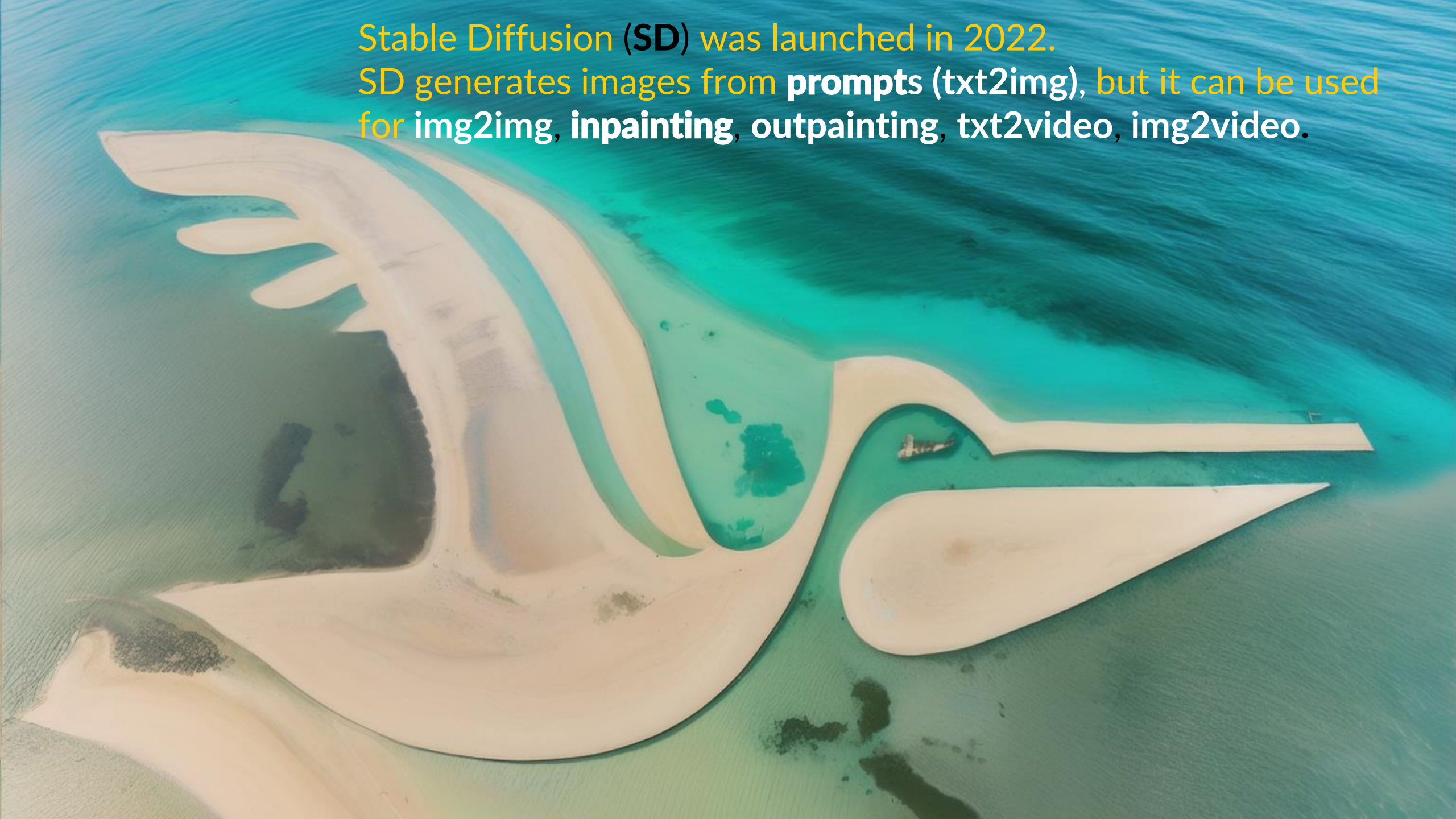
Ban AI - Save Artists

Now

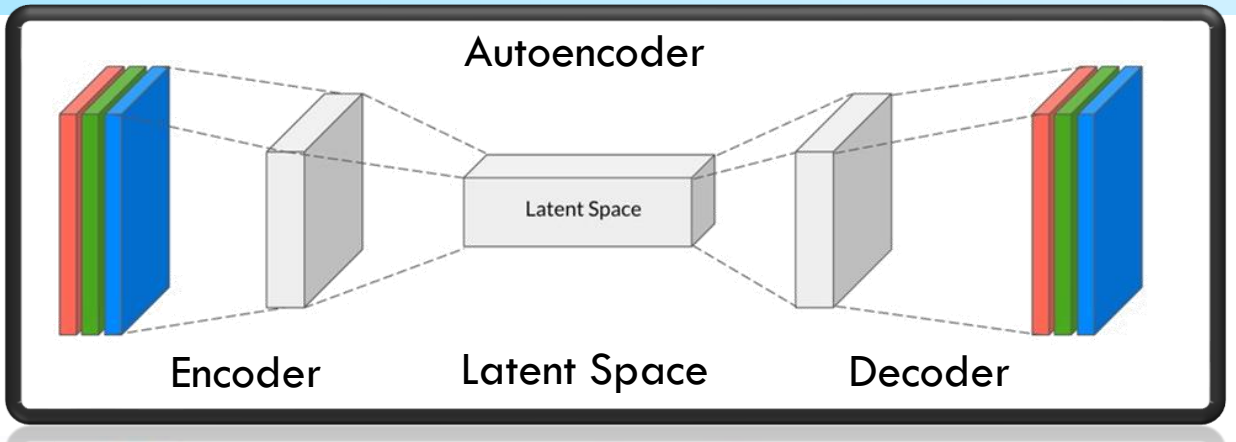


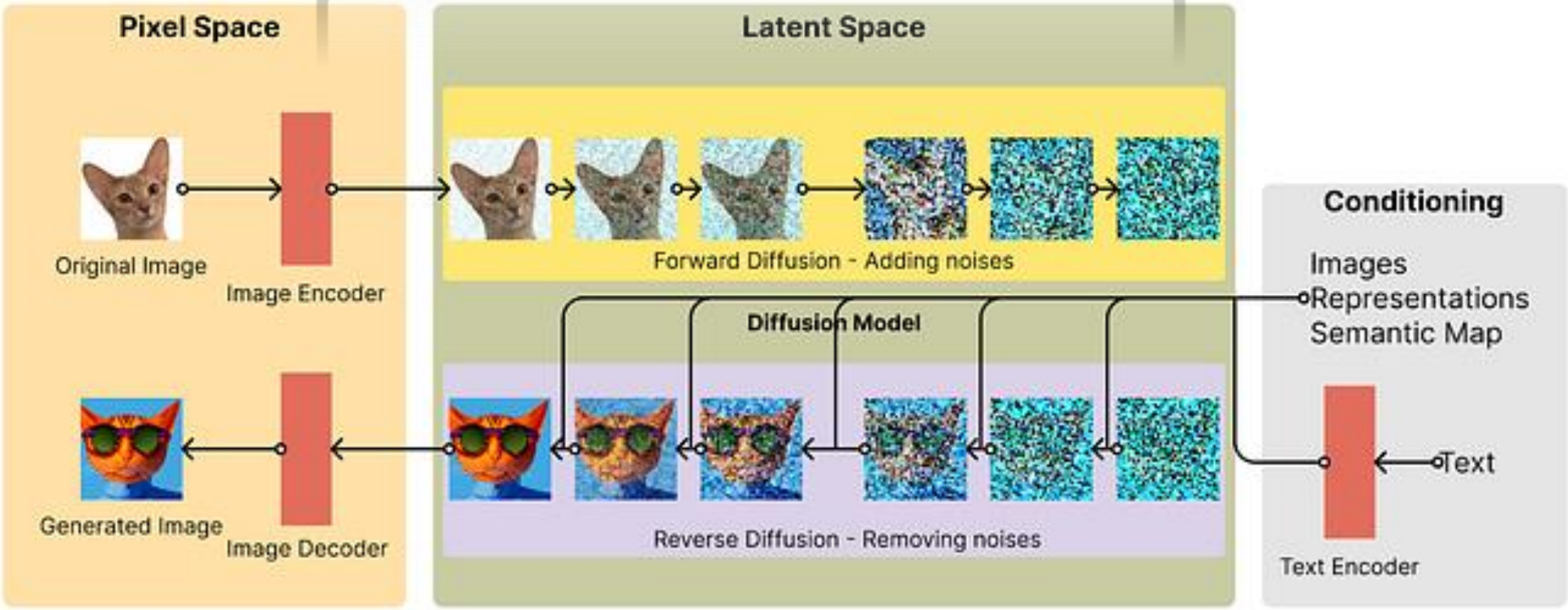


it's so convenient


Stable Diffusion (SD) was launched in 2022.
SD generates images from prompts (txt2img), but it can be used for img2img, inpainting, outpainting, txt2video, img2video.

Stable Diffusion Architecture

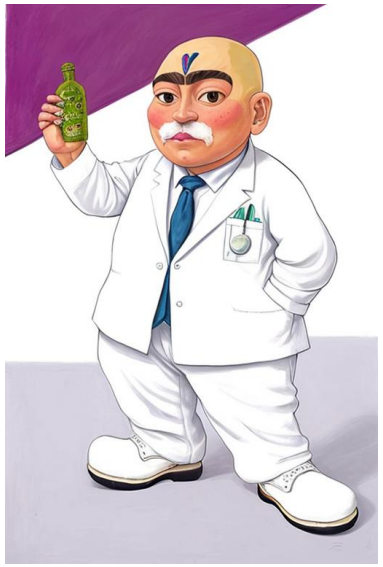




img2img

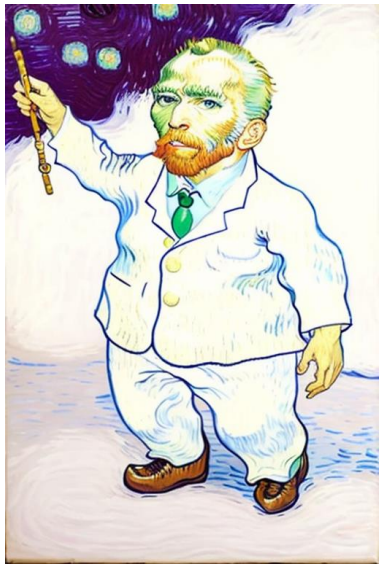
Original

a painting of a chubby old bald doctor on a white coat, white shoes, white moustache, blue tie, (style of **X**:1.3)



Frida Kahlo

Diego Rivera

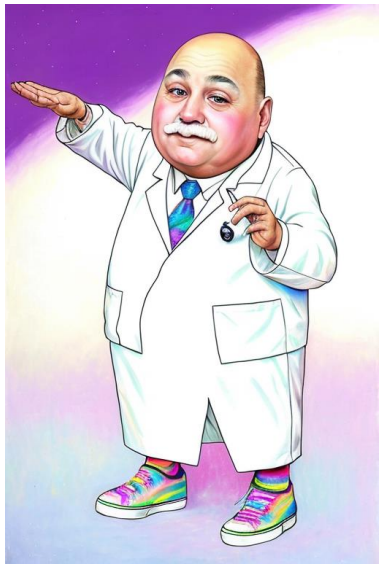


Van Gogh

Botero

Romero Britto

Akira Toriyama



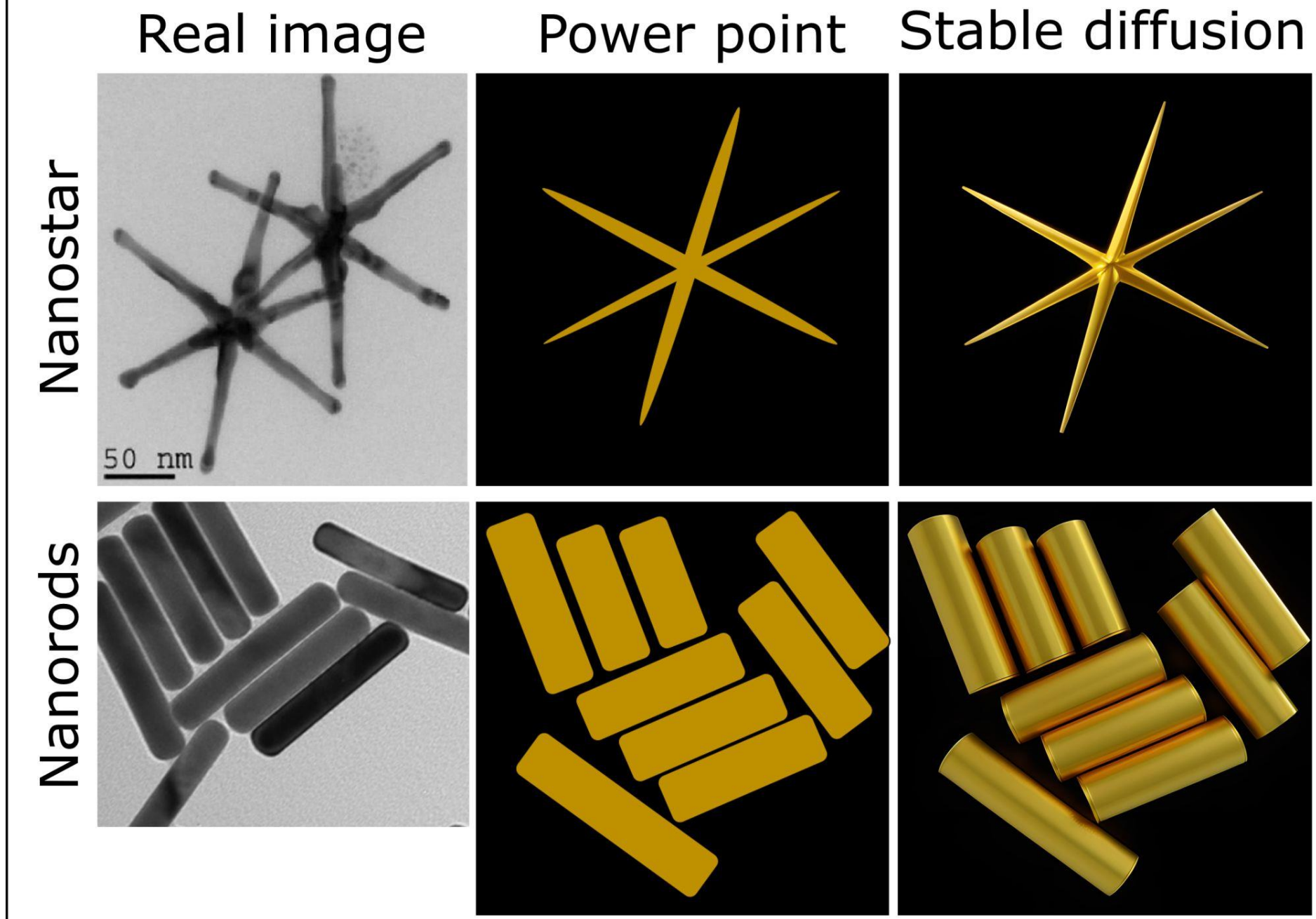
Lisa Frank

revAnimated

img2img (2)

Leonhard Euler

Ada Lovelace


Real image
Power point
Stable diffusion
Nanostar
Nanorods
50 nm

Inpainting

'Girl with a Pearl Earring'

'Girl with a Red Hair'

Outpainting

Outpainting (2)

kenneth cassel @KennethCassel · 26 ago. 2022

How much did it cost to train Stable Diffusion?

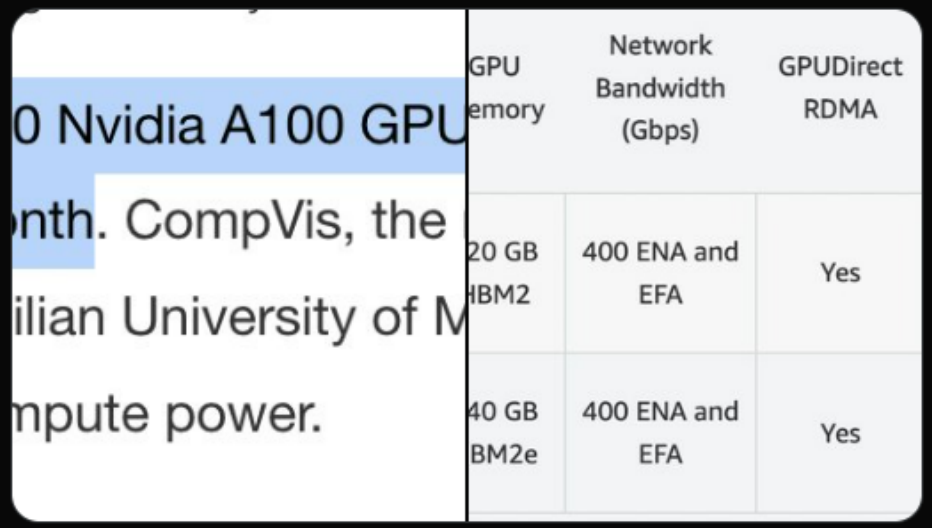
here's a guess

"Stability AI used a cluster of 4,000 Nvidia A100 GPUs running in AWS to train Stable Diffusion over the course of a month"

$32.77/hr for 8 GPUs
$16,384/hr for 4000 GPUs

720 hours in a month

$11.7M



0 Nvidia A100 GPU nth. CompVis, the ilian University of M mpute power.	GPU emory	Network Bandwidth (Gbps)	GPUDirect RDMA
	20 GB HBM2	400 ENA and EFA	Yes
	40 GB BM2e	400 ENA and EFA	Yes

7 41 333

Emad @EMostaque

We actually used 256 A100s for this per the model card, 150k hours in total so at market price $600k

Traducir Tweet

2:46 p. m. · 28 ago. 2022

MosaicML @MosaicML

How much does it take to train a Stable Diffusion model from scratch? The answer: 79,000 A100-hours in 13 days, for a total training cost of <$160k. Our tooling reduces the time and cost to train by 2.5x, and is also extensible and simple to use.

Traducir Tweet

mosaicml.com
Training Stable Diffusion from Scratch Costs <$160k
We wanted to know how much time (and money) it would cost to train a Stable Diffusion model from scratch using our Streaming datasets, Composer, and ...

6:56 p. m. · 24 ene. 2023 · **66,1 mil** Reproducciones

LORA

arXiv > cs > arXiv:2106.09685

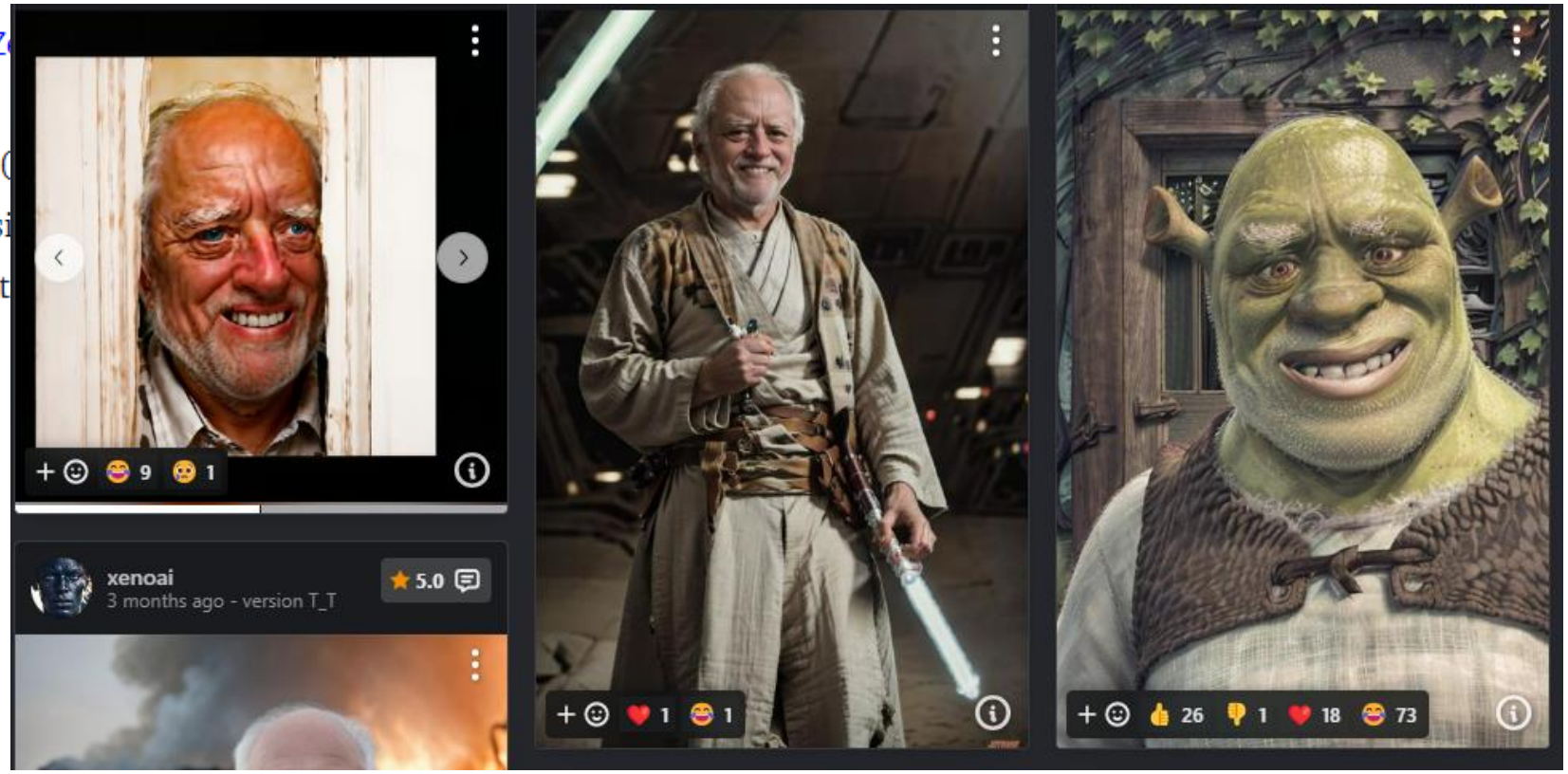
Computer Science > Computation and Language

[Submitted on 17 Jun 2021 (v1), last revised 16 Oct 2021 (this version, v2)]

LoRA: Low-Rank Adaptation of Large Language Models

Edward J. Hu, Yelong Shen, Phillip Wallis, Z
Weizhu Chen

To the best of our knowledge, Simo Ryu (
implementation adapted to Stable Diffusi
lots of interesting discussions and insight



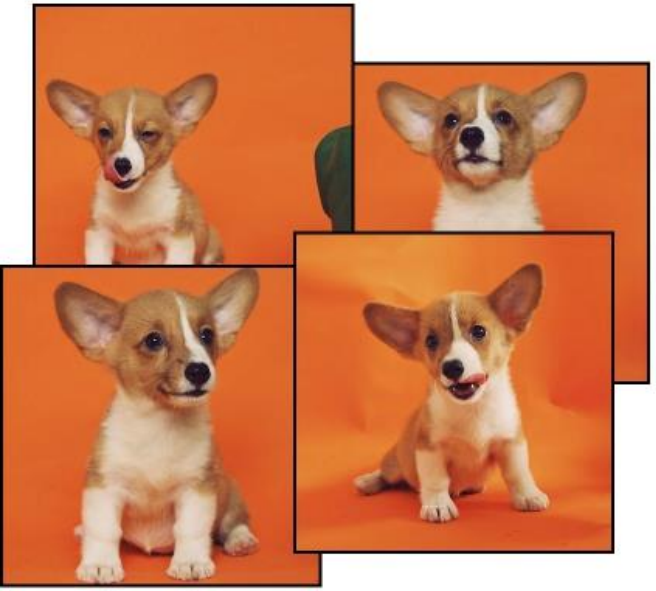
https://huggingface.co/blog/lora
https://github.com/cloneofsimo/lora

DreamBooth

DreamBooth

Open in Colab | Open Studio Lab

DreamBooth is a method to personalize text-to-image models like Stable Diffusion given just a few (3-5) images of a subject. It allows the model to generate contextualized images of the subject in different scenes, poses, and views.



Input images

in the Acropolis

swimming

sleeping

in a doghouse

in a bucket

getting a haircut

https://huggingface.co/docs/diffusers/training/dreambooth

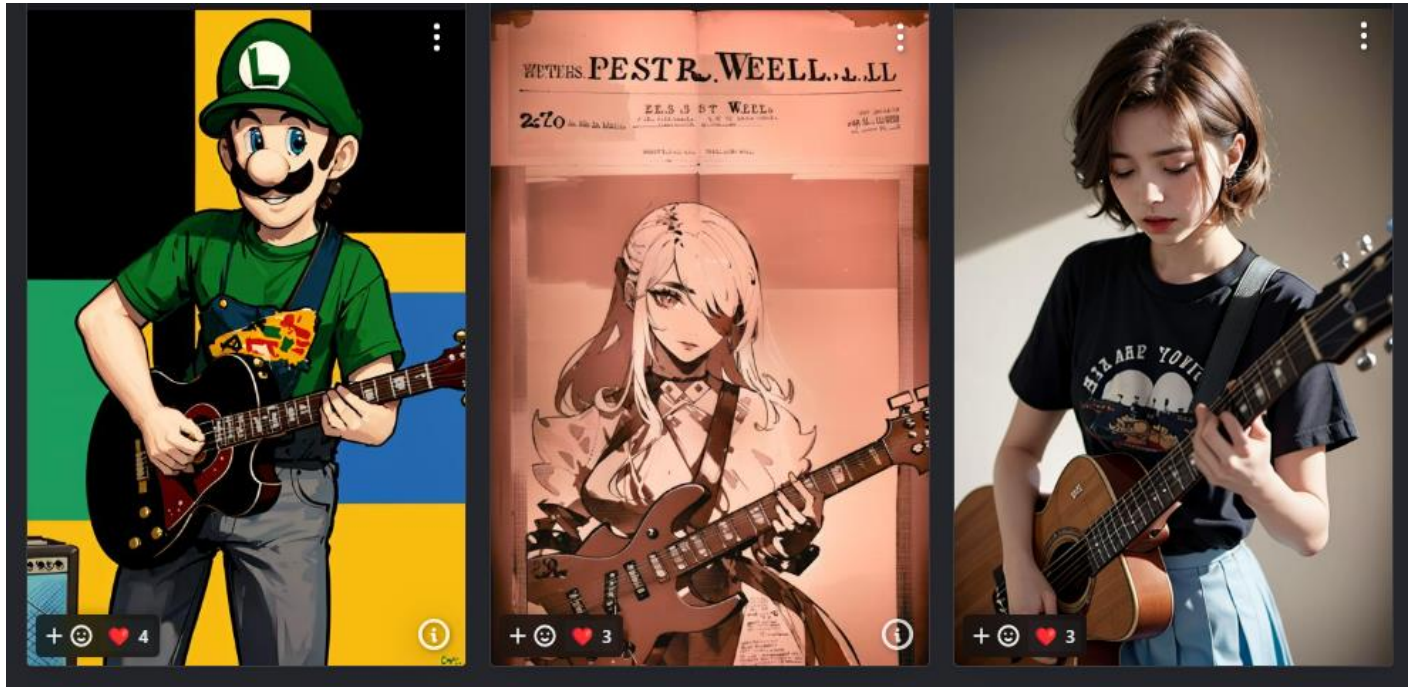
LyCORIS

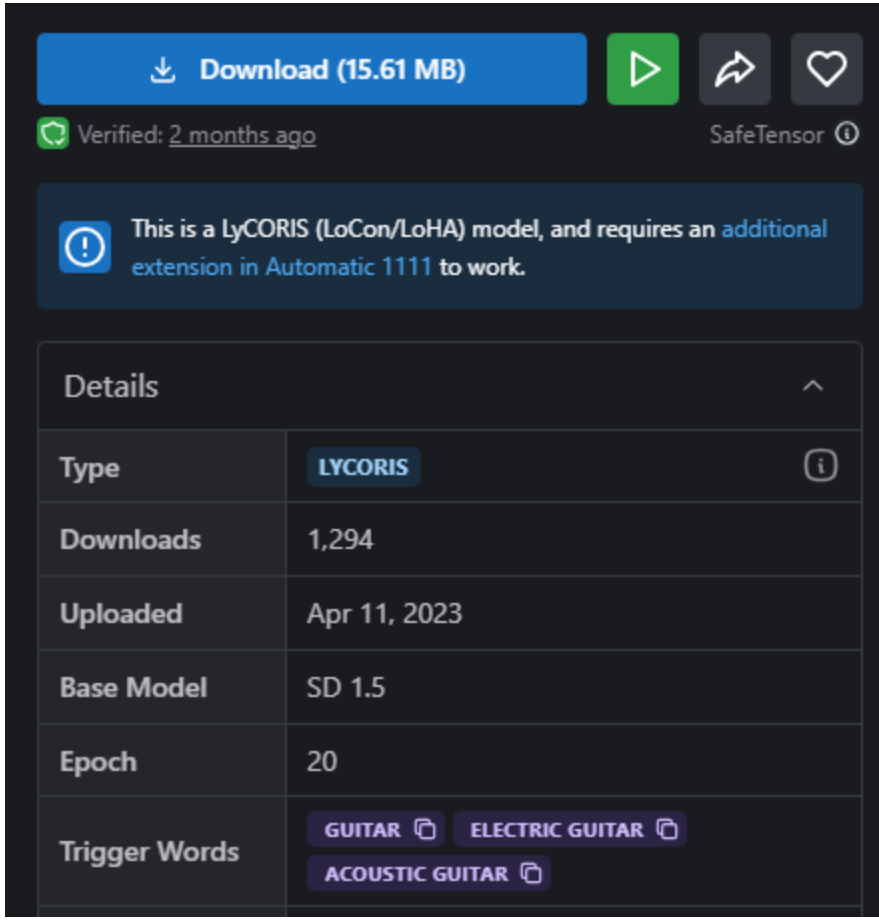
LyCORIS (**L**ora be**Y**ond **C**onventional methods, **O**ther **R**ank adaptation **I**mplementations for **S**table Diffusion) model is an **alternative method for implementing different algorithm to do parameter-efficient fine-tuning on Stable Diffusion.**

LyCORIS started from LoCon and LoHa and can easily be mixed with LoRA. However, there are a few things that differentiate LyCORIS and LoRAs. LoRA files are, on average, 180MB in size, whereas LyCORIS files are 40-60MB in size. LyCORIS uses the *.safetensor file type.

LyCORIS uses convolutional layers instead of text encoder for image learning.

- LoCon is a LoRA that uses convolutional layers.
- LoHa is a more efficient LoRA.





GUI

Training/Inference

AUTOMATIC1111

Stable Diffusion web UI

GRADIO

Hugging Face

aws

Google Colaboratory

patreon

Ko-fi

Funding

CIVITAI

Models repositories

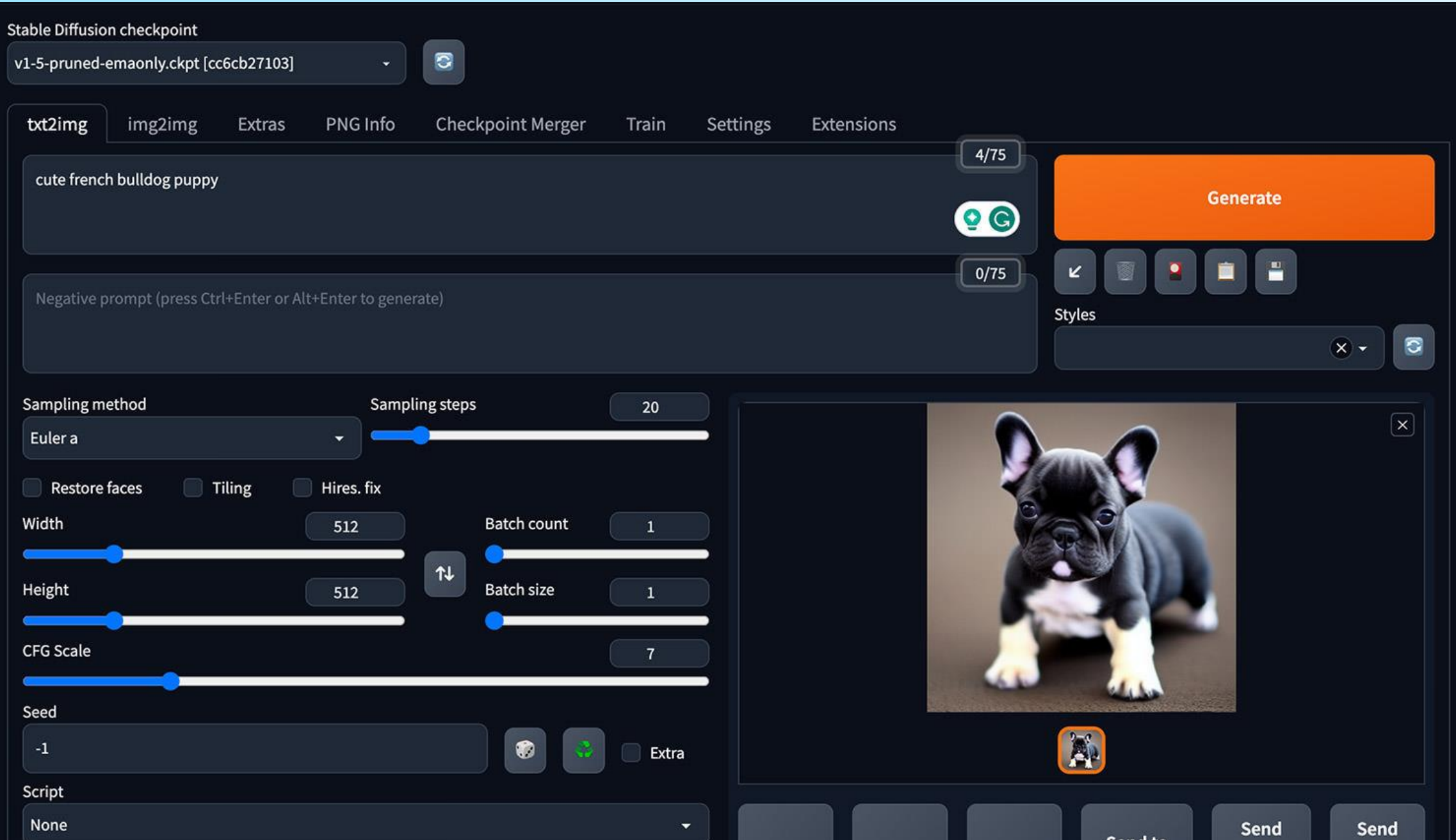
DISCORD

reddit

arXiv

Communities

Automatic1111



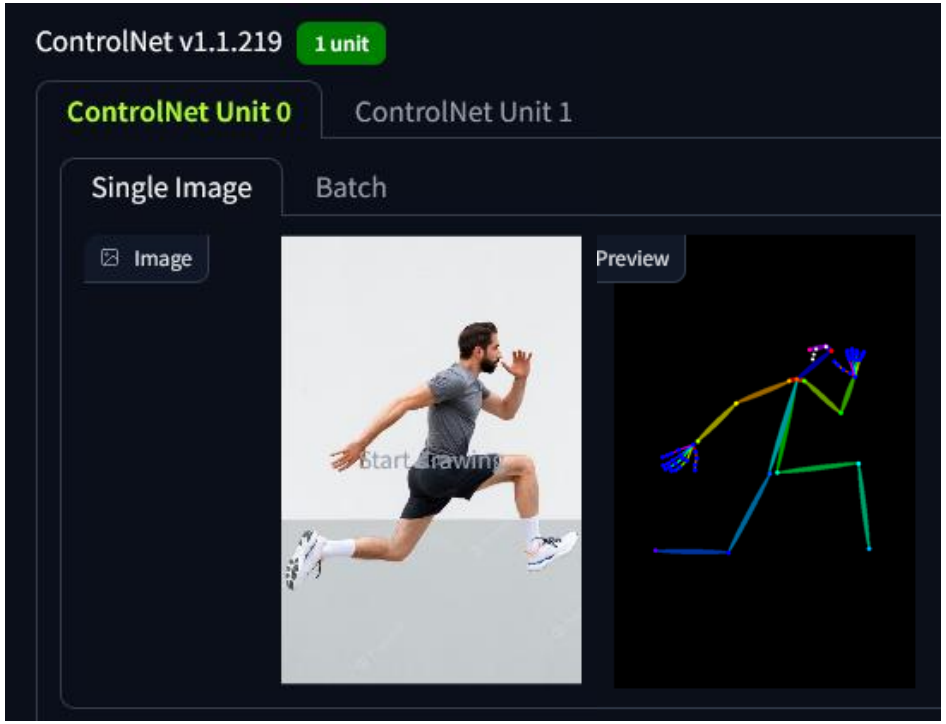
Installed | Available | Install from URL | Backup/Restore

Apply and restart UI | Check for updates

Disable all extensions: none | extra | all

Extension	URL	Branch	Version	Date	Update
☐ OneButtonPrompt	https://github.com/AIrjen/OneButtonPrompt	main	7e038eee	Mon May 29 05:46:52 2023	unknown
☑ Stable-Diffusion-Webui-Civitai-Helper	https://github.com/butaixianran/Stable-Diffusion-Webui-Civitai-Helper.git	main	920ca326	Tue May 23 11:53:22 2023	unknown
☑ a1111-sd-webui-lycoris	https://github.com/KohakuBlueleaf/a1111-sd-webui-lycoris	main	e4754888	Tue Jun 6 02:12:14 2023	unknown
☑ adetailer	https://github.com/Bing-su/adetailer.git	main	76424252	Mon Jun 5 05:32:16 2023	unknown
☑ canvas-zoom	https://github.com/richrobber2/canvas-zoom.git	main	4599938f	Tue Jun 6 22:50:48 2023	unknown
☑ clip-interrogator-ext	https://github.com/pharmapsychotic/clip-interrogator-ext.git	main	9e6bbd9b	Tue Mar 28 03:20:44 2023	unknown
☑ ddetailer	https://github.com/dustysys/ddetailer.git	master	22a17414	Mon Nov 28 09:33:31 2022	unknown
☑ multidiffusion-upscaler-for-automatic1111	https://github.com/pkuliyi2015/multidiffusion-upscaler-for-automatic1111	main	70b3c5ea	Sun May 28 09:11:28 2023	unknown
☑ openOutpaint-webUI-extension	https://github.com/zero01101/openOutpaint-webUI-extension	main	5e84d6d5	Mon Apr 10 23:01:41 2023	unknown
☐ sd-canvas-editor	https://github.com/jtydhr88/sd-canvas-editor.git	master	9849a08c	Fri May 5 02:16:38 2023	unknown
☑ sd-model-organizer	https://github.com/alexandersokol/sd-model-organizer.git	main	652580de	Mon May 8 11:00:16 2023	unknown
☑ sd-model-preview-xd	https://github.com/CurtisDS/sd-model-preview-xd	main	3ed39cd0	Tue May 23 00:52:25 2023	unknown
☑ sd-pixel	https://github.com/Leodotpy/sd-pixel.git	master	ceb493db	Wed May 31 19:57:01 2023	unknown
☑ sd-webui-controlnet	https://github.com/Mikubill/sd-webui-controlnet.git	main	99408b9f	Wed Jun 7 02:04:53 2023	unknown
☑ sd-webui-faceswap	https://github.com/Ynn/sd-webui-faceswap	main	ced7c344	Sat Jun 10 15:56:55 2023	unknown
☑ sd-webui-llul	https://github.com/hnmr293/sd-webui-llul.git	master	aa47b3ee	Thu May 4 16:14:34 2023	unknown
☑ sd-webui-lora-block-weight	https://github.com/hako-mikan/sd-webui-lora-block-weight.git	main	19a5dd07	Wed May 31 17:11:13 2023	unknown
☑ stable-diffusion-webui-eyemask	https://github.com/ilian6806/stable-diffusion-webui-eyemask.git	master	7b803a43	Fri Jun 2 11:15:19 2023	unknown
☑ stable-diffusion-webui-rembg	https://github.com/AUTOMATIC1111/stable-diffusion-webui-rembg.git	master	3d9eedbb	Sun Jun 4 13:35:24 2023	unknown
☑ stable-diffusion-webui-text2prompt	https://github.com/toshiaki1729/stable-diffusion-webui-text2prompt.git	main	c4d8cec1	Fri Feb 24 08:29:55 2023	unknown

ControlNet v1.1.219
2 units
ControlNet Unit 0
ControlNet Unit 1
ControlNet
Single Image
Batch
Image
Start drawing


ControlNet v1.1.219
1 unit
ControlNet Unit 0
ControlNet Unit 1
Single Image
Batch
Image
Preview

txt2img

anime style, full body shot 1girl, (white visor:1.3), slightly ripped jeans (pants:1.2), black crop top, denim jacket, shades on head, long blue hair, blue eyes, black skater shoes, tokyo city street background

Negative prompt: (((wings))), badhandv4, EasyNegative, negative_hand-neg, missing feet, missing leg

Model: mechanicmixV2_mechanicmixV2,
ControlNet 0: "preprocessor: reference_adain+attn
ControlNet 1: "preprocessor: depth_midas, model: control_depth-fp16 [400750f6]

OC

Pose

“Automatic” reference

https://twitter.com/danny_rg2000