AI ART - LESSON 2 - MAR 9, 2023

BASIC TOOLS FOR CREATING AI ART

Benjamin Meadows | @TheBenMeadows

“Page 339” by Claire Silver

WHY AM I HERE?

- Goals
  - Review how DALL-E 2, Midjourney & Stable Diffusion create images.
  - Discuss how they are similar and how they differ.
  - Dive into how to access and use each tool.
  - Look at some of the newest developments with each tool.

WHAT'S NEXT?

- ~~Lesson 1 - Introduction to AI Art~~
- **Lesson 2 - Basic Tools for Creating AI Art**
- Lesson 3 - Tools & Workflows for AI Art (Part 1)
- Lesson 4 - Tools & Workflows for AI Art (Part 2)
- Lesson 5 - Getting Familiar with GAN
- Lesson 6 - How to Create Basic Generative Art

TEXT-TO-IMAGE MODELS & DIFFUSION

HISTORY OF AI ART - REVIEW

- 2022
  - March - Midjourney private beta.
  - April - DALL-E 2 beta (no commercial rights).
  - July - DALL-E 2 includes commercial rights.
  - July - Stable Diffusion private beta.
  - August - SD 1.4 model is “open-sourced.”

DALL-E 2 - WHAT IS IT?

https://openai.com/product/dall-e-2

OpenAI

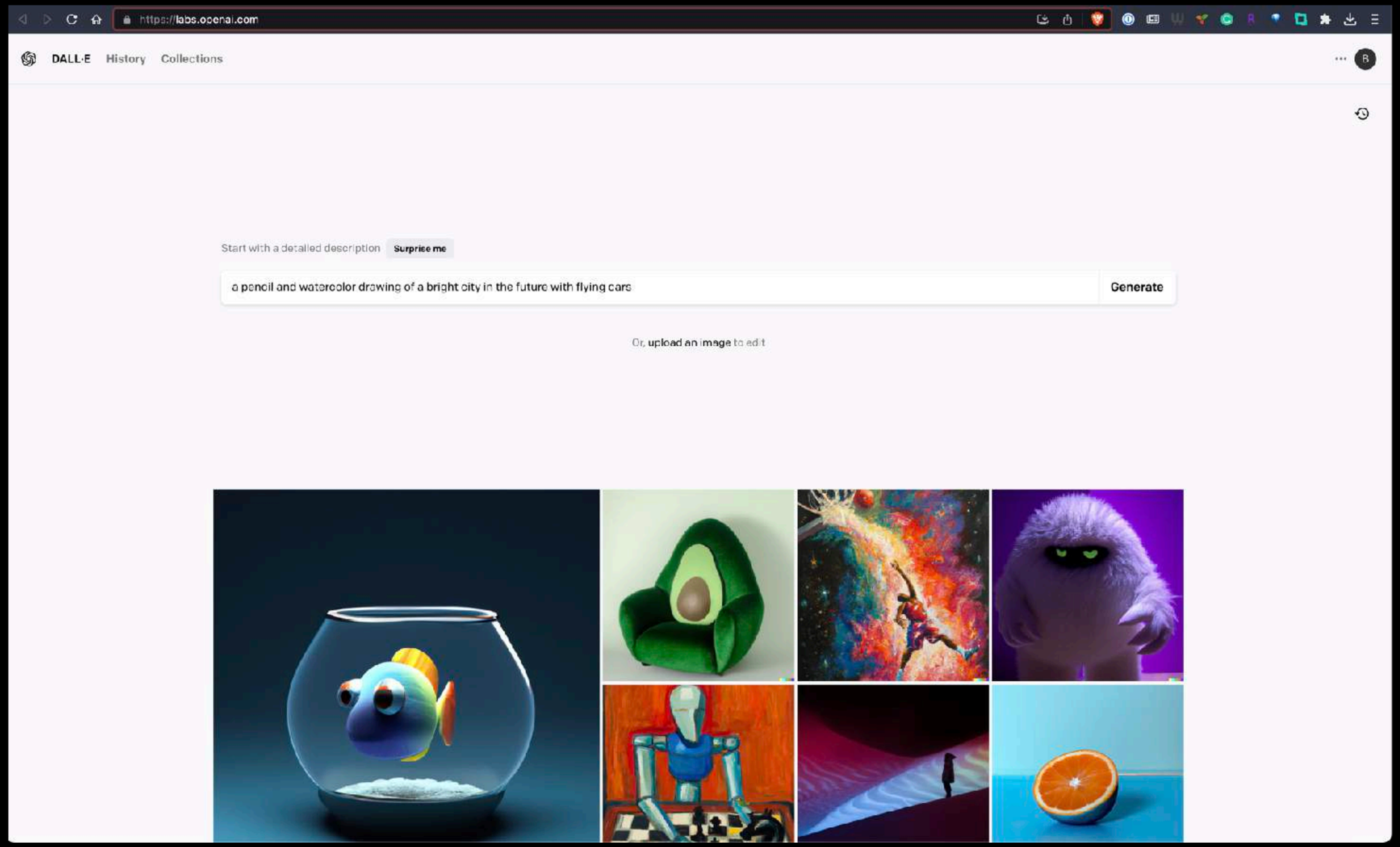
Research Product Safety Company

DALL·E 2

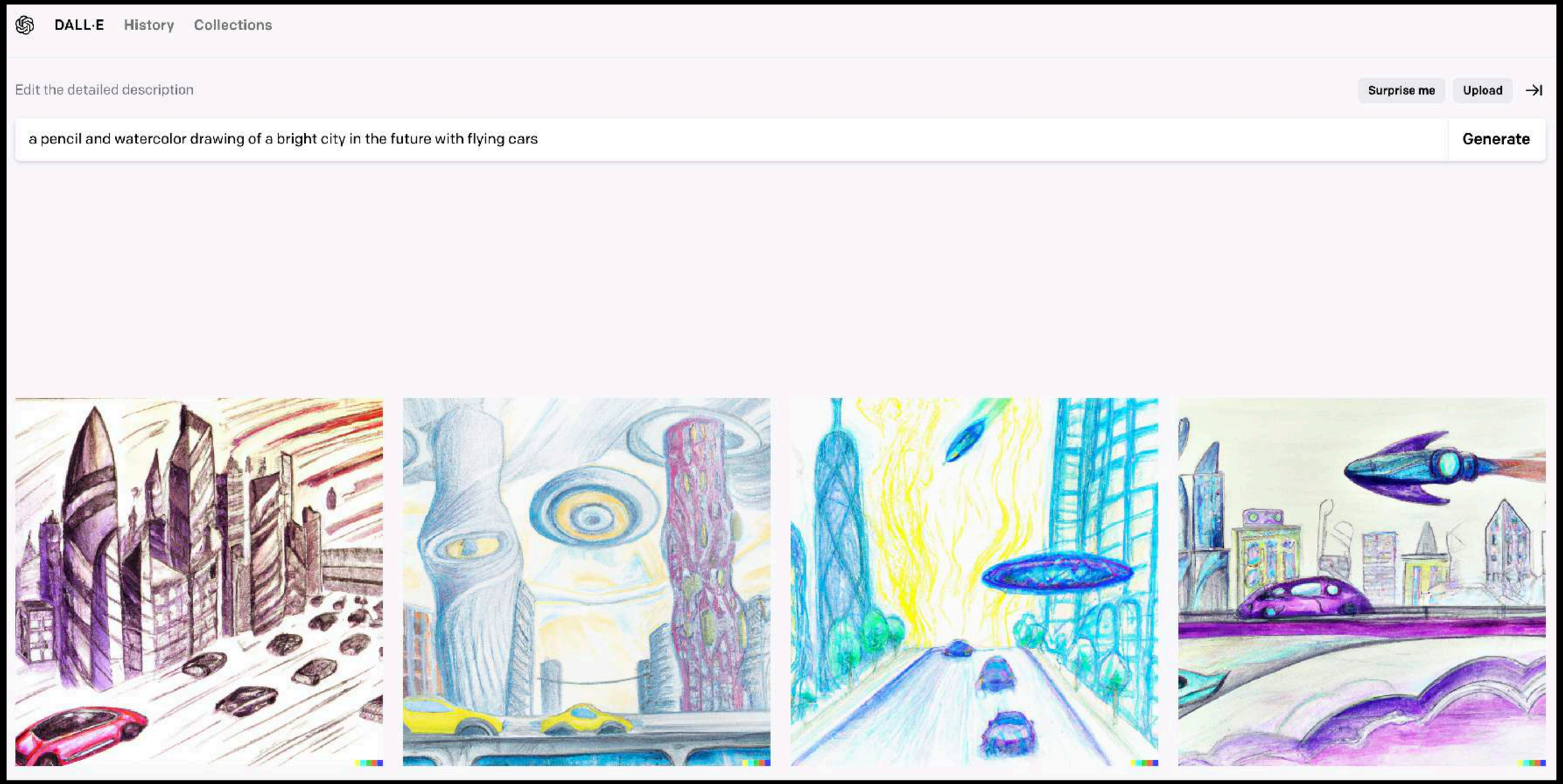
DALL·E 2 is an AI system that can create realistic images and art from a description in natural language.

Try DALL·E ↗ Follow on Instagram ↗

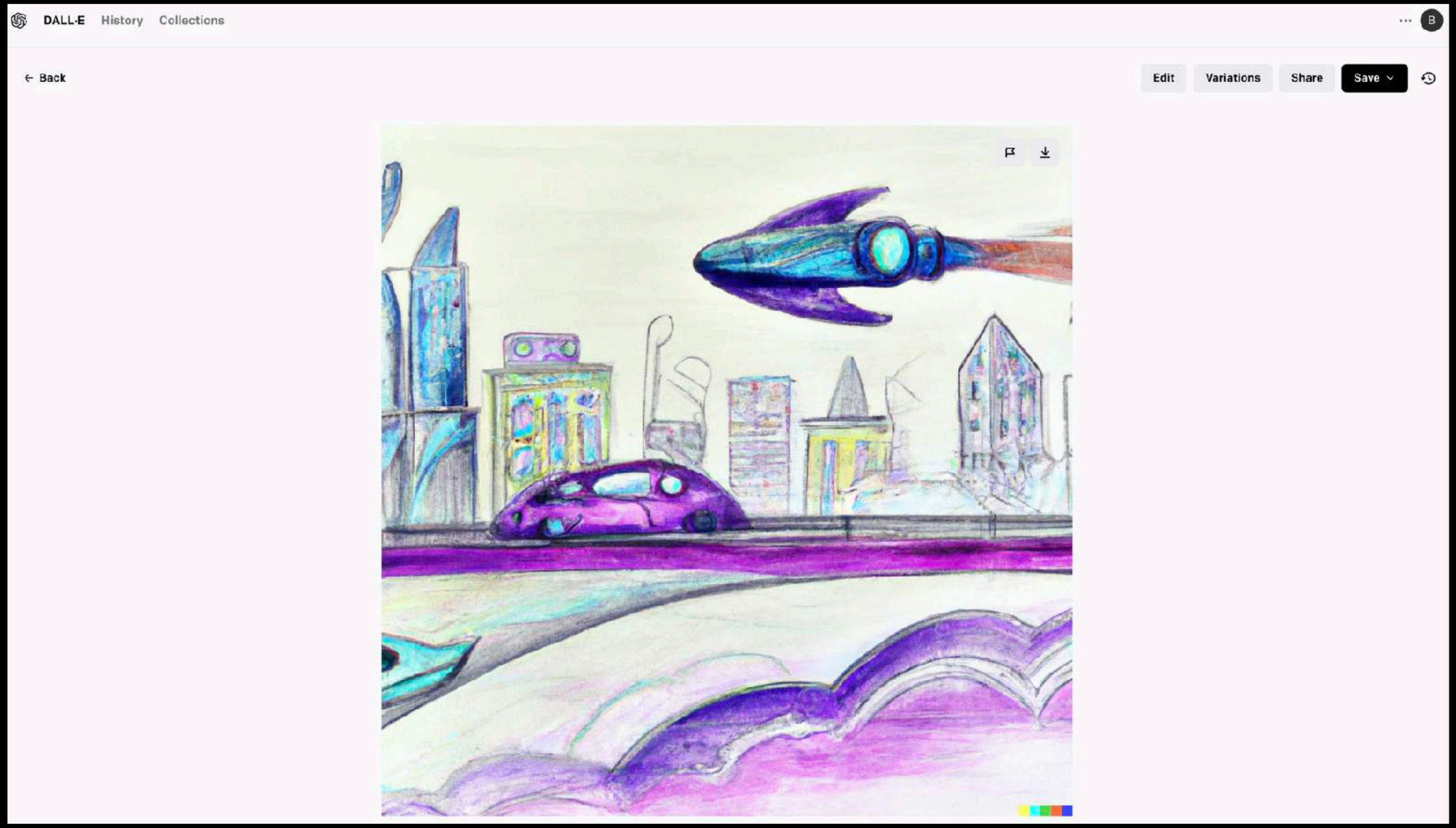
DALL-E 2 - HOW DO YOU USE IT?



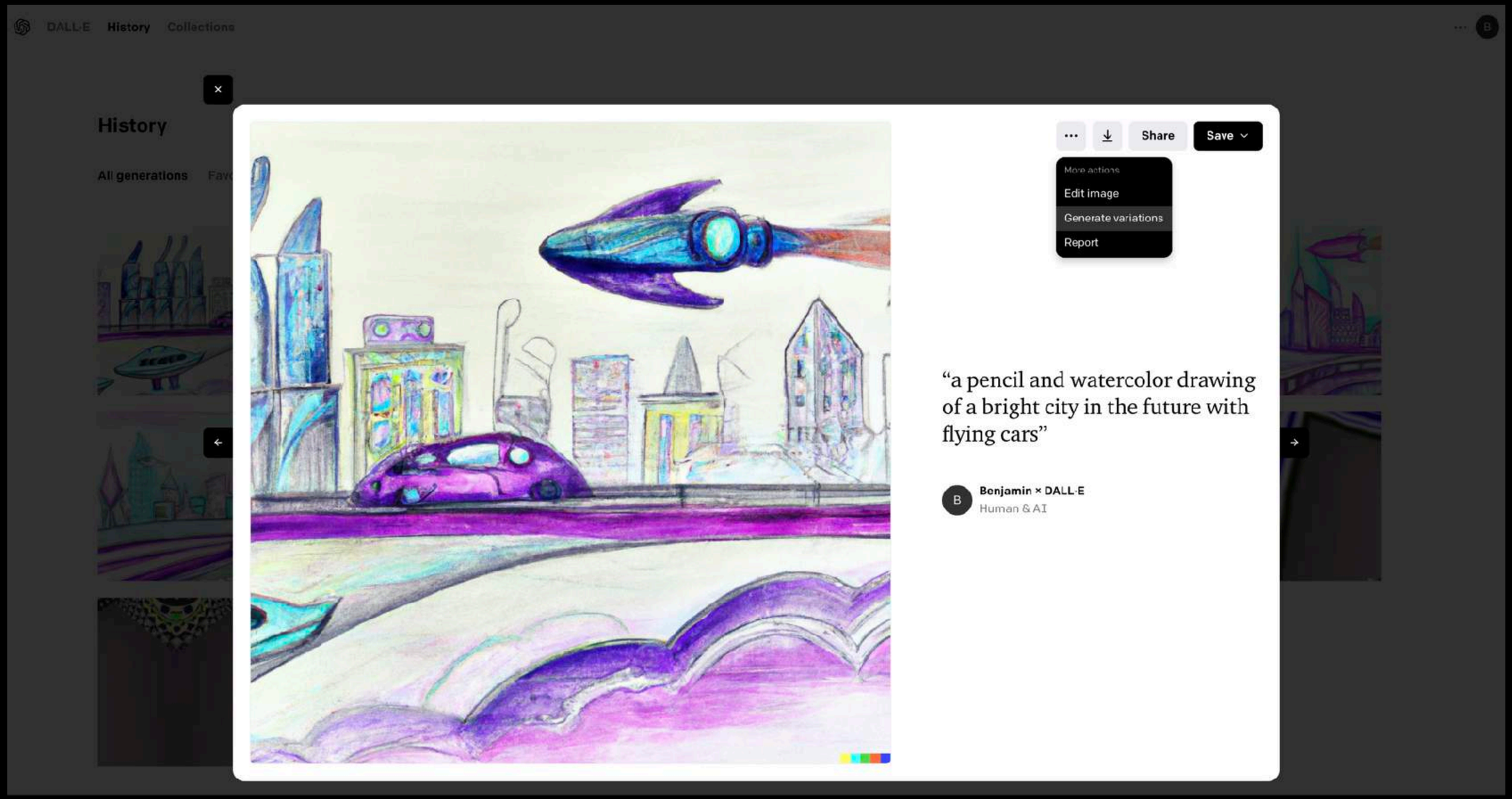
DALL-E 2 - HOW DO YOU USE IT?



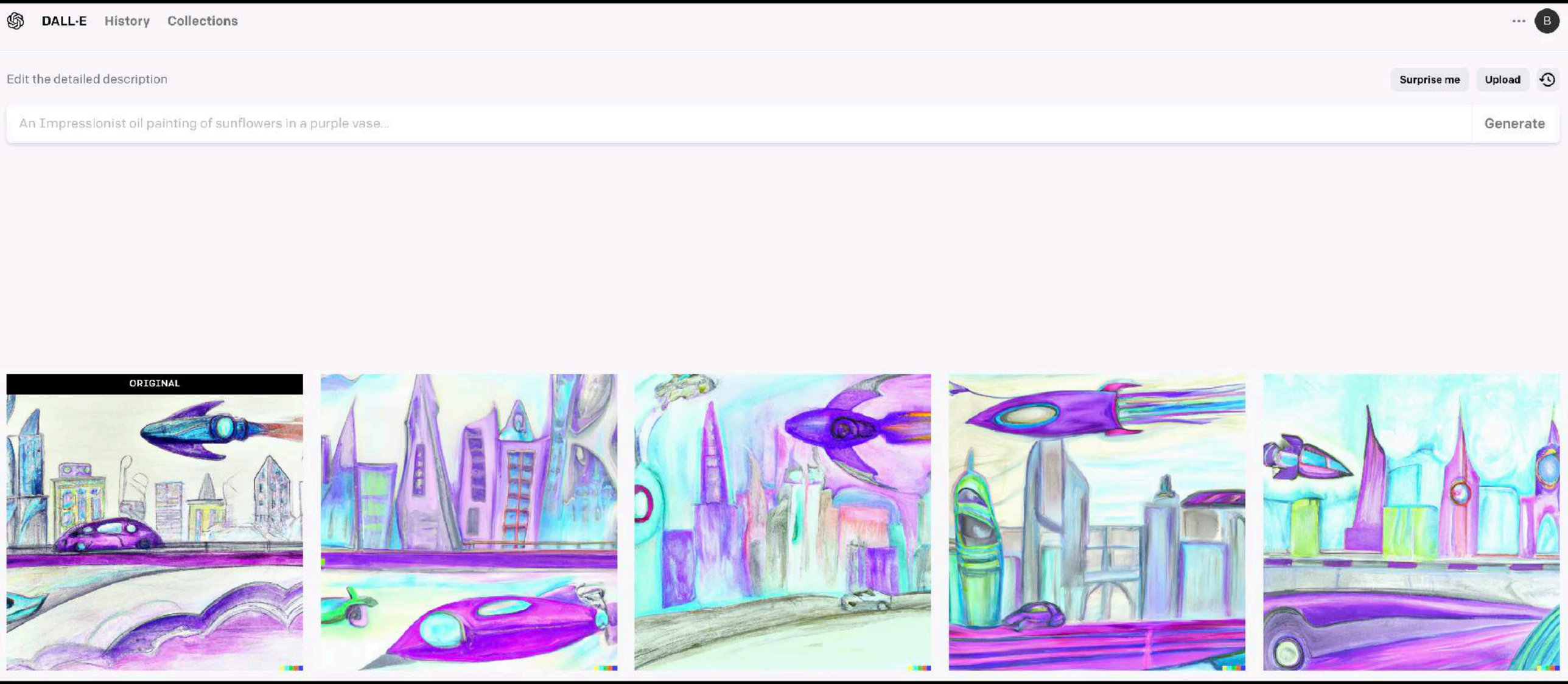
DALL-E 2 - HOW DO YOU USE IT?



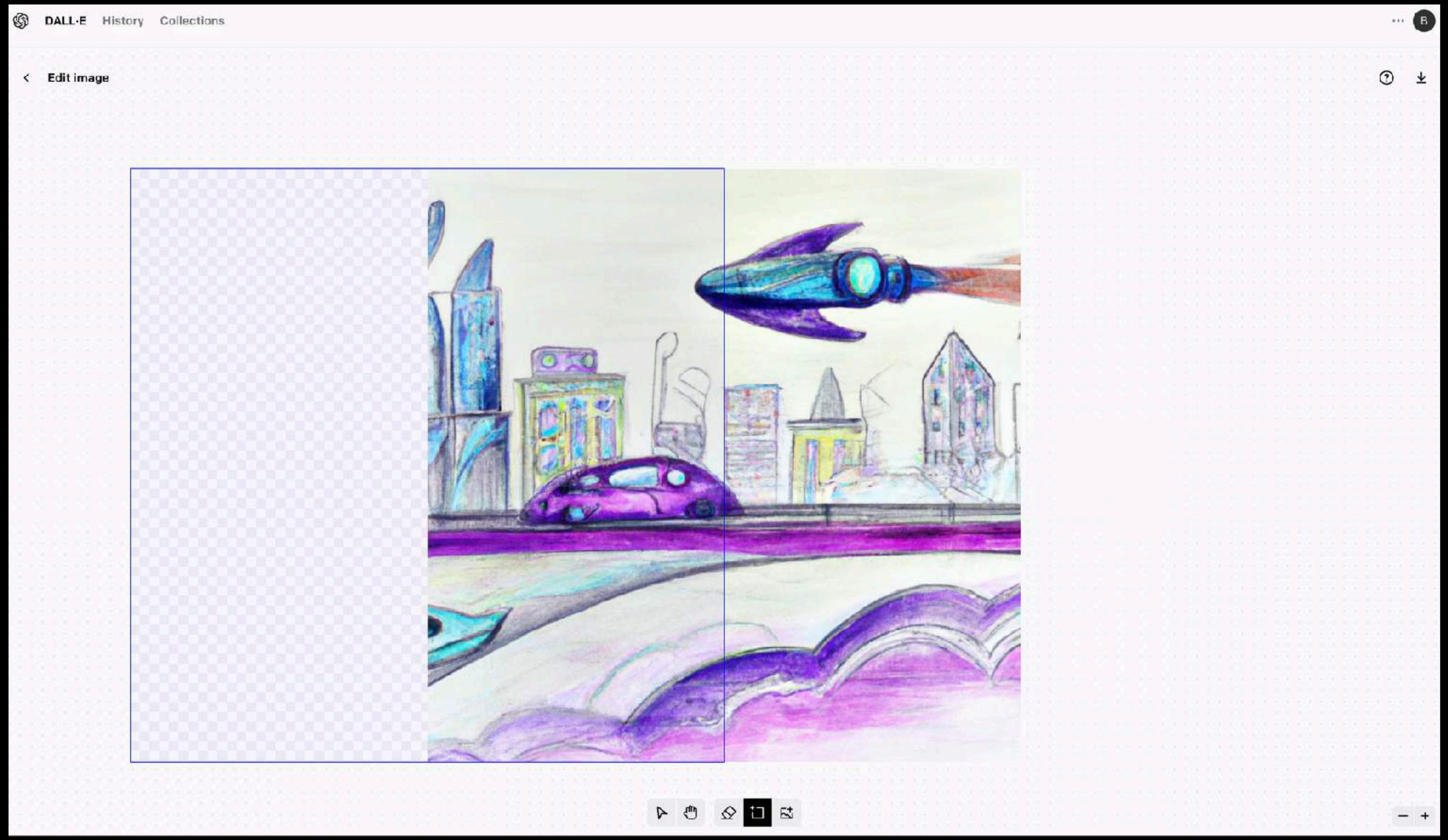
DALL-E 2 - VARIATIONS



DALL-E 2 - VARIATIONS



DALL-E 2 - OUTPAINTING



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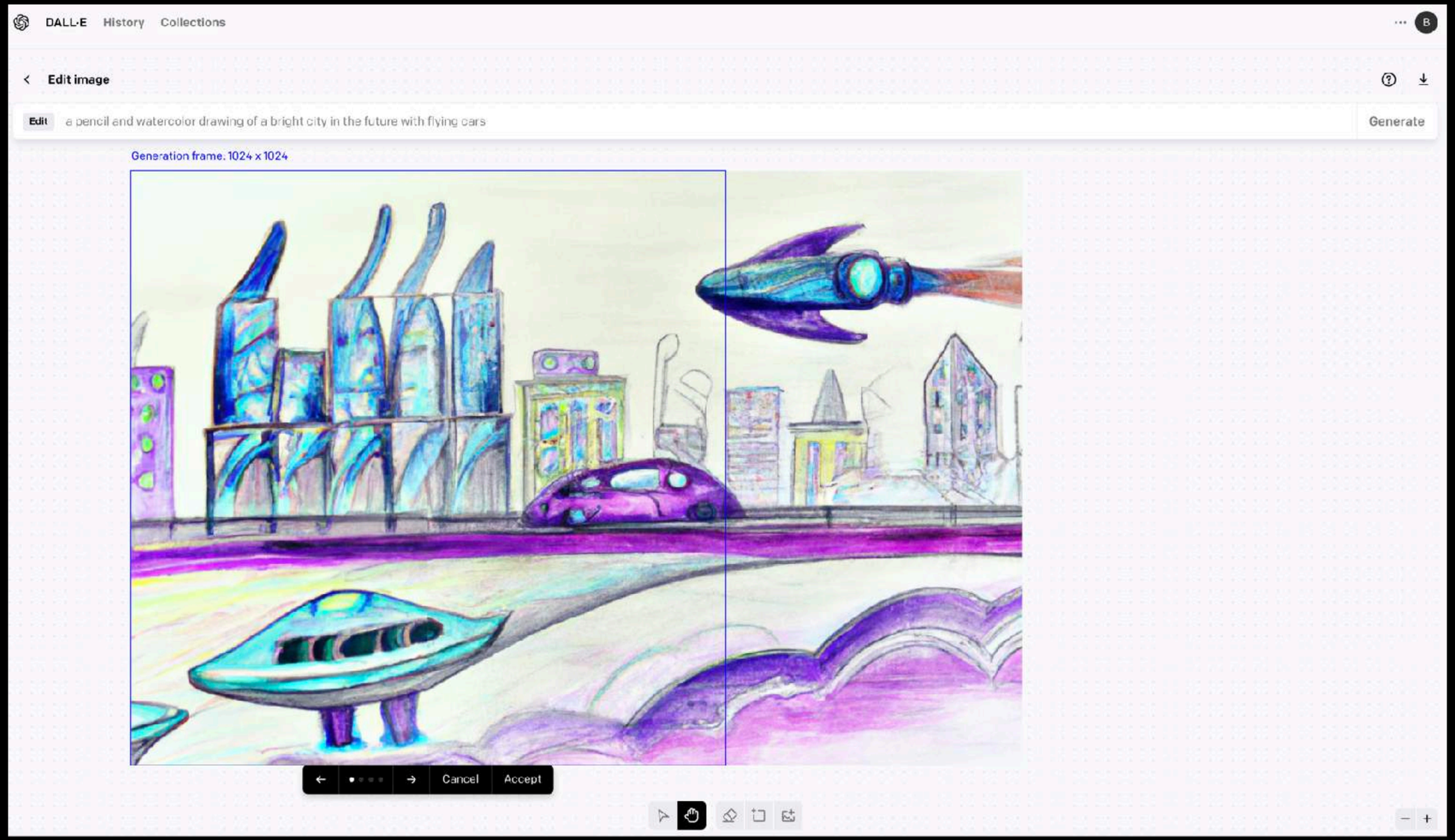
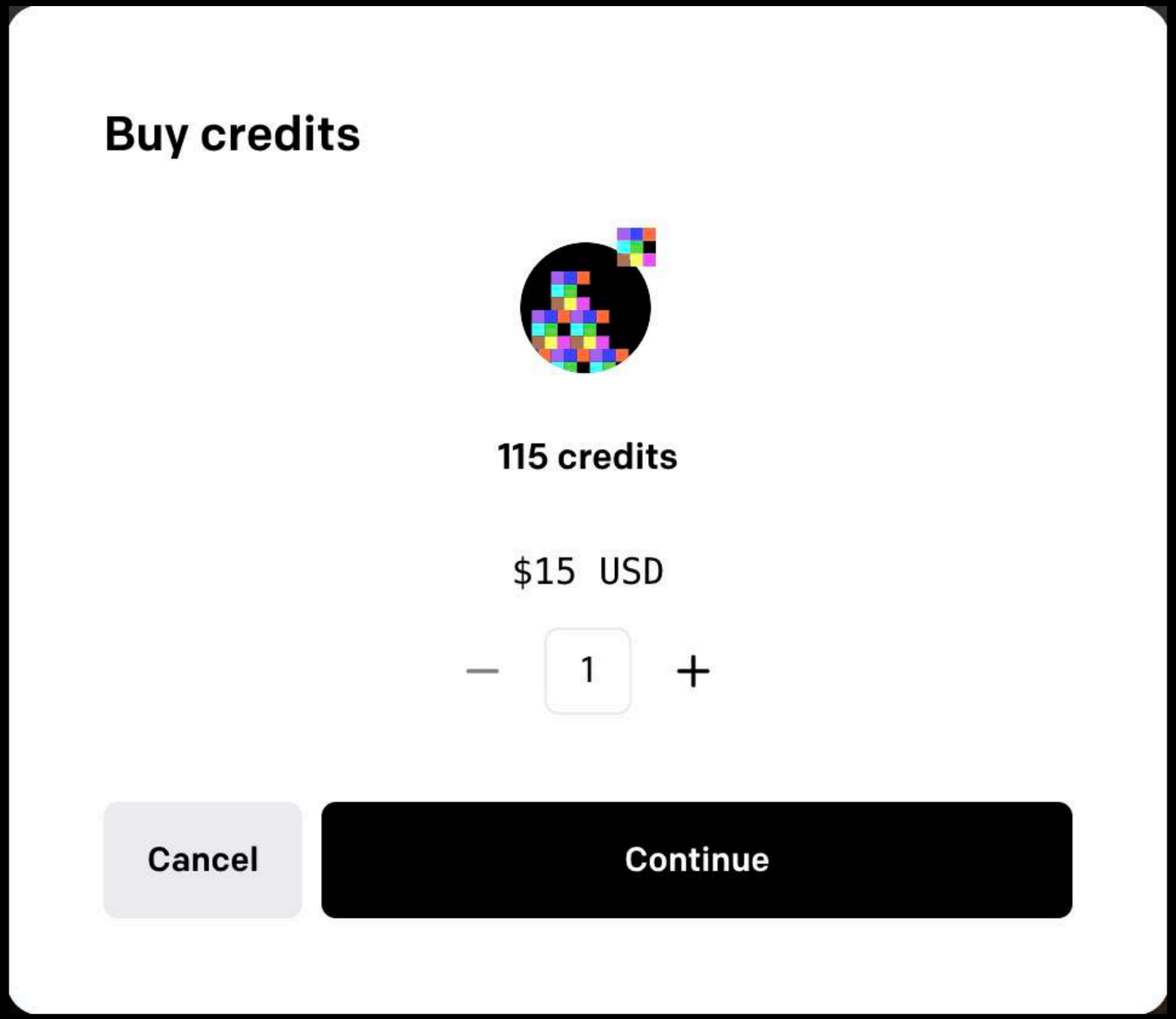
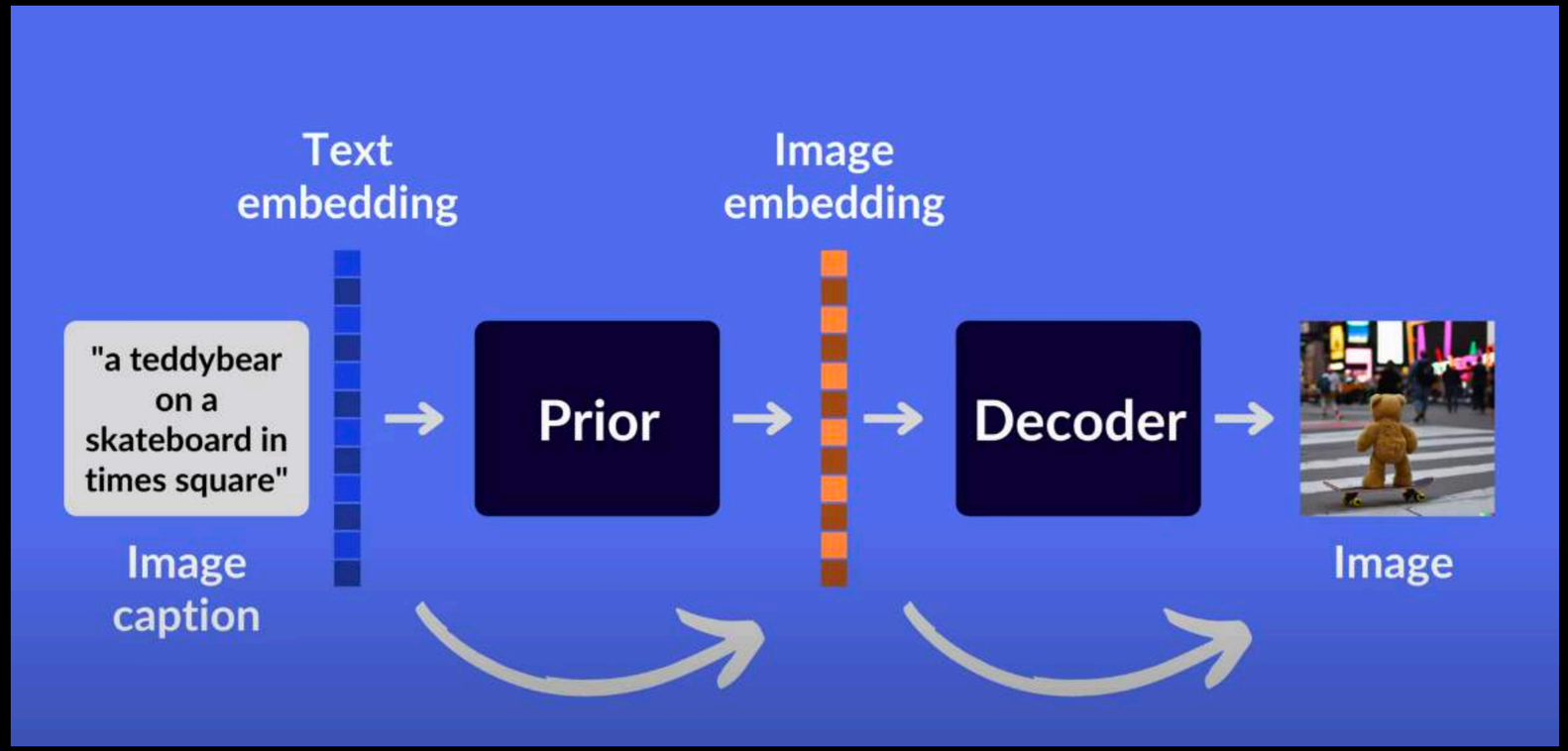


DALL-E 2 - OUTPAINTING

DALL-E 2 - HOW MUCH DOES IT COST?



DALL-E 2 - HOW DOES IT WORK?



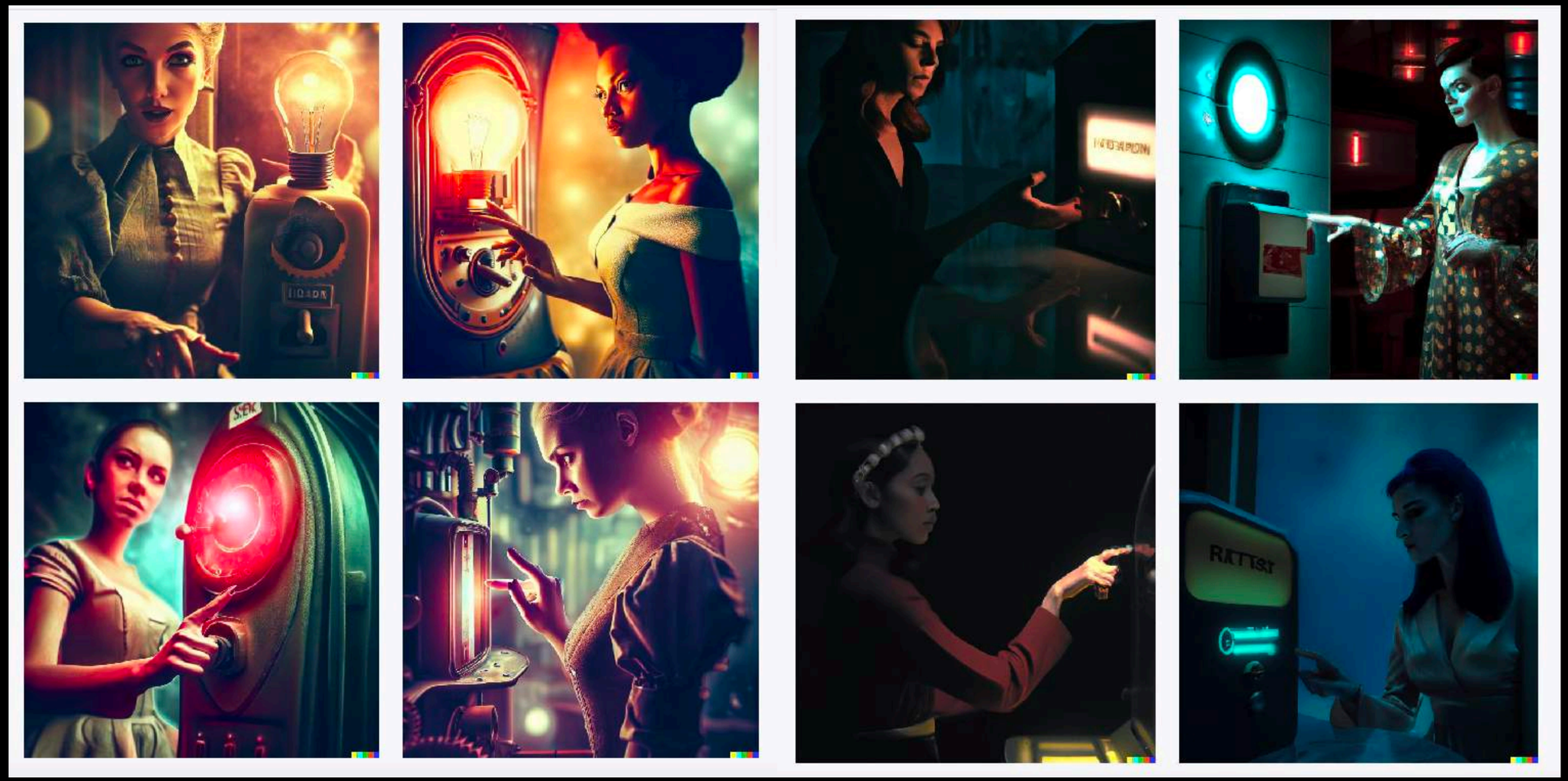
Mountains oil painting

Sleeping puppy

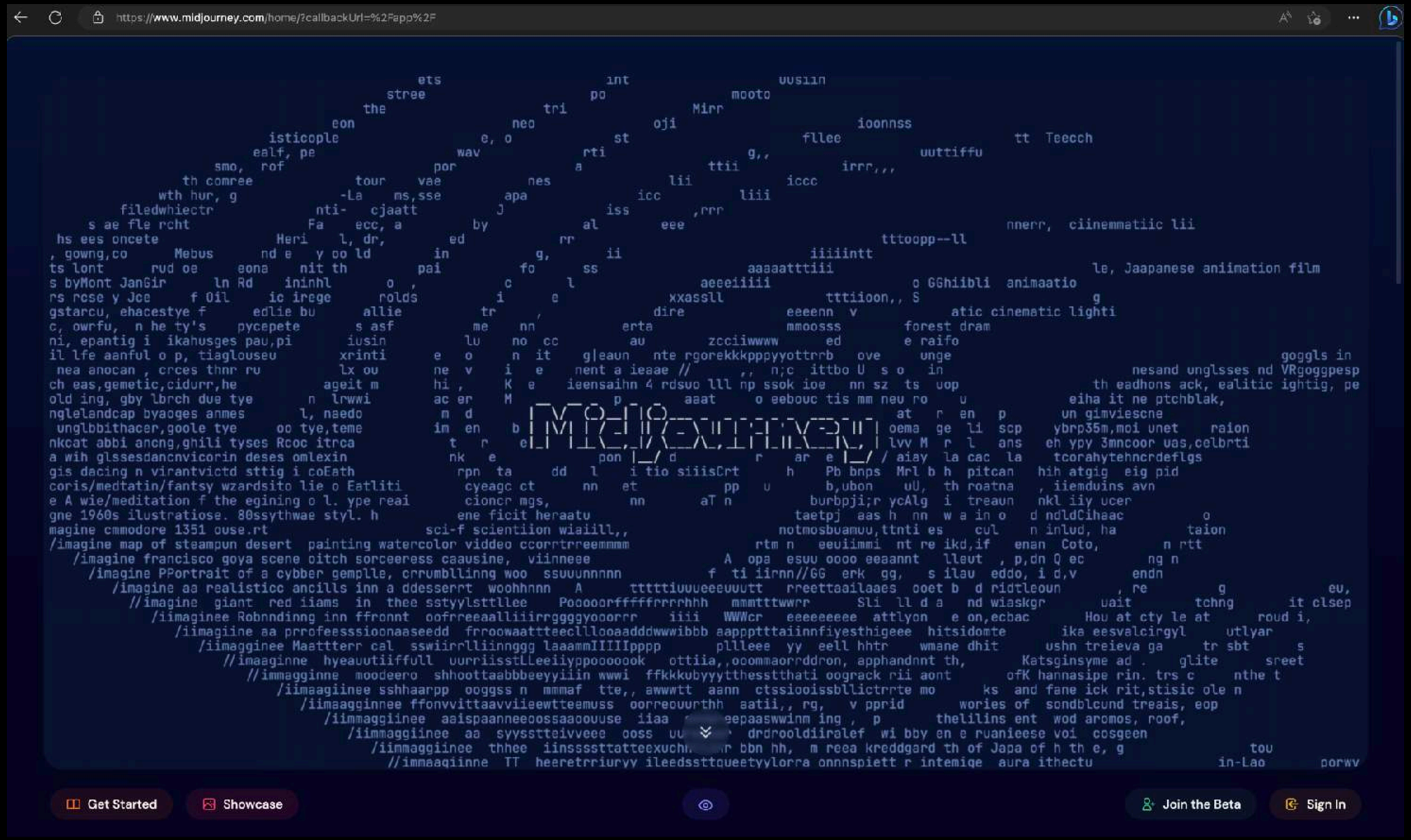
Batman and Superman

DALL-E 2 - WHAT'S NEXT

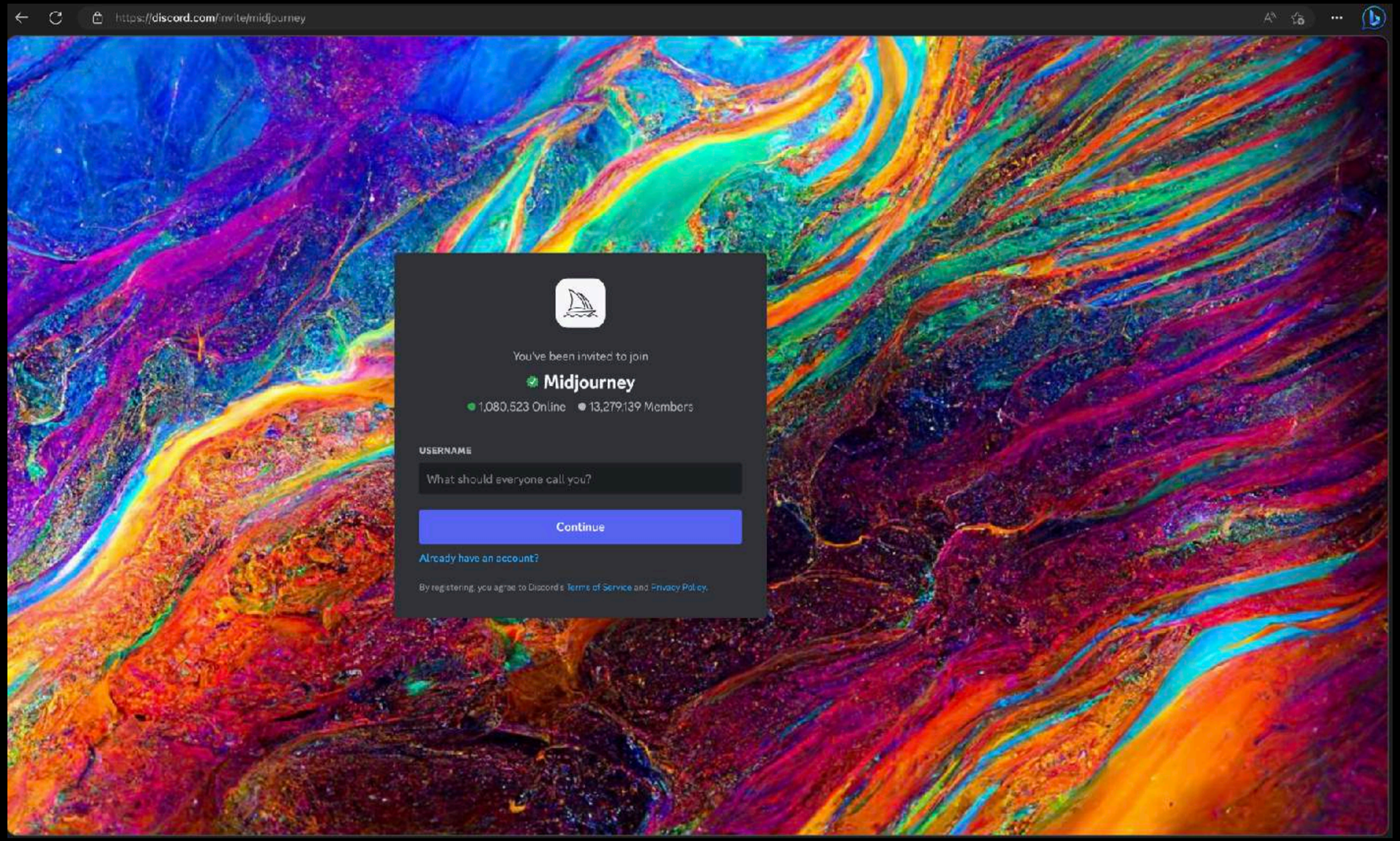
- New model in alpha testing (as of March 4th).



MIDJOURNEY - WHAT IS IT?



MIDJOURNEY - HOW DO YOU USE IT?



MIDJOURNEY - HOW DO YOU USE IT?

prompt The prompt to imagine

/imagine prompt a pencil and watercolor drawing of a bright city in the future with flying cars

Midjourney Bot ✓ BOT Today at 4:59 PM

a pencil and watercolor drawing of a bright city in the future with flying cars --upbeta --q 2 --v 4 - @TheBenMeadows (fast)

U1 U2 U3 U4

V1 V2 V3 V4

MIDJOURNEY - HOW DO YOU USE IT?

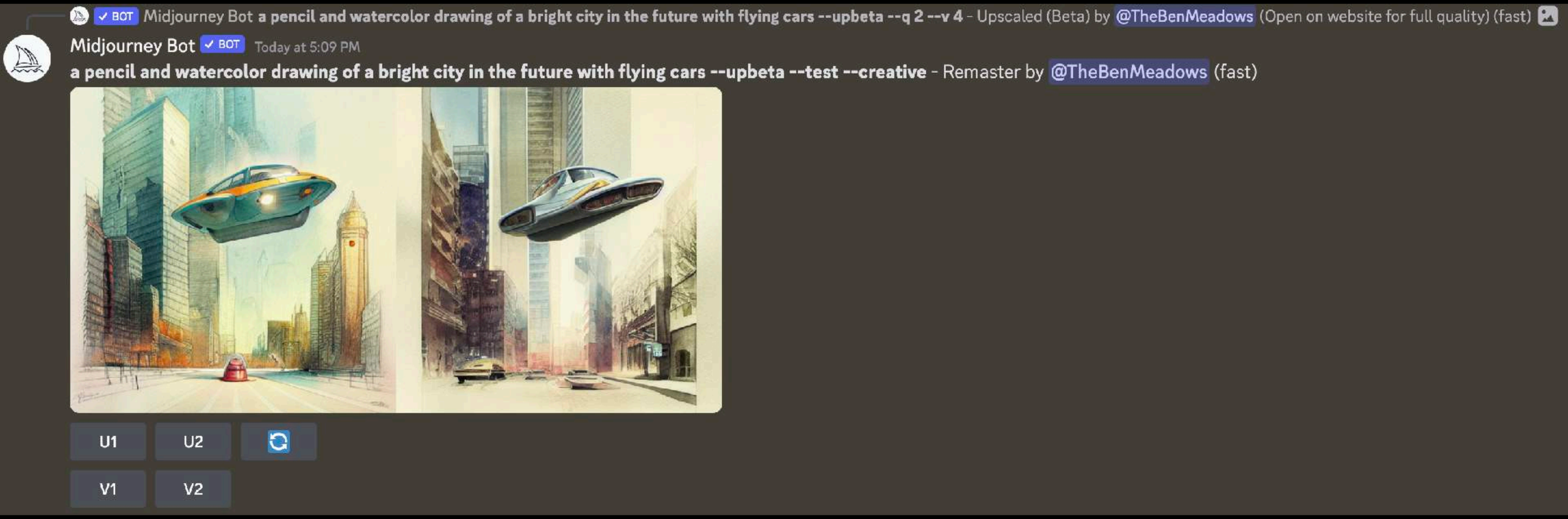
BOT Midjourney Bot **a pencil and watercolor drawing of a bright city in the future with flying cars --upbeta --q 2 --v 4** - @TheBenMeadows (fast)

Midjourney Bot BOT Today at 5:05 PM

a pencil and watercolor drawing of a bright city in the future with flying cars --upbeta --q 2 --v 4 - Upscaled (Beta) by @TheBenMeadows (Open on website for full quality) (fast)

Make Variations | Light Upscale Redo | Detailed Upscale Redo | NEW Remaster | Web

MIDJOURNEY - HOW DO YOU USE IT?



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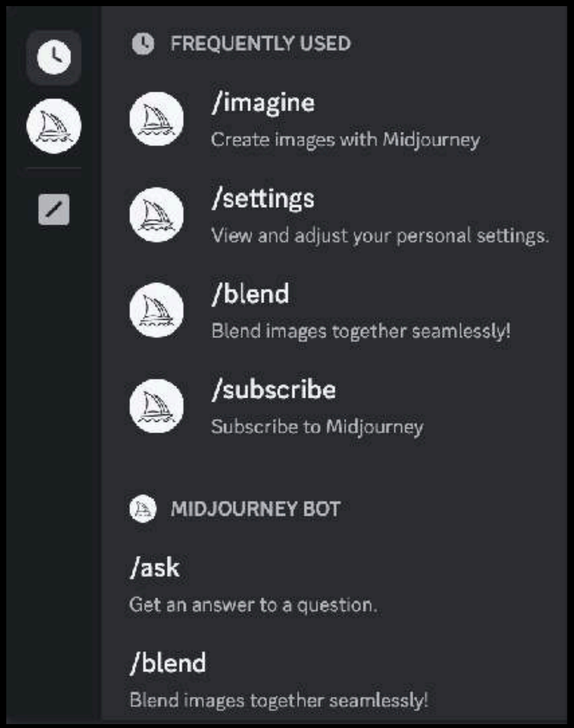

MIDJOURNEY - HOW DO YOU USE IT?

a pencil and watercolor drawing of a bright city in the future with flying car --s 750 --upbeta --q 2 --v 4 - @TheBenMeadows (fast)

U1 U2 U3 U4 🔄

V1 V2 V3 V4

MIDJOURNEY - HOW DO YOU USE IT?

a pencil and watercolor drawing of a bright city in the future with flying cars --upbeta --q 2 --niji - @TheBenMeadows (fast)

U1 U2 U3 U4

V1 V2 V3 V4

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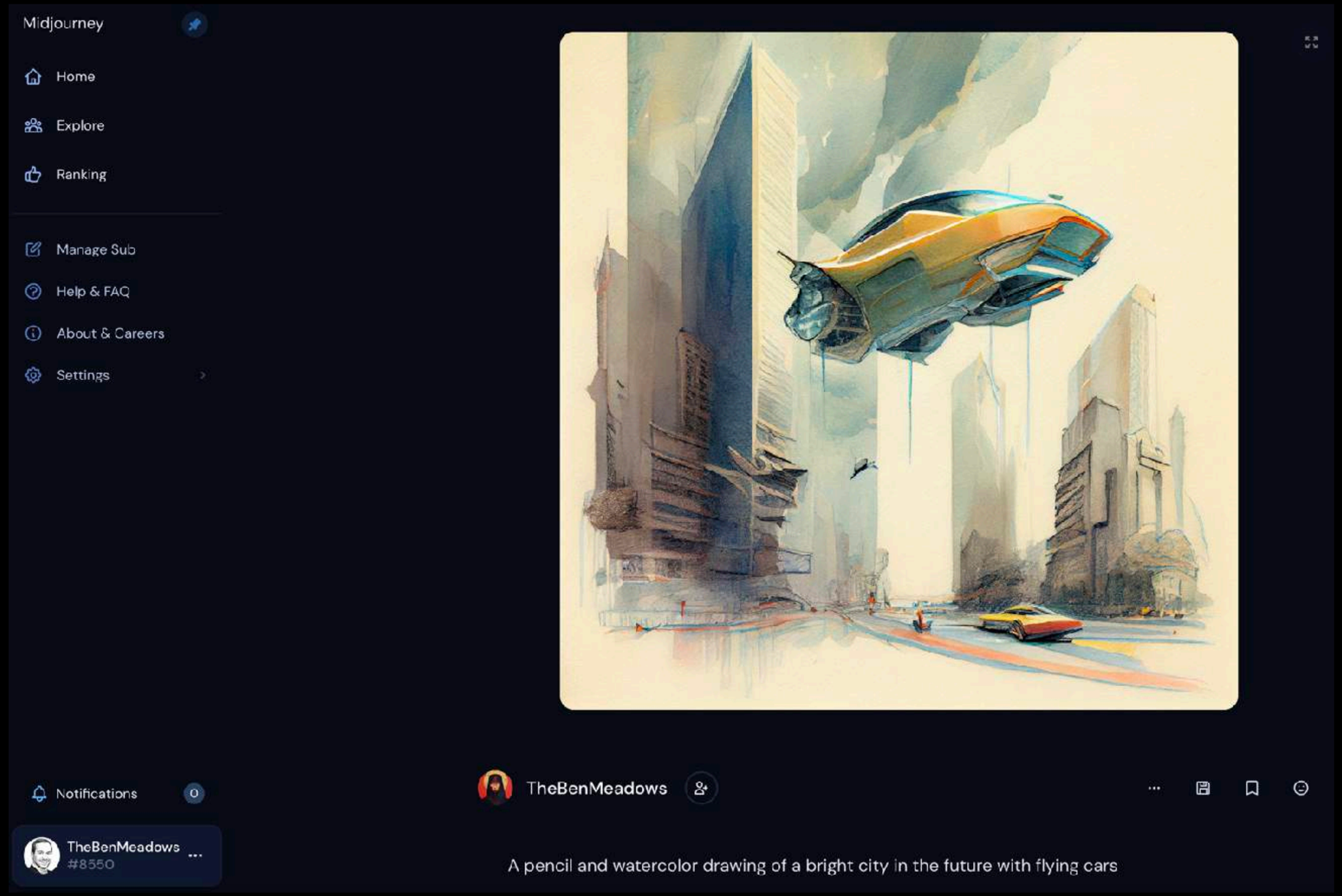

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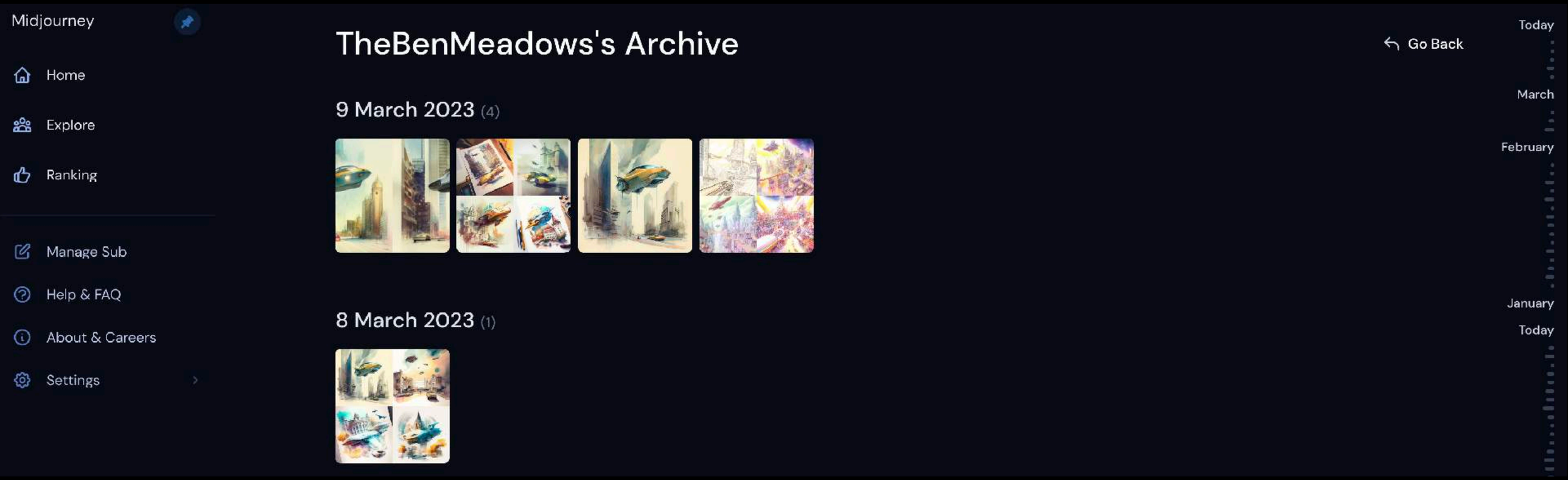


MIDJOURNEY - IMAGE PROMPT

/imagine There are endless possibilities...

/imagine prompt https://example/tulip.jpg https://example/tulip2.jpg a field of tulips in the style of Mary Blair --no farms --iw .5 --ar 3:2

Image Prompt | Text Prompt | Parameters

Open in Browser

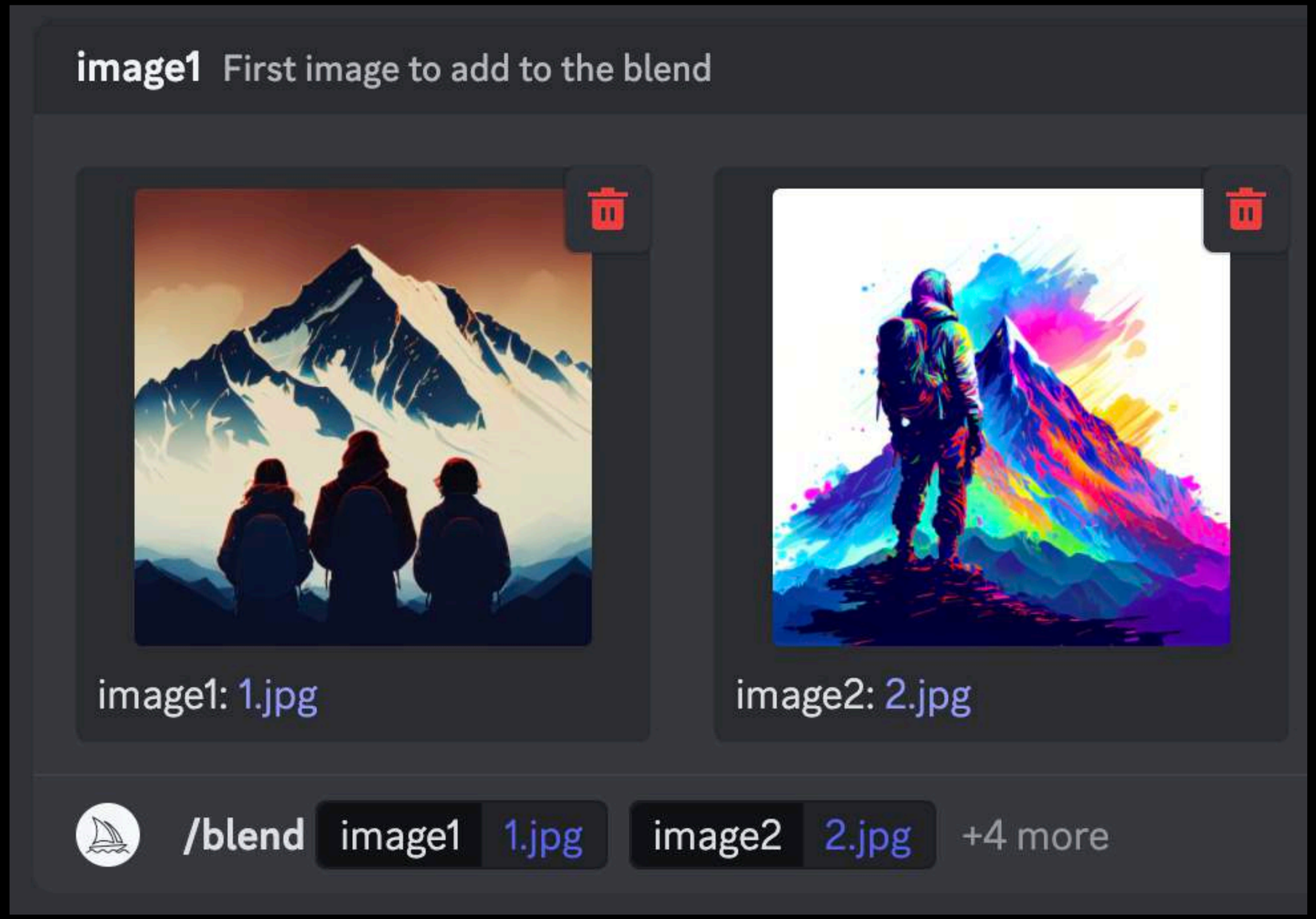
https://s.mj.run/4pa3cOUUhHc style of John Constable --upbeta --q 2 --v 4 - @TheBenMeadows (fast)

U1 U2 U3 U4

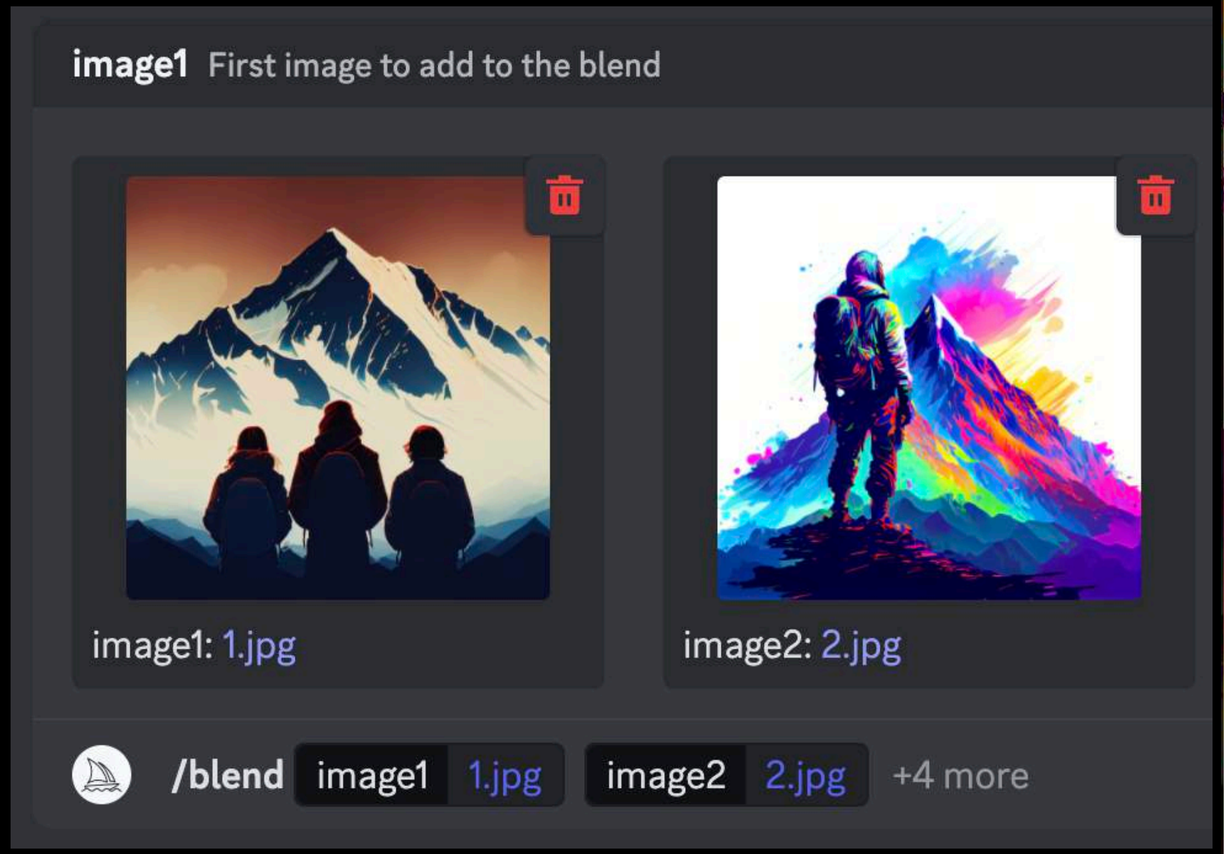
V1 V2 V3 V4

MIDJOURNEY - IMAGE PROMPT

MIDJOURNEY - BLEND IMAGES



MIDJOURNEY - BLEND IMAGES



MIDJOURNEY - HOW MUCH DOES IT COST?

Yearly Billing | Monthly Billing

Basic Plan

$10 / month

Billed monthly

Downgrade Plan

Save with annual billing (20% off) →

- Limited generations (~200 / month)
- General commercial terms
- Access to member gallery
- Optional credit top ups
- 3 concurrent fast jobs

Standard Plan

$30 / month

Billed monthly

Active

Save with annual billing (20% off) →

- 15h Fast generations
- Unlimited Relaxed generations
- General commercial terms
- Access to member gallery
- Optional credit top ups
- 3 concurrent fast jobs

Pro Plan

$60 / month

Billed monthly

Upgrade Plan

Save with annual billing (20% off) →

- 30h Fast generations
- Unlimited Relaxed generations
- General commercial terms
- Access to member gallery
- Optional credit top ups
- Stealth image generation
- 12 concurrent fast jobs

MIDJOURNEY - WHAT'S NEXT?

DavidH Today at 5:26 PM

Hi @everyone we're close to releasing our next-gen image system! Before we do it though *we need your help*

If you're a paying MJ member, please go to the following URL and help us rate images
https://midjourney.com/rate/pairs/v5-one-staging/

Directions:
- You'll be shown two images at a time
- Please select the one that you like more
(based on your own personal aesthetic taste)
- You'll get the best rating experience on mobile
- On PC you can use the 1 and 2 keys to select images (1 is left, 2 is right)
- If you see NSFW images click the other image or press 'skip' (Sorry!)

Please Note:
- These images are not representative of the V5 algorithms we will release soon
- These images are plain/boring/unopinionated to help the system 'learn' whether v5 should have a different style from v4
- You should notice images are higher resolution and have generally better detail and stylistic range than v4
- If you're worried about quality check out images from the pre-v4 rating-party as a comparison to today https://www.midjourney.com/rate/aazto/

MIDJOURNEY

Worms
@MarcoWorms

#midjourney v1 to v4 comparission for the same seed and prompt:

"an aviator cat that pilots the red baron"

order:
v1 - v2
v3 - v4

v4 had a huge leap in polishing the output, it's incredible!

MIDJOURNEY - WHAT'S NEXT?

MIDJOURNEY - WHAT'S NEXT?

Eric Hu
@_EricHu

"DJ Khaled as a minion" on Midjourney V1 vs V4 (latest)

STABLE DIFFUSION - WHAT IS IT?

https://stability.ai/about

stability.ai

API Company News

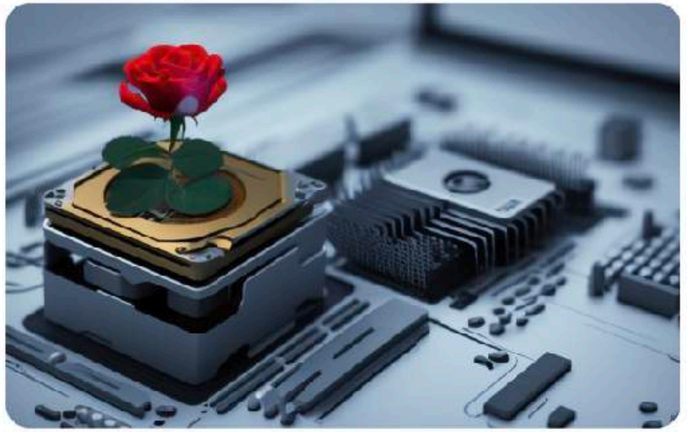
We are the world's leading open source generative AI company

Our goal is to maximize the accessibility of modern AI to inspire global creativity and innovation.

Since launching our AI initiative in 2021, we have amassed a community of more than 140,000 developers and seven research hubs throughout the world.

We strongly believe that our open source ethos provides the definitive path for the creation and access of cutting-edge research. Stability AI-backed research communities are currently developing breakthrough AI models applied to imaging, language, code, audio, video, 3D content, design, biotech and other scientific research.

Our partnership with Amazon Web Services provides us with the world's fifth-largest supercomputer - the Ezra-1 UltraCluster - supplying the necessary power to generate these advancements.



STABLE DIFFUSION - WHAT IS IT?

Bing AI - Search | About — Stability AI

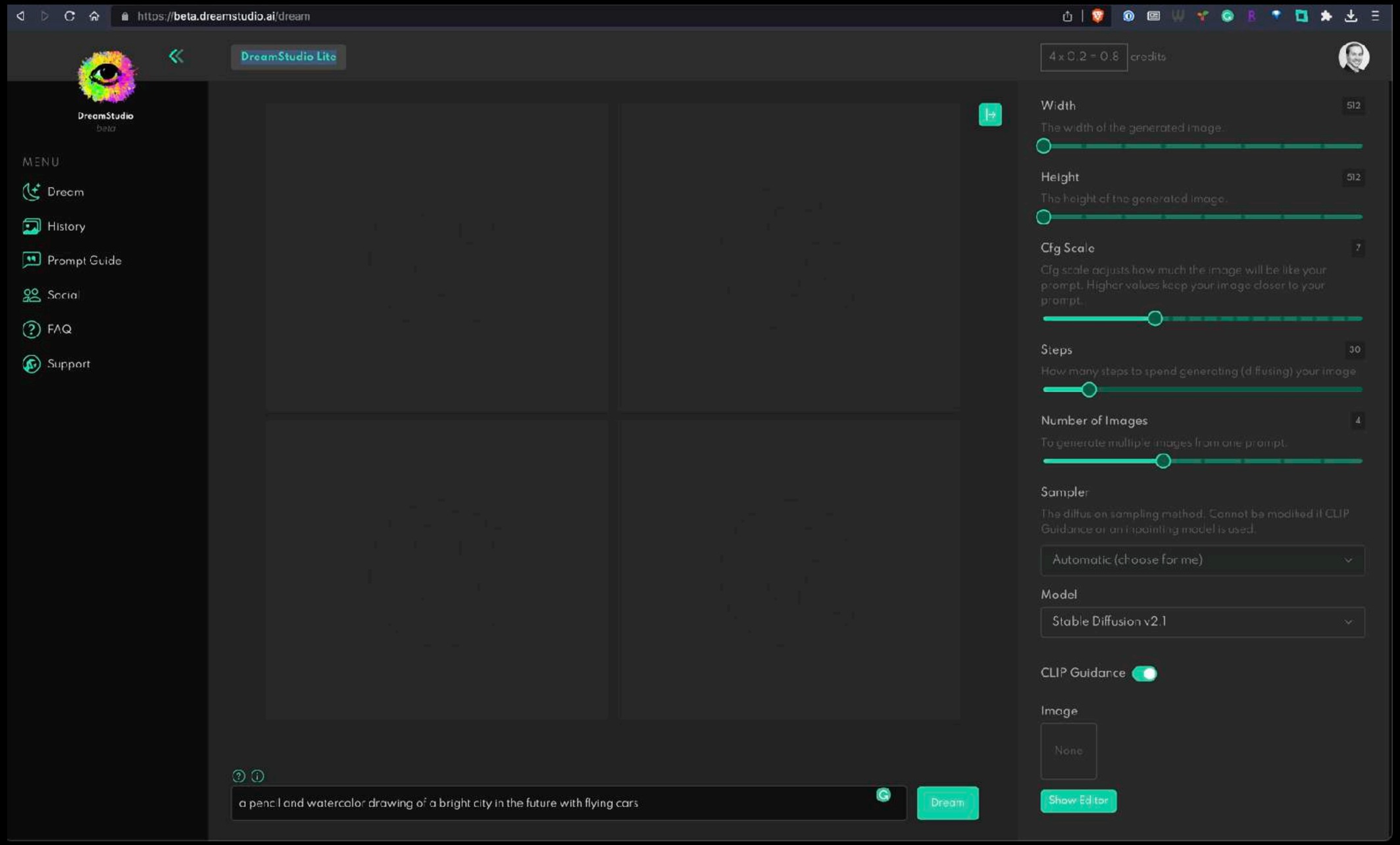
https://stability.ai/about

In August 2022 we co-launched the first release of Stable Diffusion, a pioneering text-to-image model for which we provided the use of Ezra-1.Stable Diffusion 2.0 was released in November 2022, and has been entirely funded and developed by Stability AI.

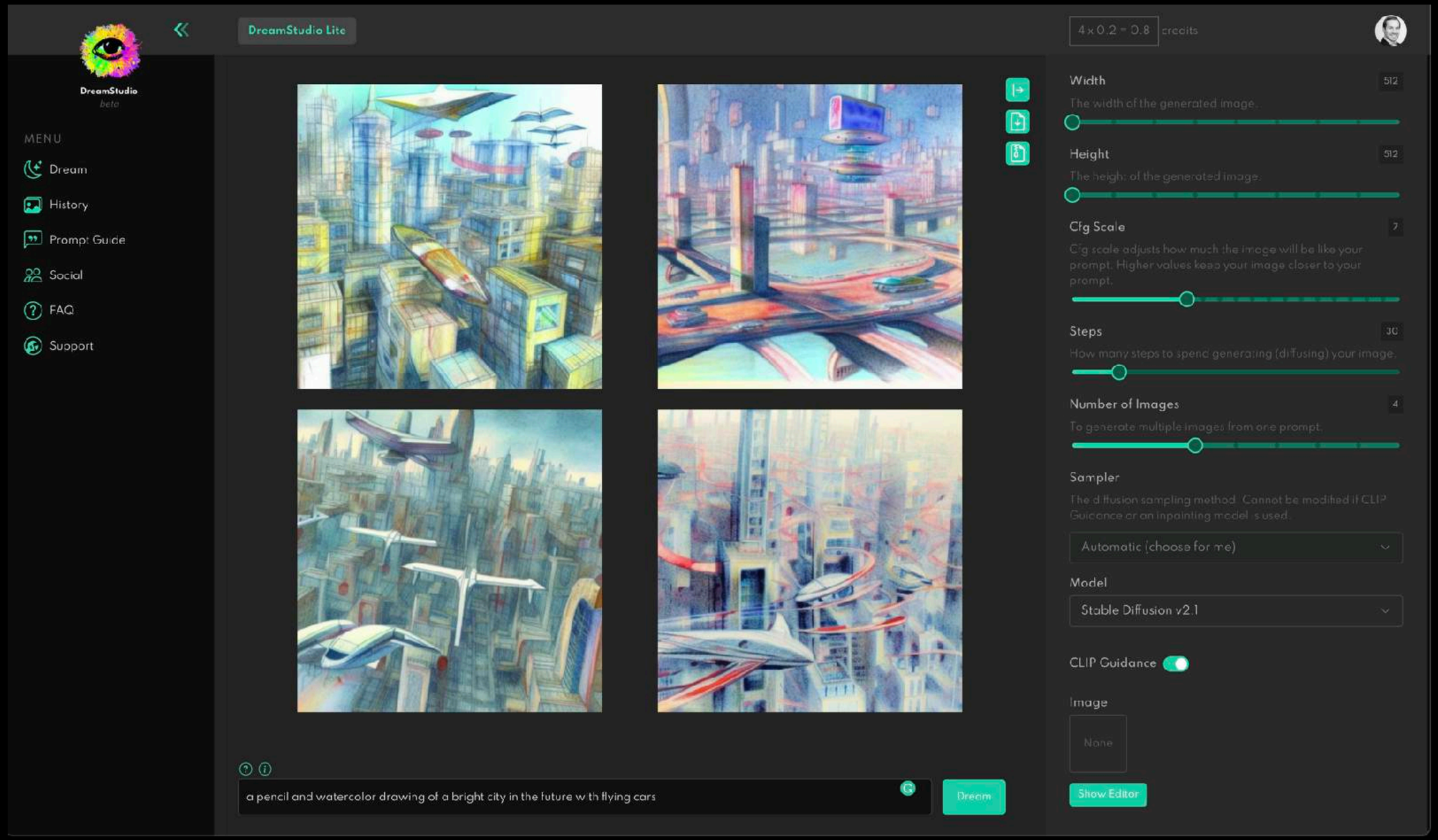
Creating applications on Stable Diffusion's open-source platform has proved wildly successful. Just one month after the release of SD 2.0, four of the top 10 applications on Apple's App Store were powered by Stable Diffusion.

Meanwhile, Stability AI's premium imaging application DreamStudio, alongside externally built products like Lensa, Wonder and NightCafe, have amassed more than 40 million downloads and counting. Stay tuned for further exciting developments on the way!

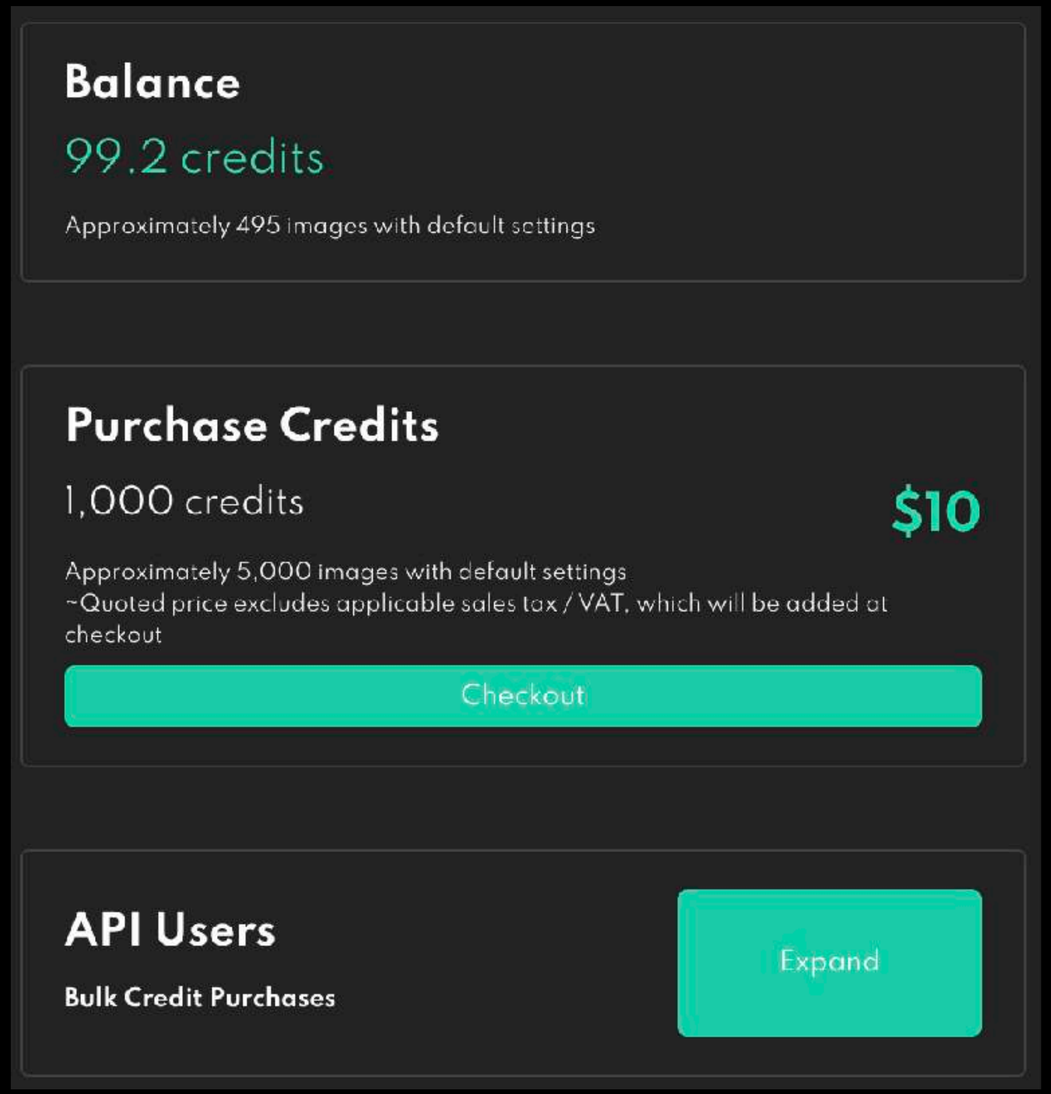
STABLE DIFFUSION - HOW DO YOU USE IT?



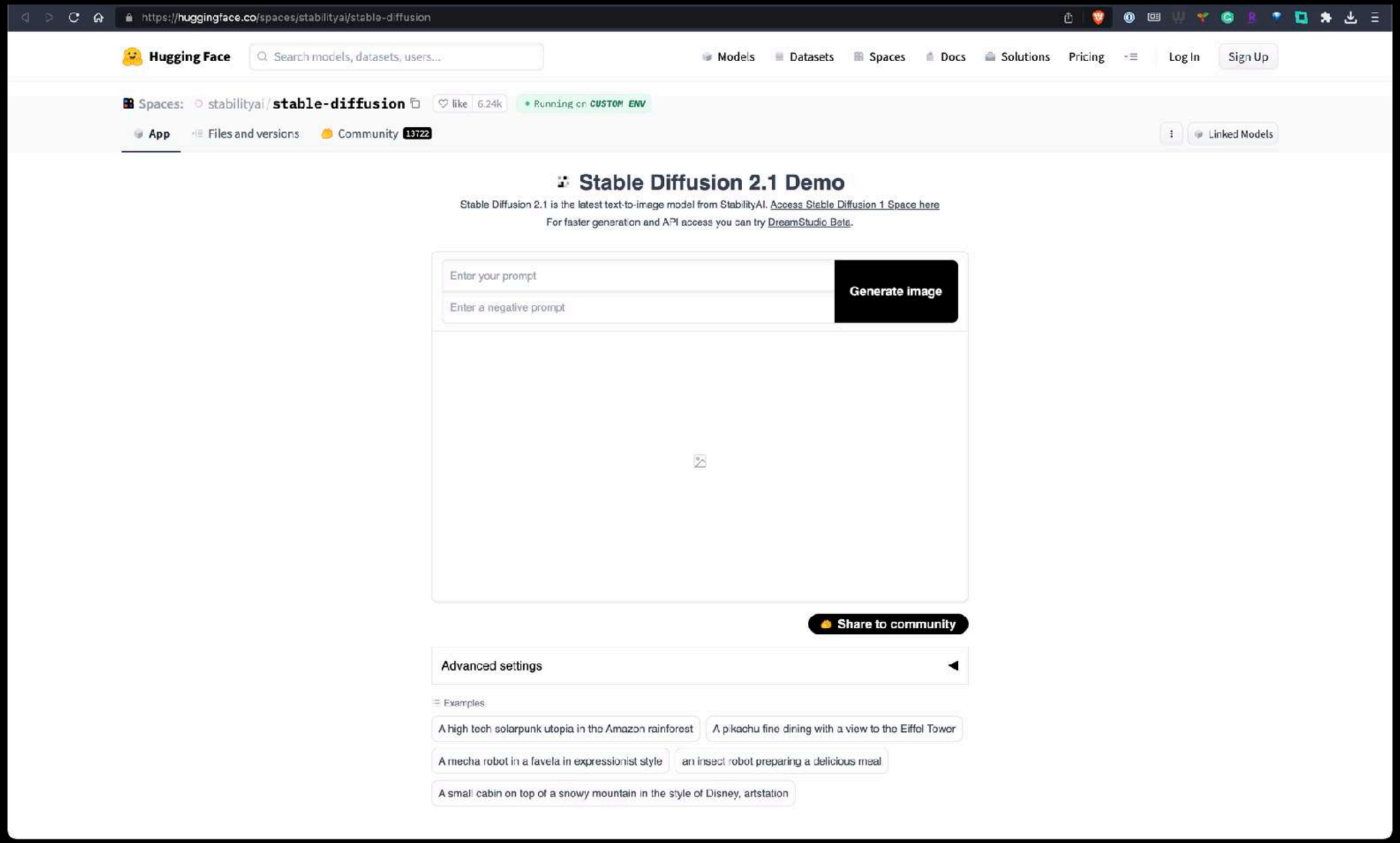
STABLE DIFFUSION - HOW DO YOU USE IT?



STABLE DIFFUSION - HOW MUCH DOES IT COST?



STABLE DIFFUSION - HOW DO YOU USE IT?



STABLE DIFFUSION - HOW DO YOU USE IT?

https://stablehorde.net

AI Horde

This is a crowdsourced distributed cluster of Image generation workers and text generation workers. If you like this service, consider joining the horde yourself!

For more information, check the FAQ. Finally you can also follow the main developer's blog

Latest News

- The Horde Ratings are back in action. Go to your typical UI and rate away!
- KoboldAI Horde has been merged into Stable Horde as a unified AI Horde!
- The Horde now supports ControlNet on all models! All kudos go to hlky who again weaved the dark magic!

Stats

Image Generation

- Average Recent Performance: 71.4 megapixelsteps per second.
- Total generated: 413.0 terapixelsteps.
- Total image requests fulfilled: 33.1M.
- Active Workers/Threads: 57/67
- Queue: 43 requests for a total of 457.7 megapixelsteps.

Text Generation

- Average Recent Performance: 462.97 tokens per second.
- Total generated: 17.6 megatokens.
- Total texts requests fulfilled: 212.4K.
- Active Workers/Threads: 16/16
- Queue: 0 requests for a total of 0 tokens.

Image Interrogation

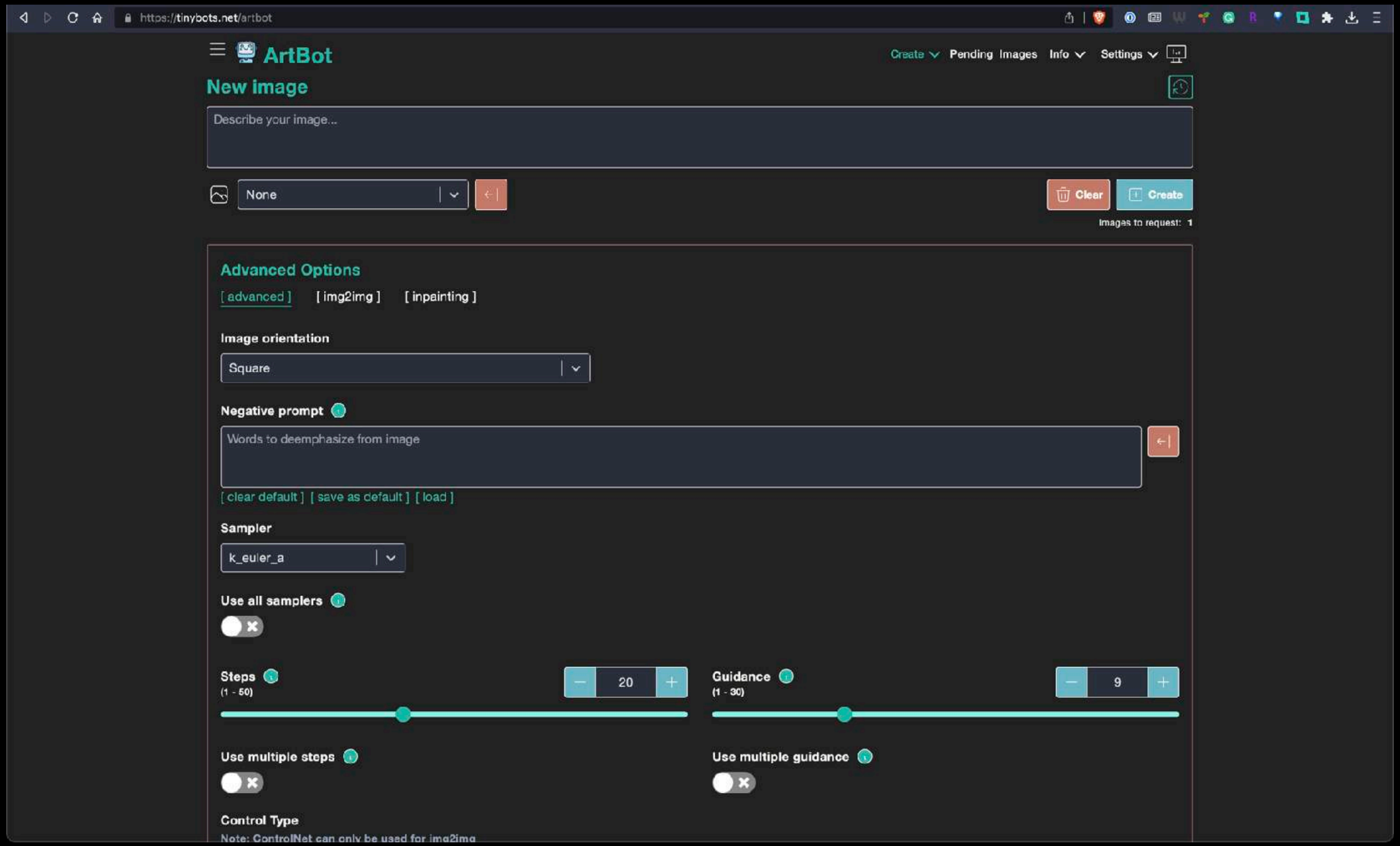
- Total images interrogated: 179.3K.
- Active Interrogation Processing Workers/Threads: 11/65
- Interrogation Queue: 3 interrogation forms.

Usage

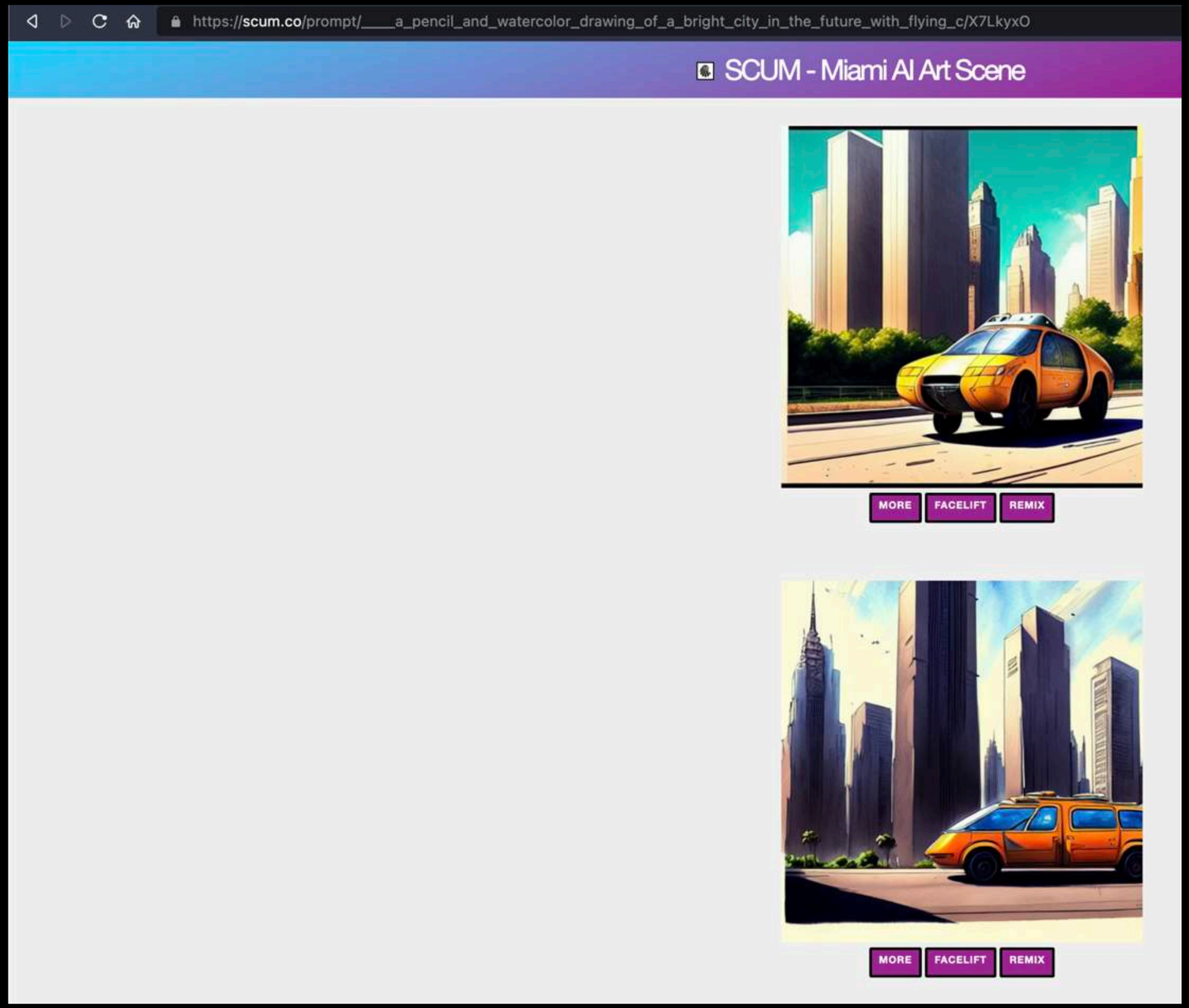
First Register an account which will generate for you an API key. Store that key somewhere.

- if you do not want to register, you can use '0000000000' as api_key to connect anonymously. However anonymous accounts have the lowest priority when there's too many concurrent requests!
- To increase your priority you will need a unique API key and then to increase your Kudos. Read how Kudos are working.

STABLE DIFFUSION - HOW DO YOU USE IT?



STABLE DIFFUSION - HOW DO YOU USE IT?



STABLE DIFFUSION - HOW DO YOU USE IT?

https://scum.co/prompt/____a_pencil_and_watercolor_drawing_of_a_bright_city_in_the_future_with_flying_c/X7LkyxO

MORE FACELIFT REMIX

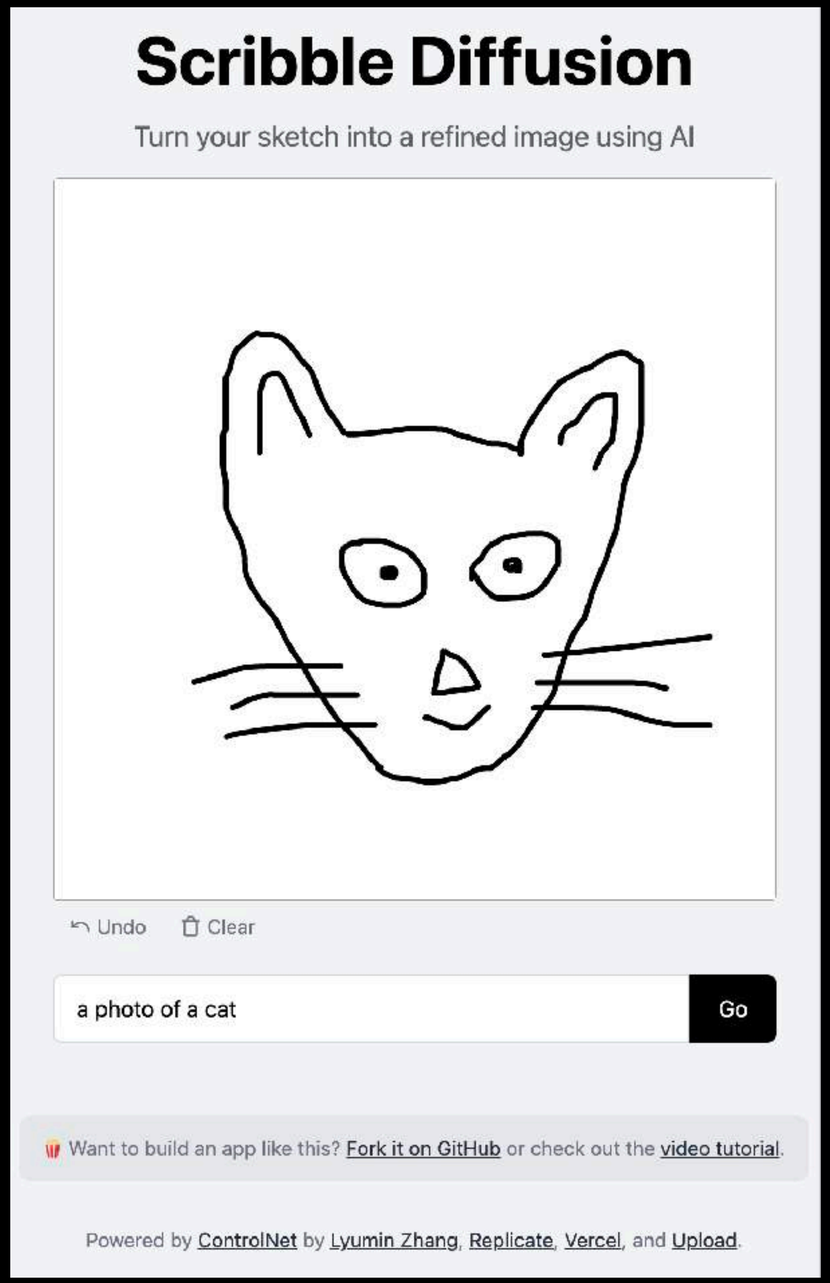
MORE FACELIFT REMIX

/recipe:cinematic /sampler:ddim /guidance:7 (((/recipe:cinematic a pencil and watercolor drawing of a bright city in the future with flying cars))), (((realistic))),((((f/0.3)))), (((heavy shadows:5.5))), (realistic reflections), (((dust motes))),✨, (octane render:3.6), (dramatic:0.9),(sunlight:0.5),(lensflare:99), (((bokeh))),fisheye:9,(global illumination),((rays)),(((((((((extreme closeup:999))))))))),(((bokehs))), rim-light, pano, QuickTime, (Tilt-shift), Vaseline,((face shot)), ((cinematic)), (cropped:9),(8k),(4K), IBL, (Reflection-mapped),(((bounce-light))),SH,(hd),(((indirect))), (extremely detailed:12), (((close-up))),(((zoomed-in))), [[[snowglobe],[lightbulb],[flat],[owres],[low detail],[low quality],[bad quality],[compression artifacts],[jpeg artifacts],[distorted],[grainy],[noise]]] <dreamlike>

FLAG

created by **Anon325282** | Fave Bad Broken | More like: **<dreamlike>**

STABLE DIFFUSION - HOW DO YOU USE IT?



STABLE DIFFUSION - HOW DO YOU USE IT?

https://github.com/AUTOMATIC1111/stable-diffusion-webui

README.md

Installation and Running

Make sure the required dependencies are met and follow the instructions available for both NVidia (recommended) and AMD GPUs.

Alternatively, use online services (like Google Colab):

- List of Online Services

Automatic Installation on Windows

1. Install Python 3.10.6, checking "Add Python to PATH"
2. Install git.
3. Download the stable-diffusion-webui repository, for example by running `git clone https://github.com/AUTOMATIC1111/stable-diffusion-webui.git`.
4. Run `webui-user.bat` from Windows Explorer as normal, non-administrator, user.

Automatic Installation on Linux

1. Install the dependencies:

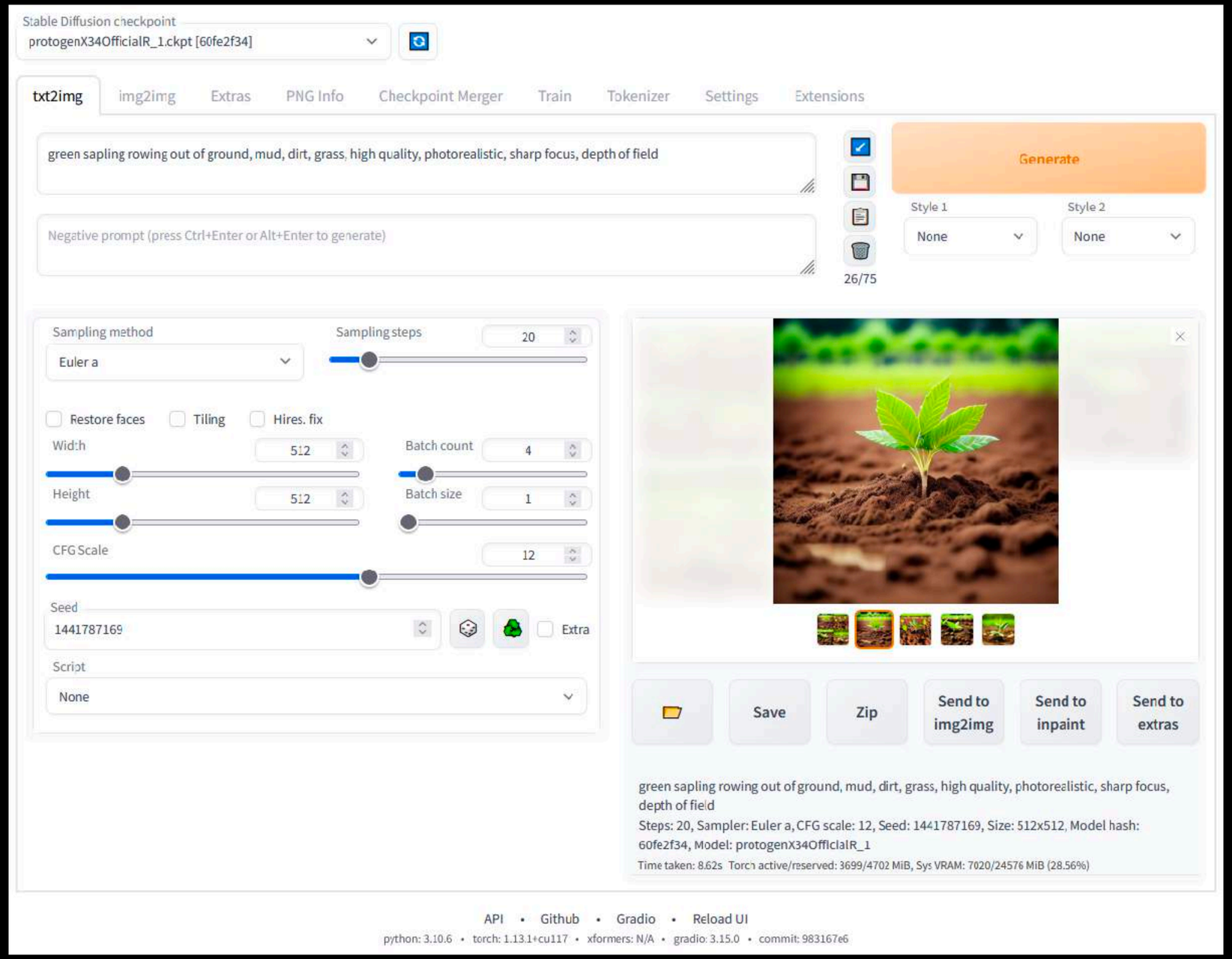
```
# Debian-based:
sudo apt install wget git python3 python3-venv
# Red Hat-based:
sudo dnf install wget git python3
# Arch-based:
sudo pacman -S wget git python3
```

2. To install in `/home/$(whoami)/stable-diffusion-webui/`, run:

```
bash <(wget -qO- https://raw.githubusercontent.com/AUTOMATIC1111/stable-diffusion-webui/master/webu
```

3. Run `webui.sh`.

STABLE DIFFUSION - HOW DO YOU USE IT?



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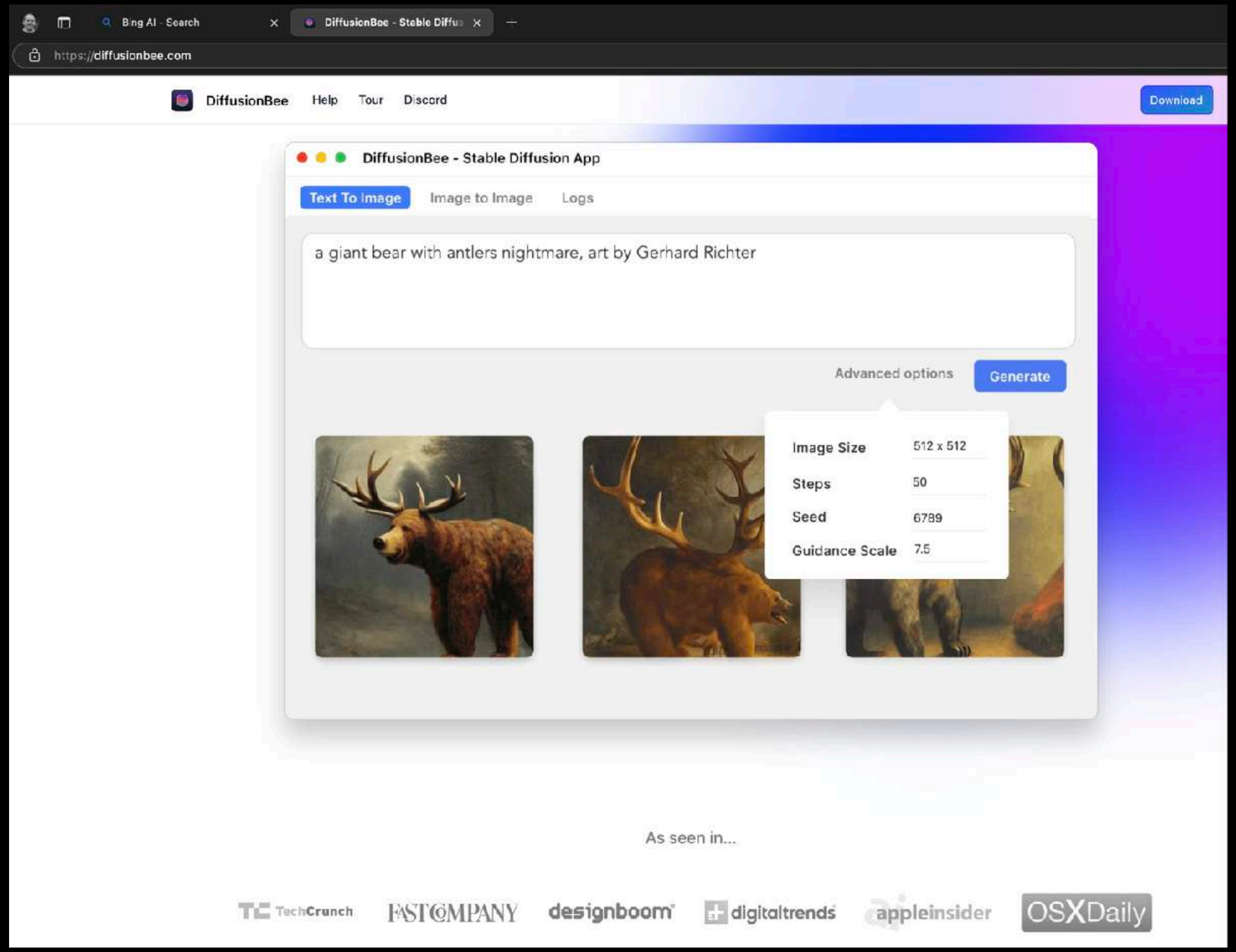

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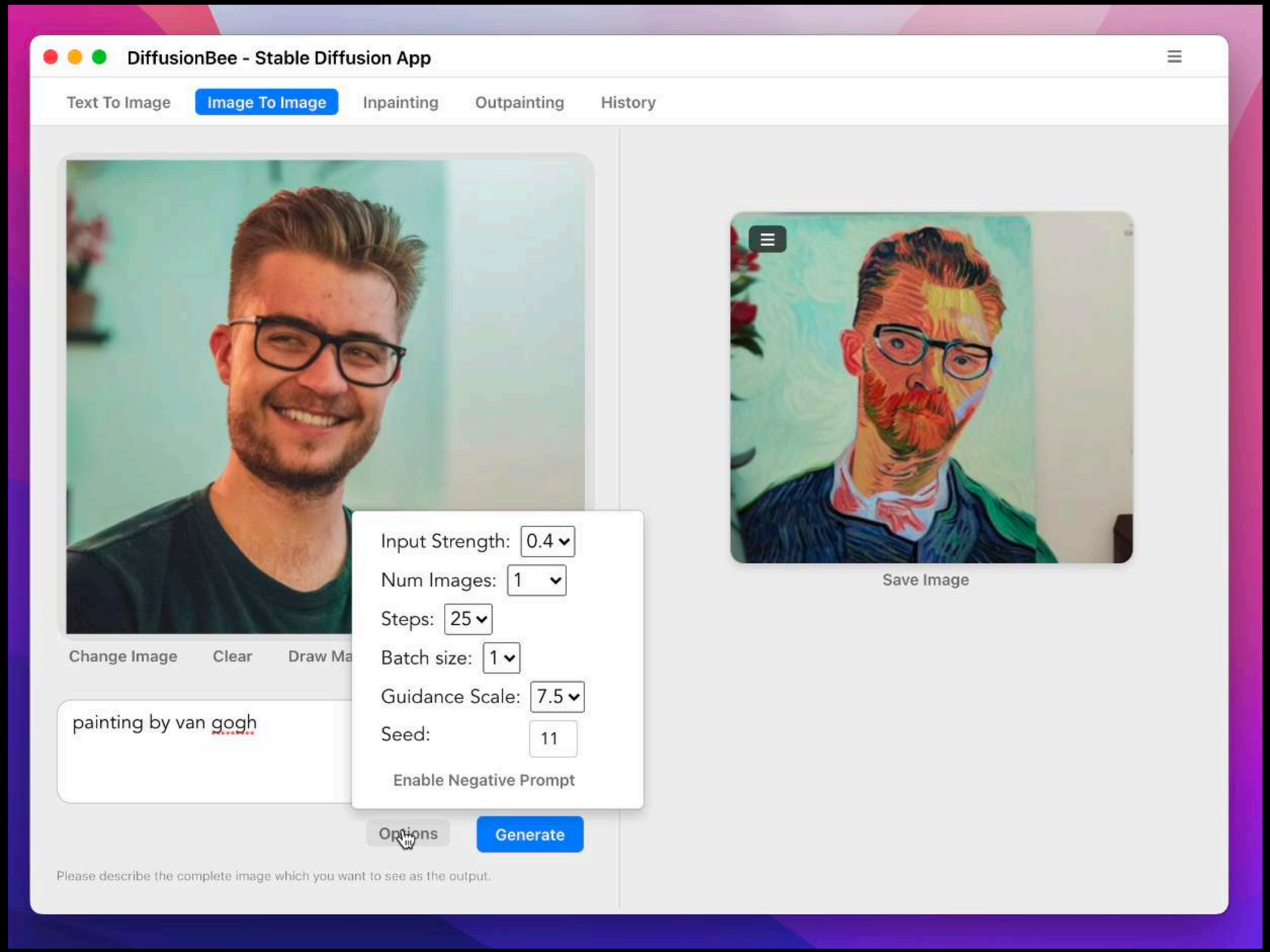

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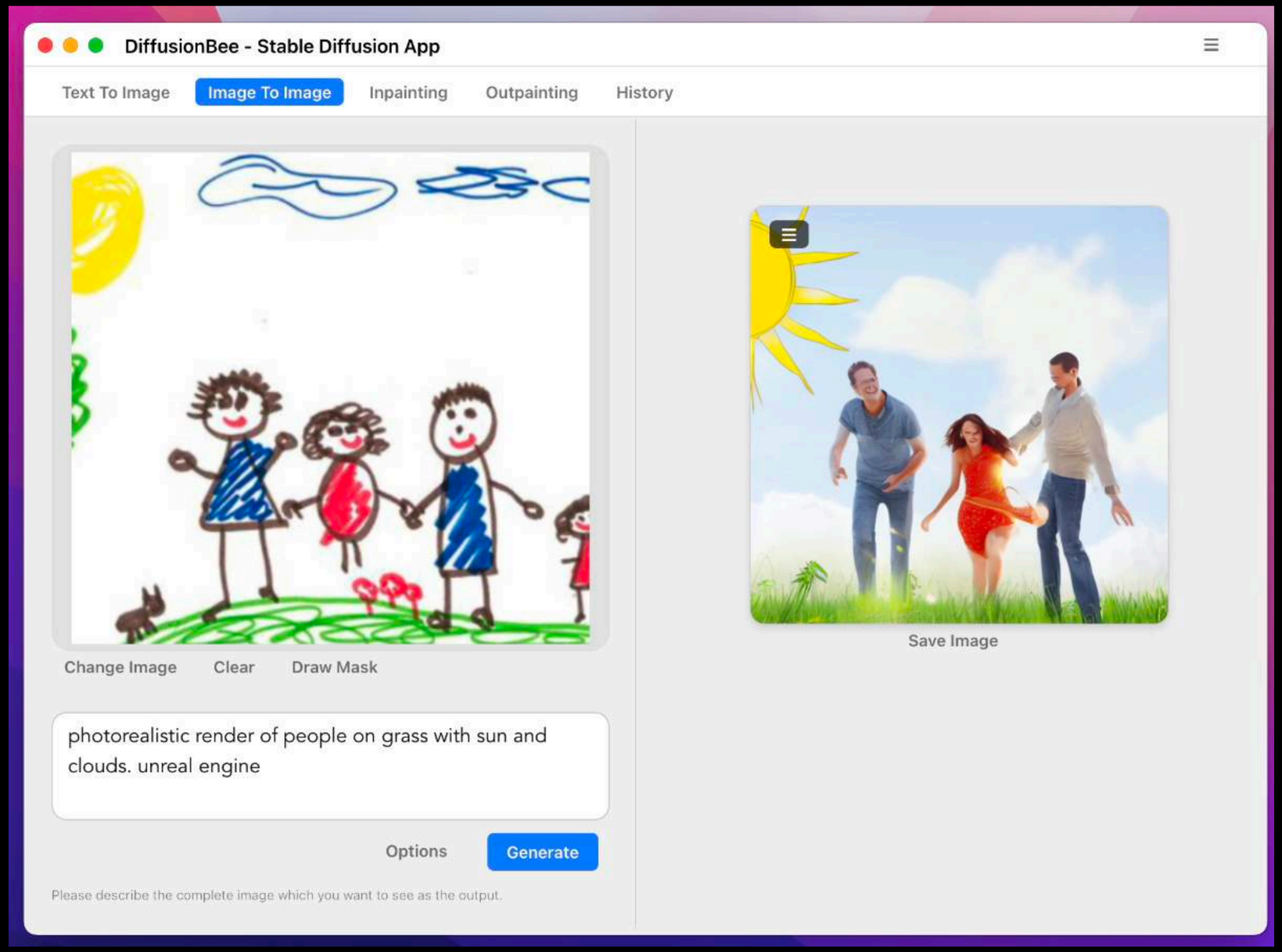
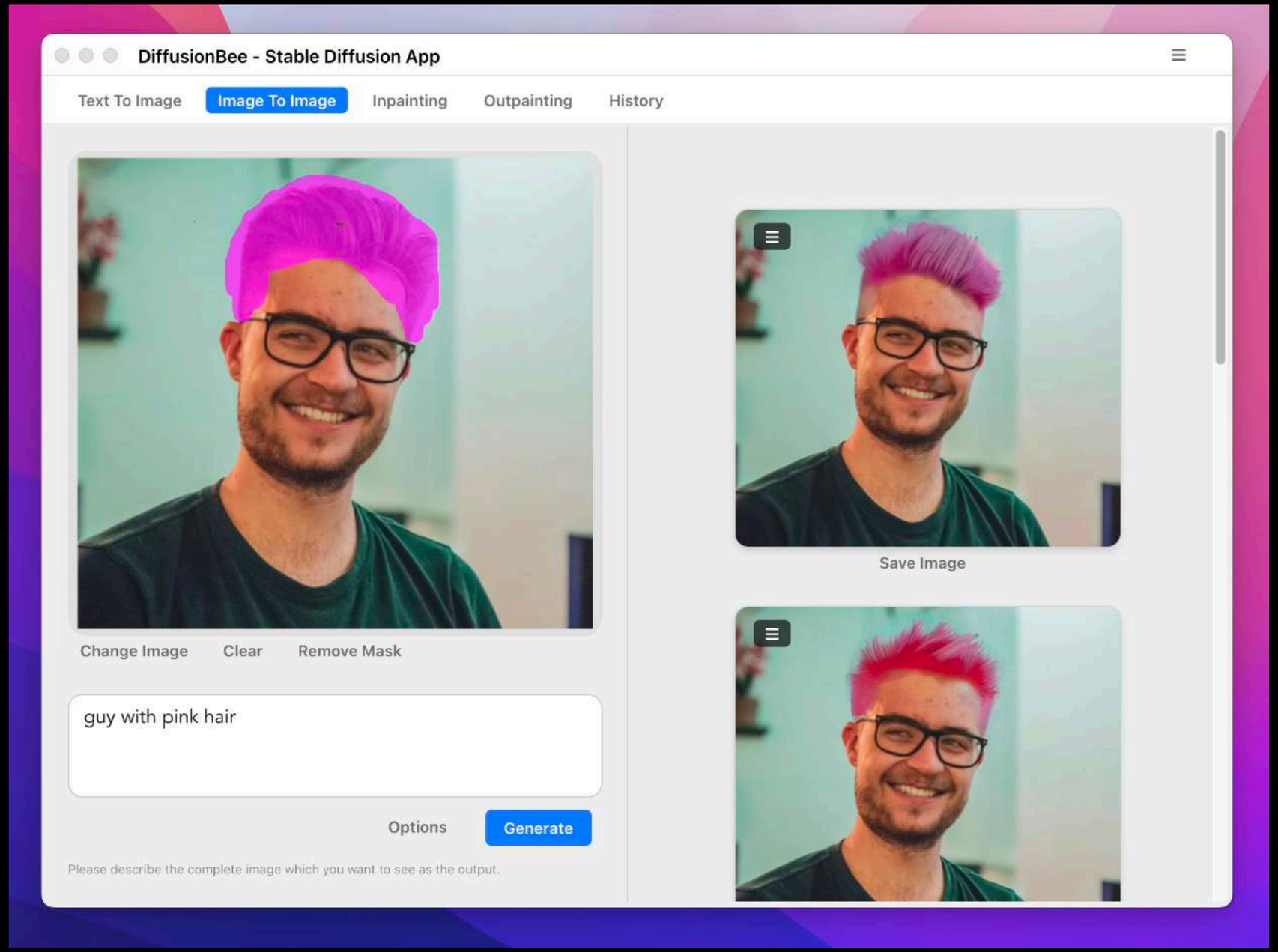
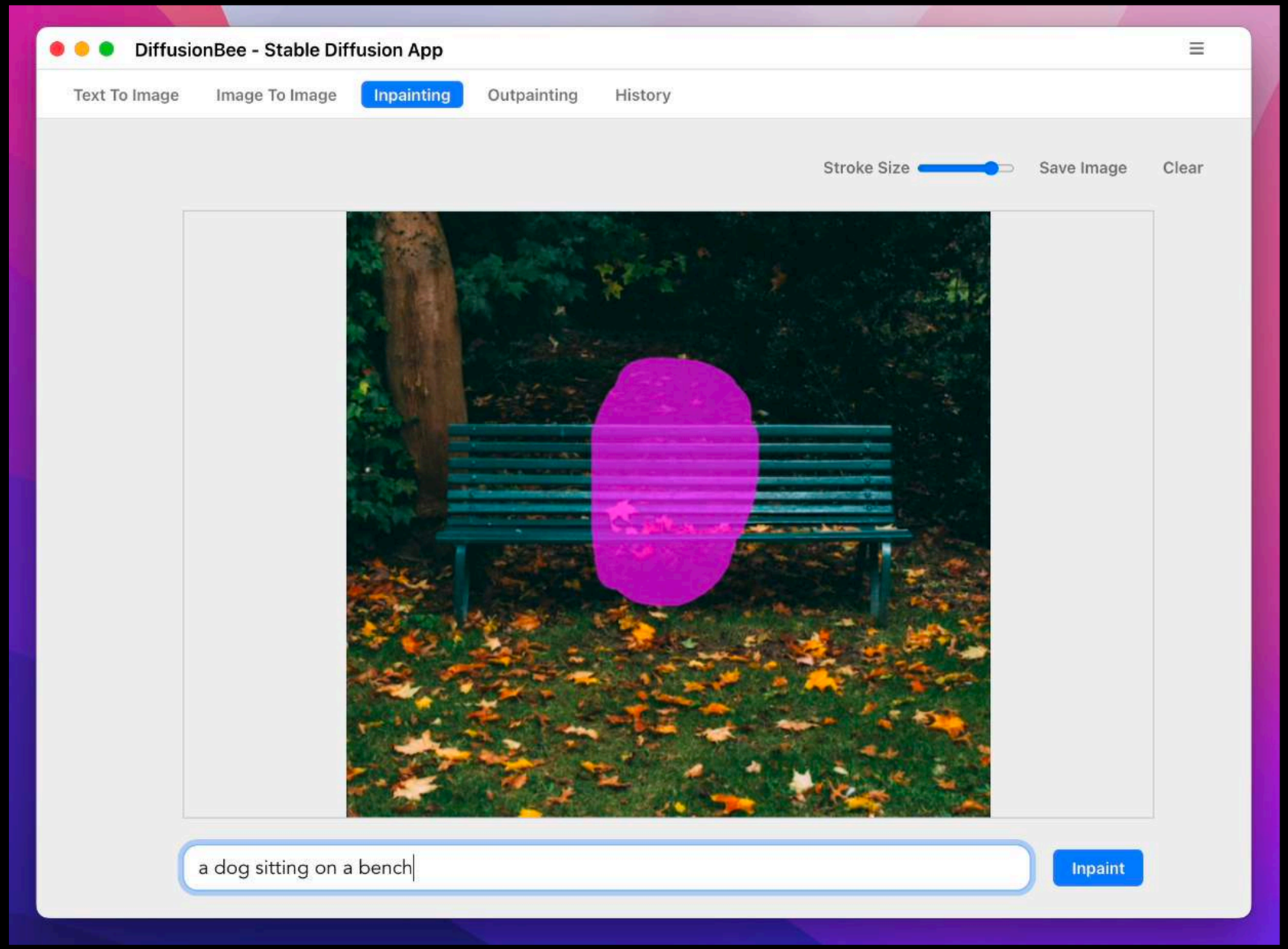


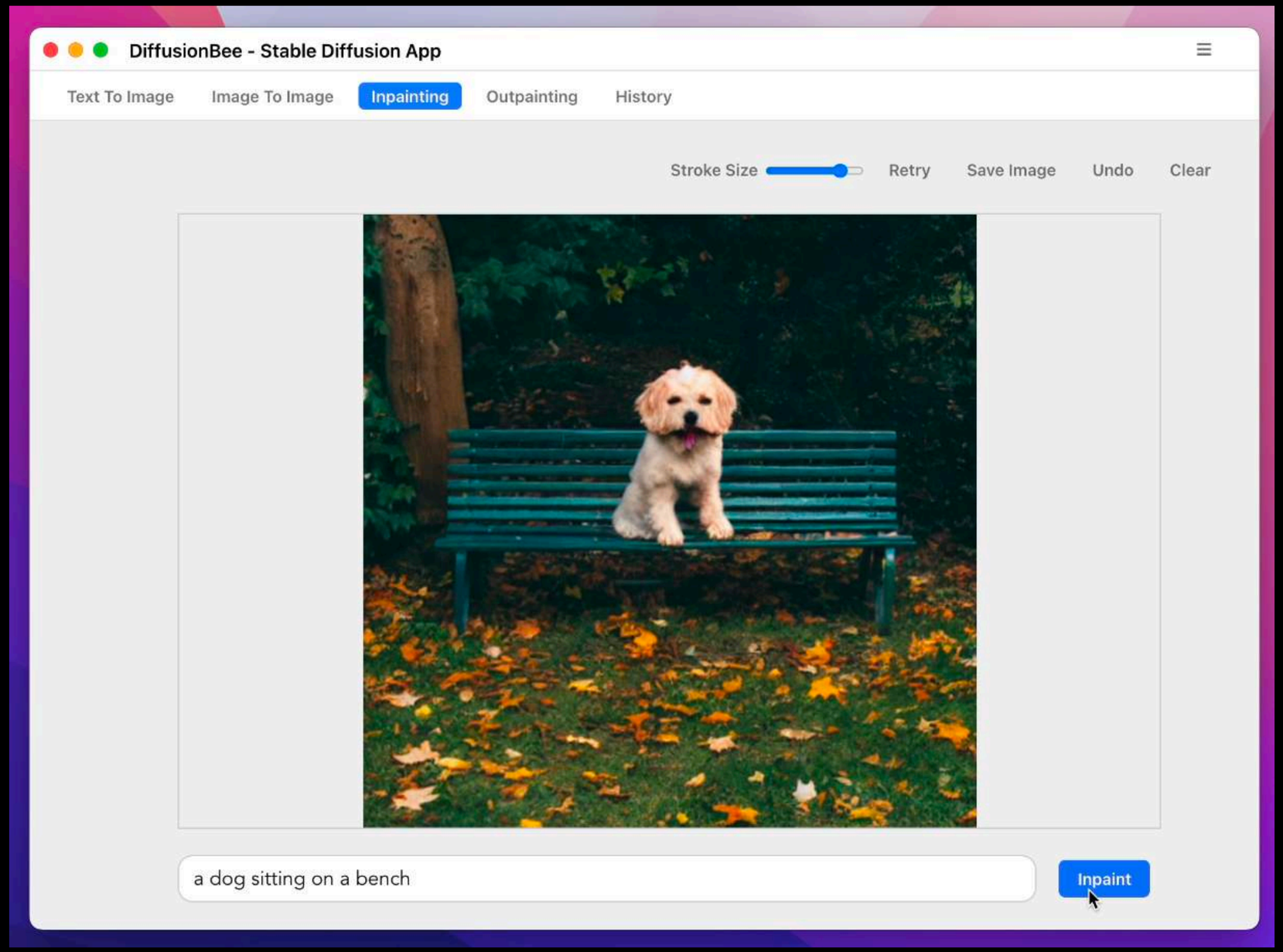
STABLE DIFFUSION - HOW DO YOU USE IT?



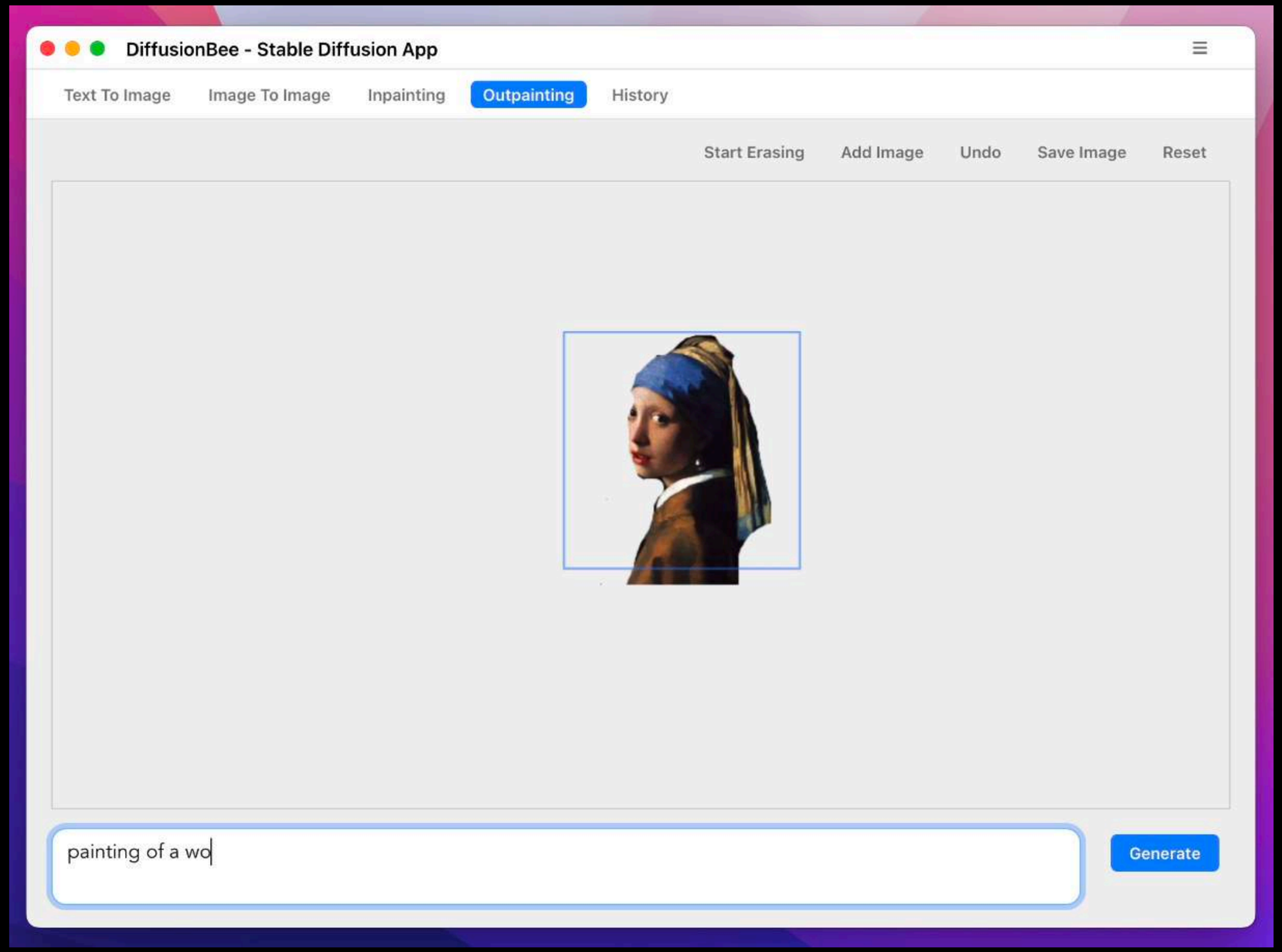
STABLE DIFFUSION - HOW DO YOU USE IT?



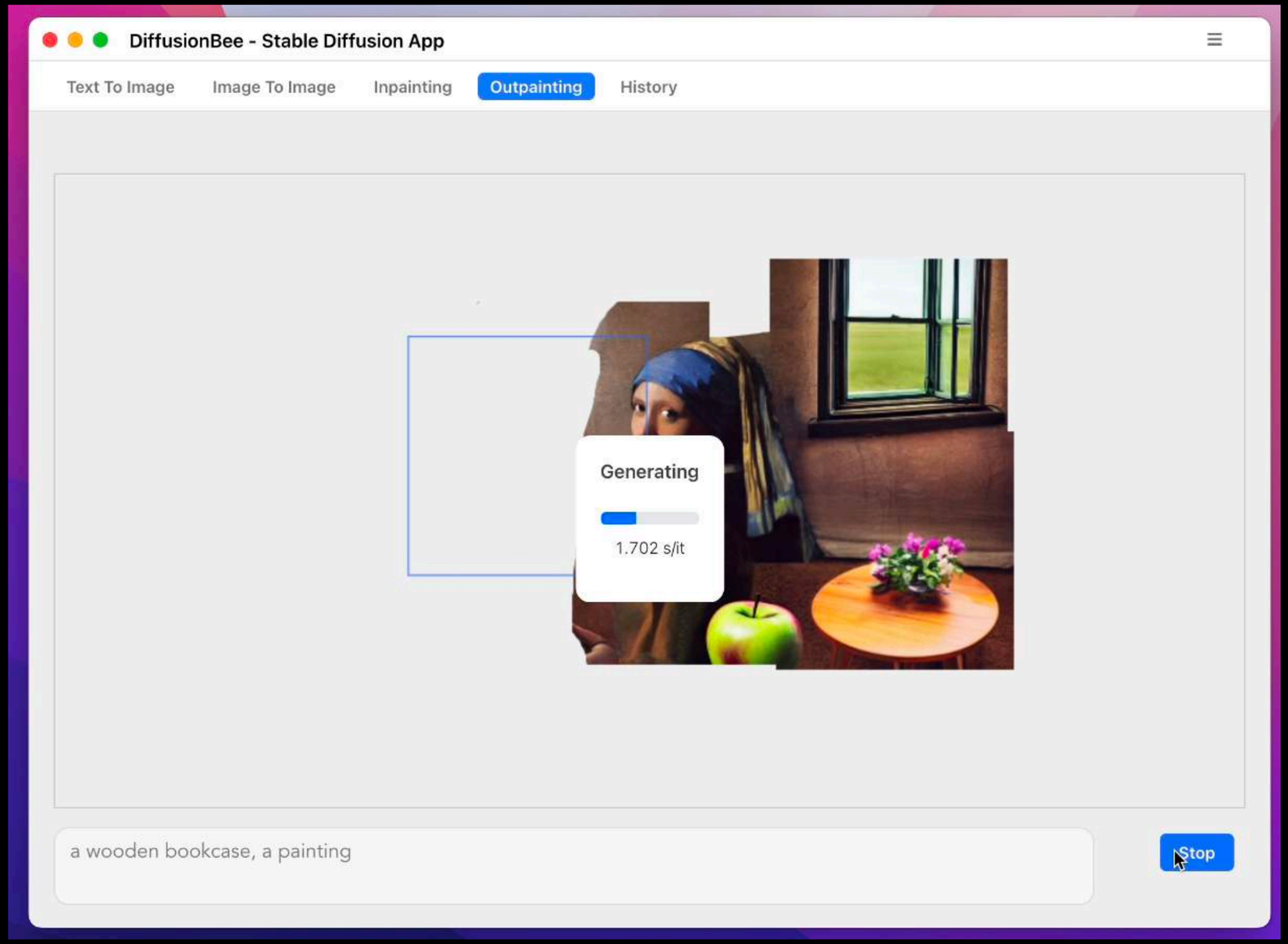
STABLE DIFFUSION - HOW DO YOU USE IT?



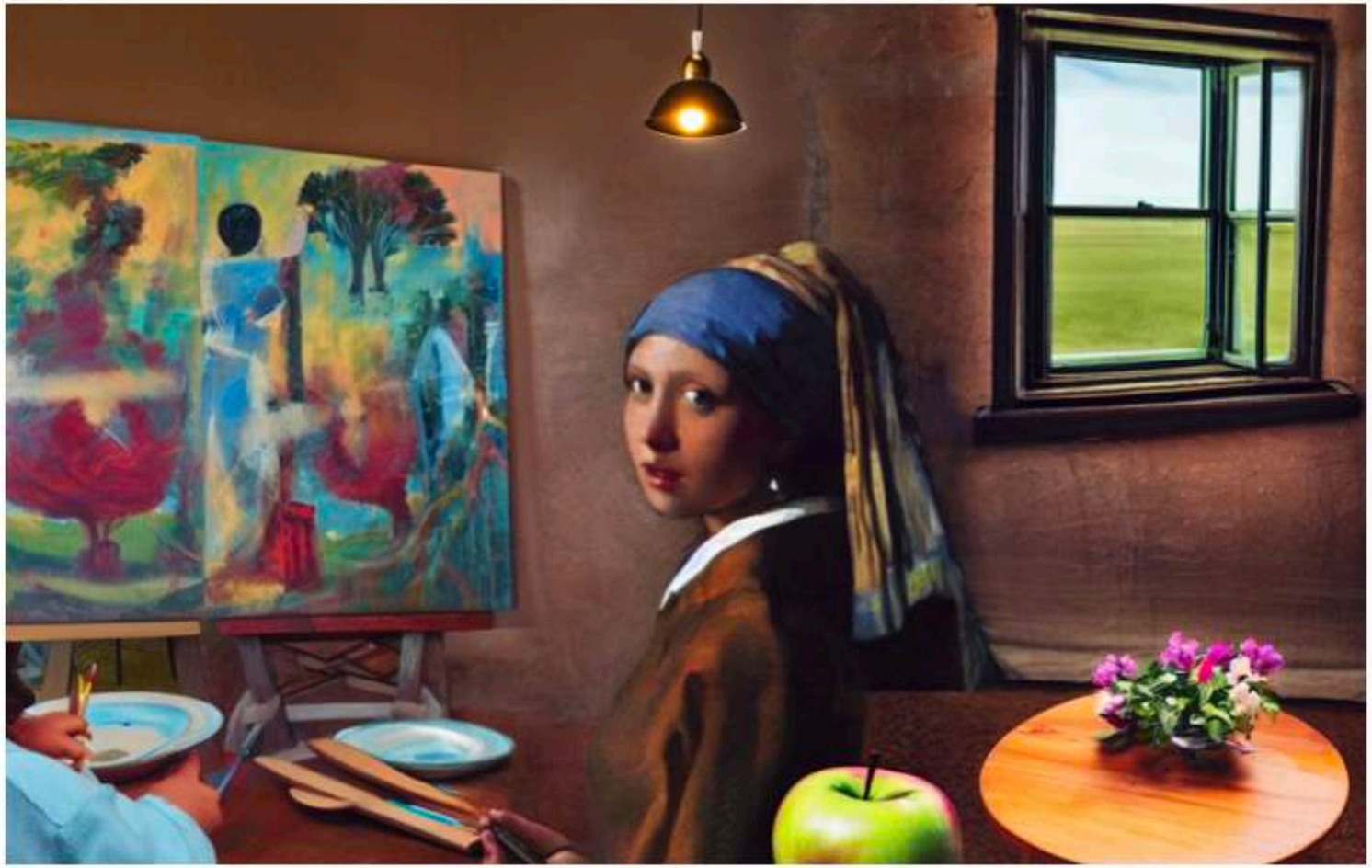
STABLE DIFFUSION - HOW DO YOU USE IT?



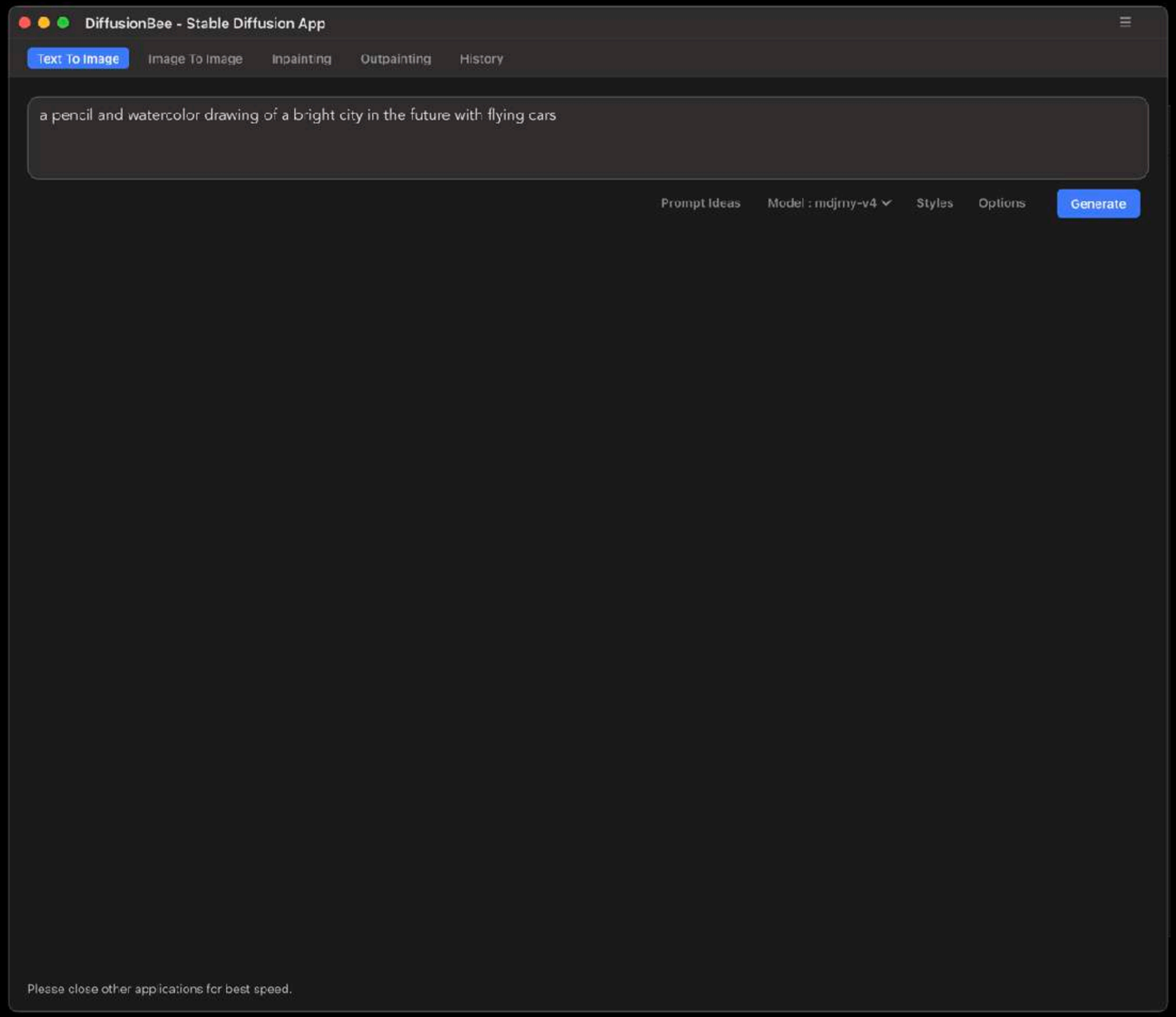
STABLE DIFFUSION - HOW DO YOU USE IT?



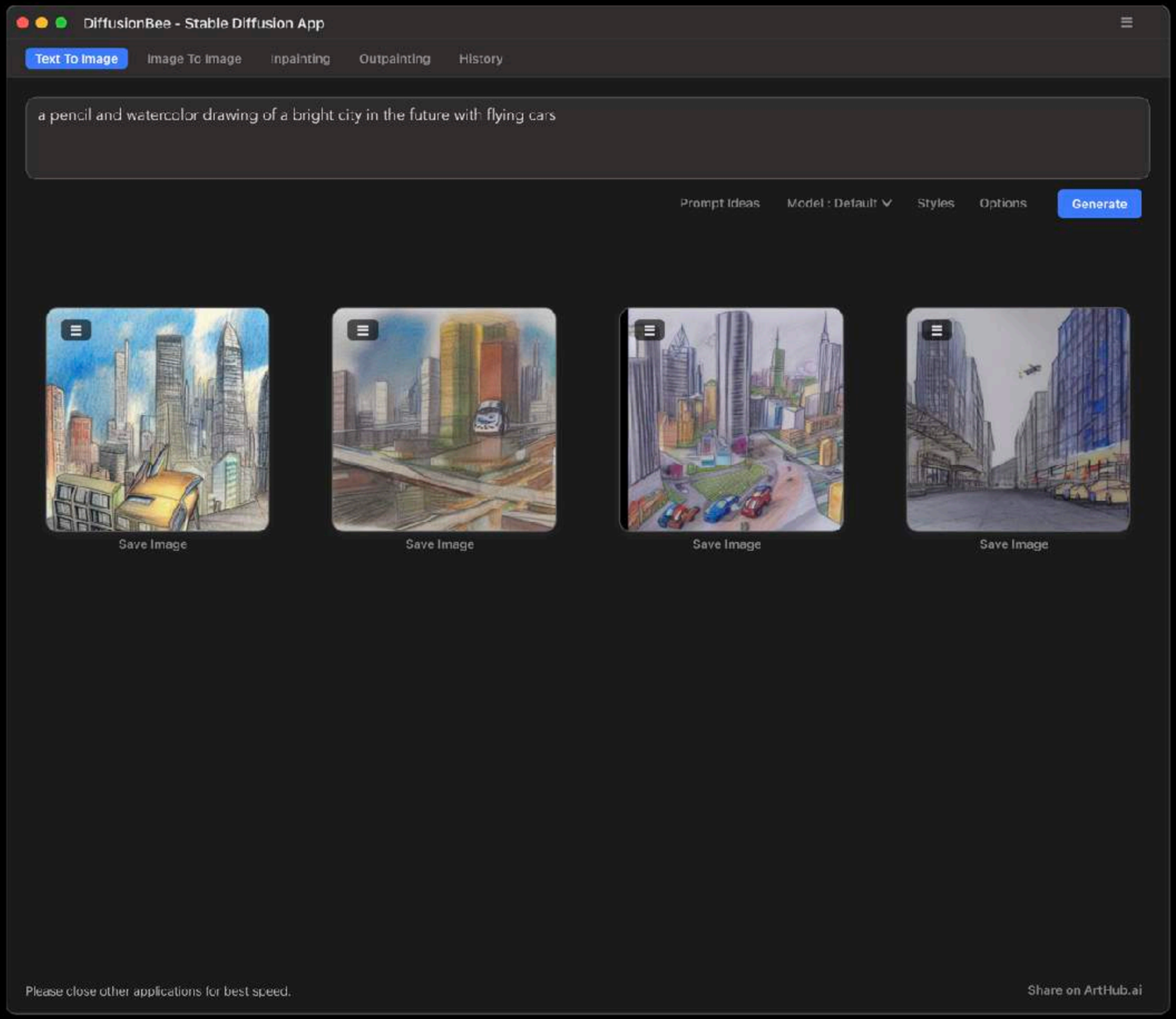
STABLE DIFFUSION - HOW DO YOU USE IT?



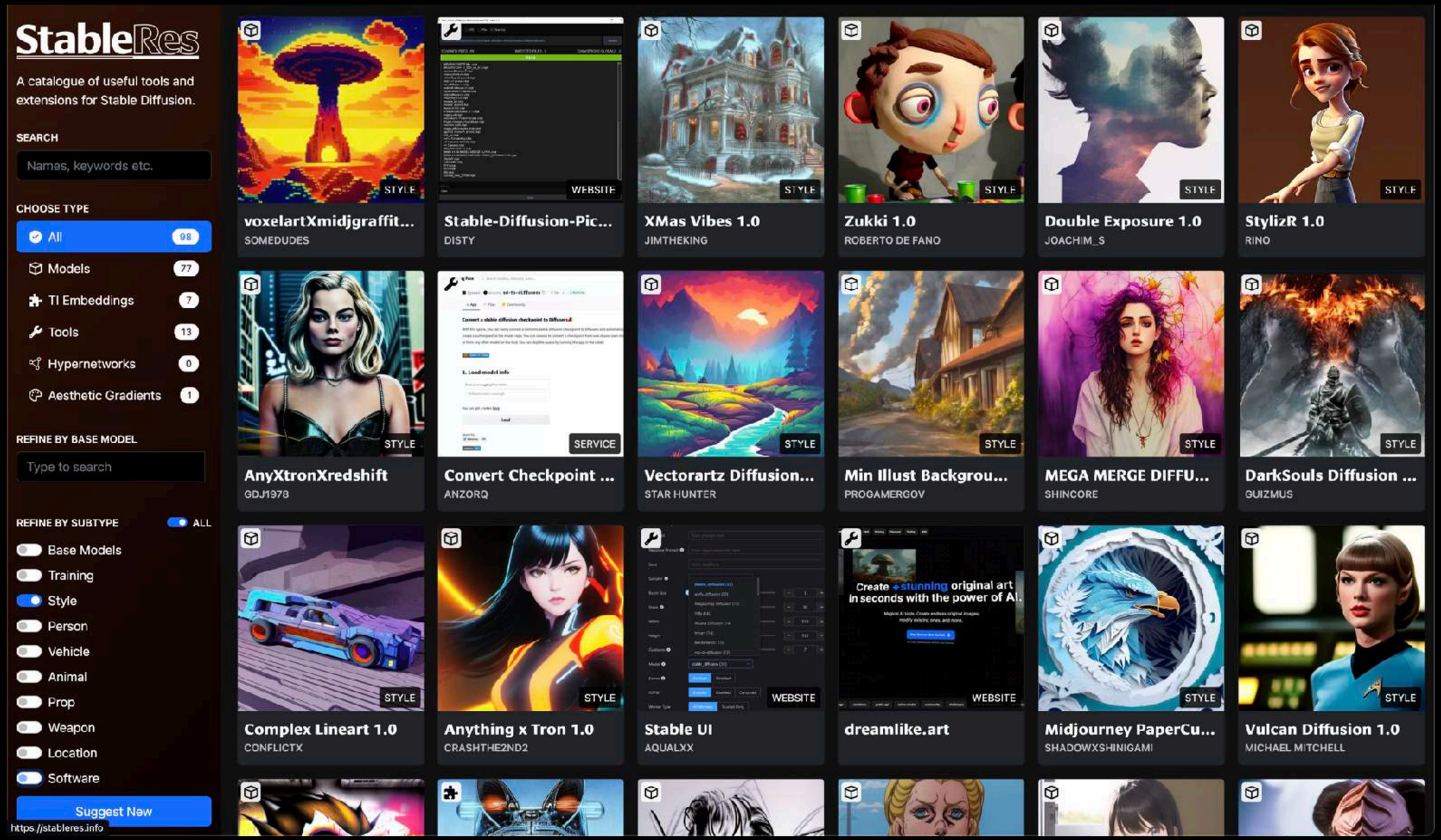
STABLE DIFFUSION - HOW DO YOU USE IT?



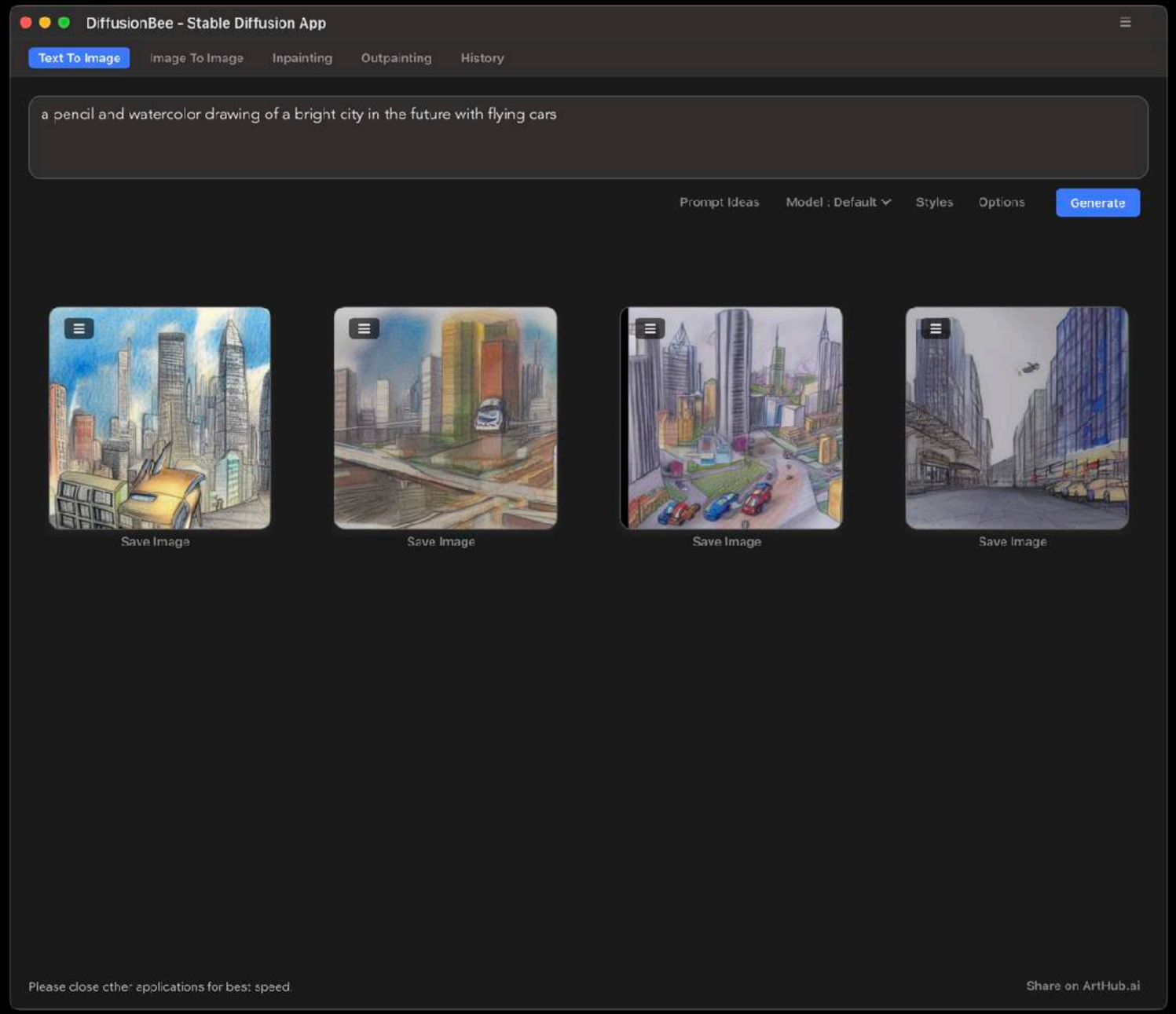
STABLE DIFFUSION - HOW DO YOU USE IT?



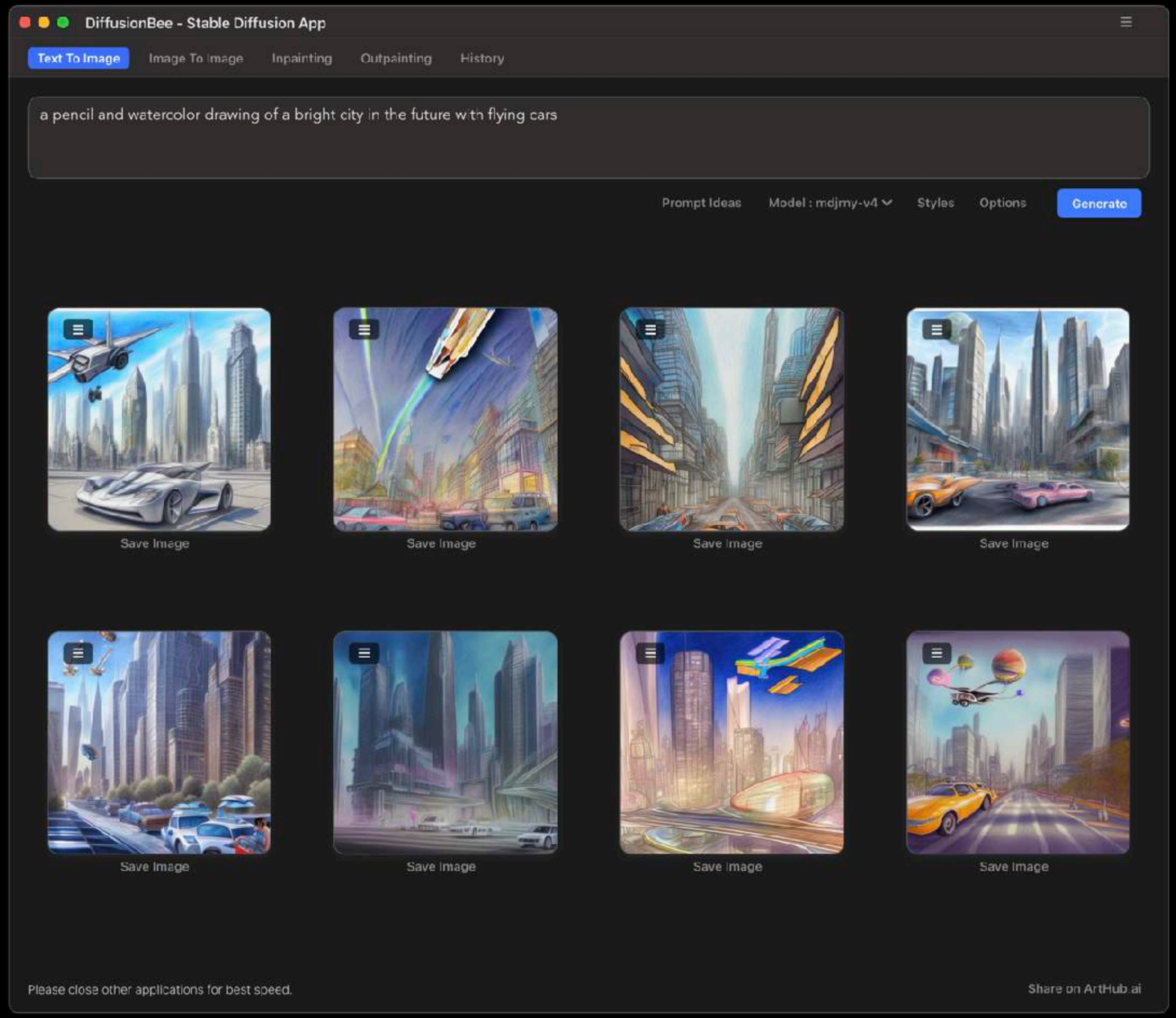
STABLE DIFFUSION - HOW DO YOU USE IT?



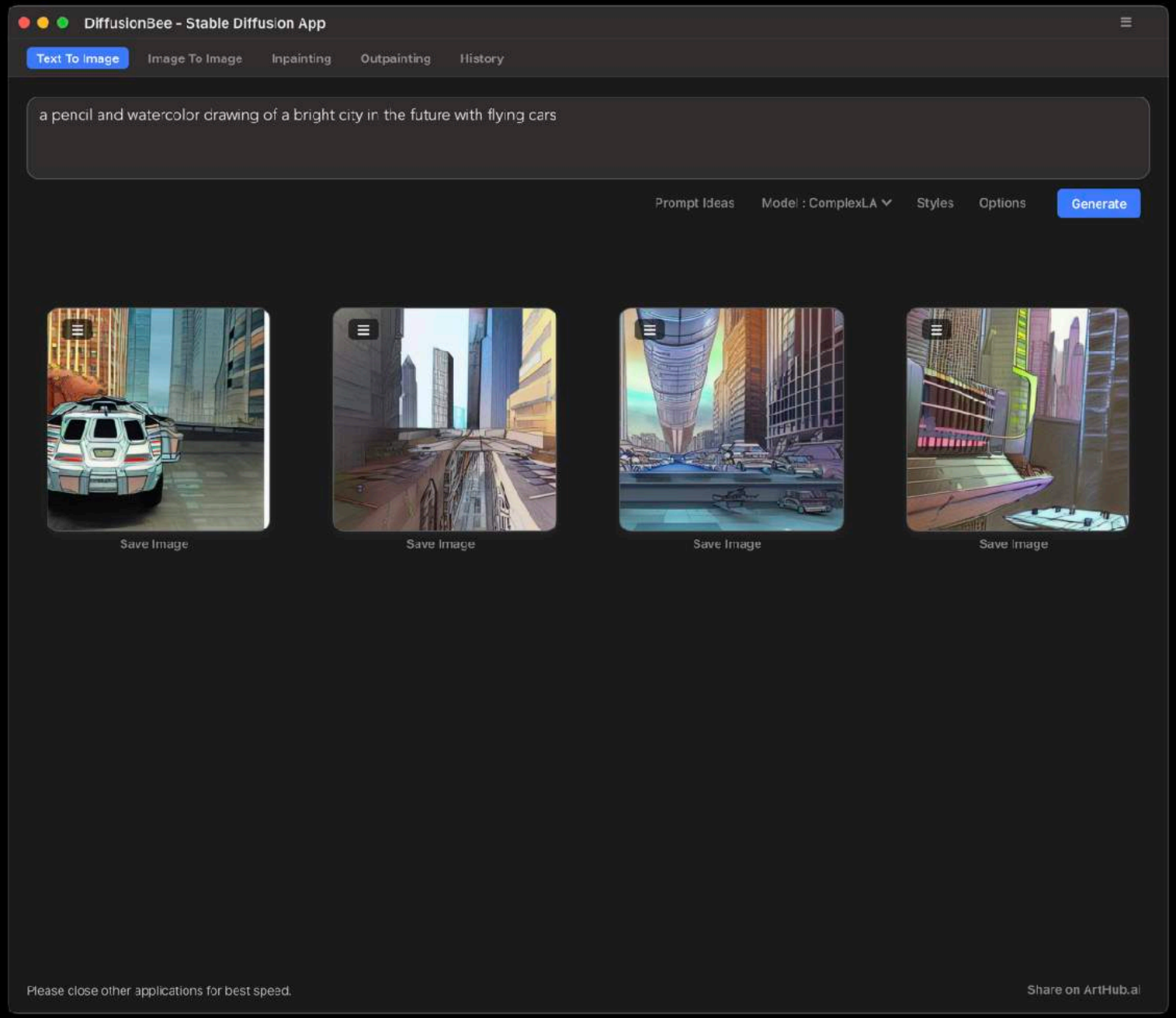
STABLE DIFFUSION - HOW DO YOU USE IT?



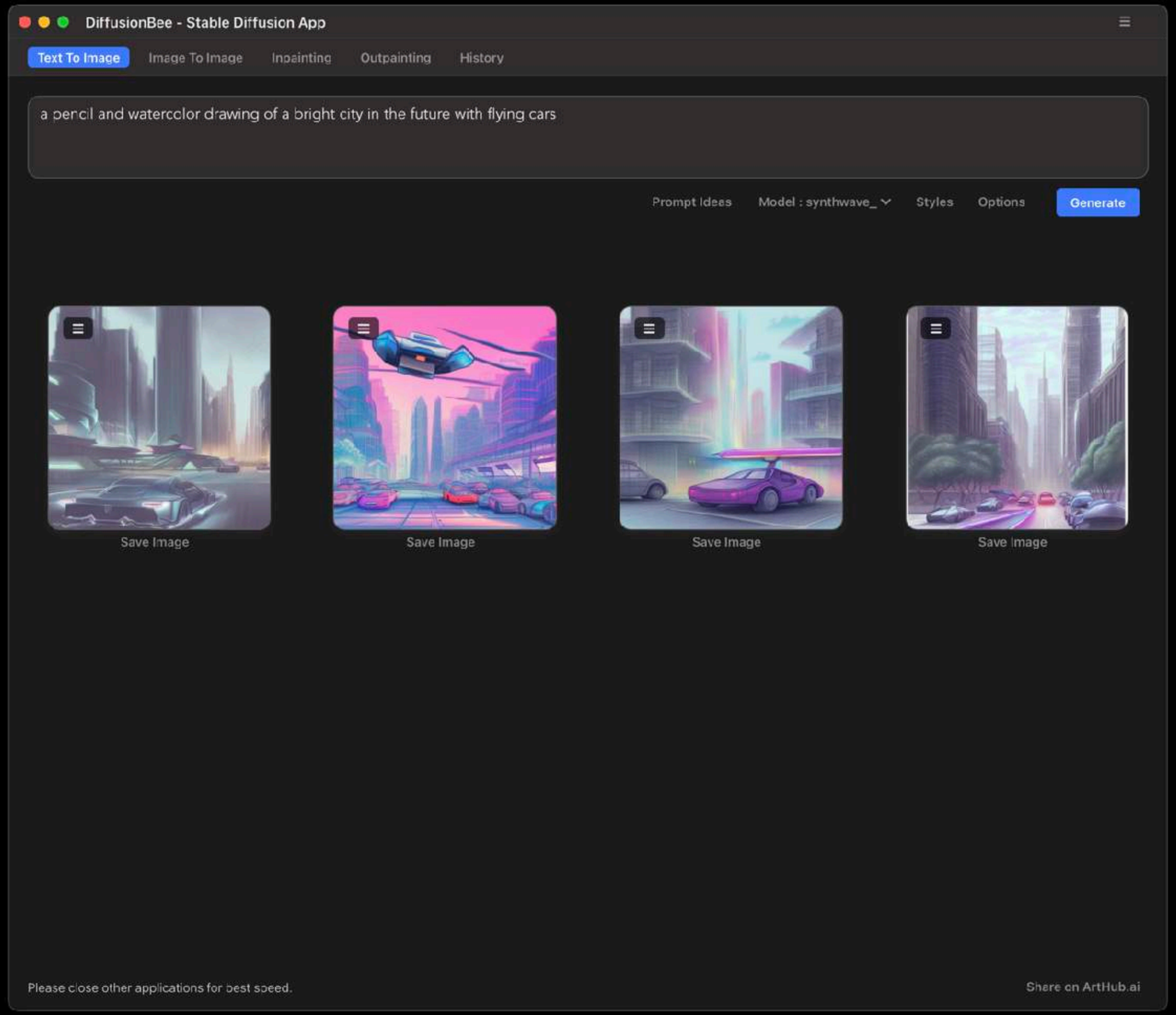
STABLE DIFFUSION - HOW DO YOU USE IT?



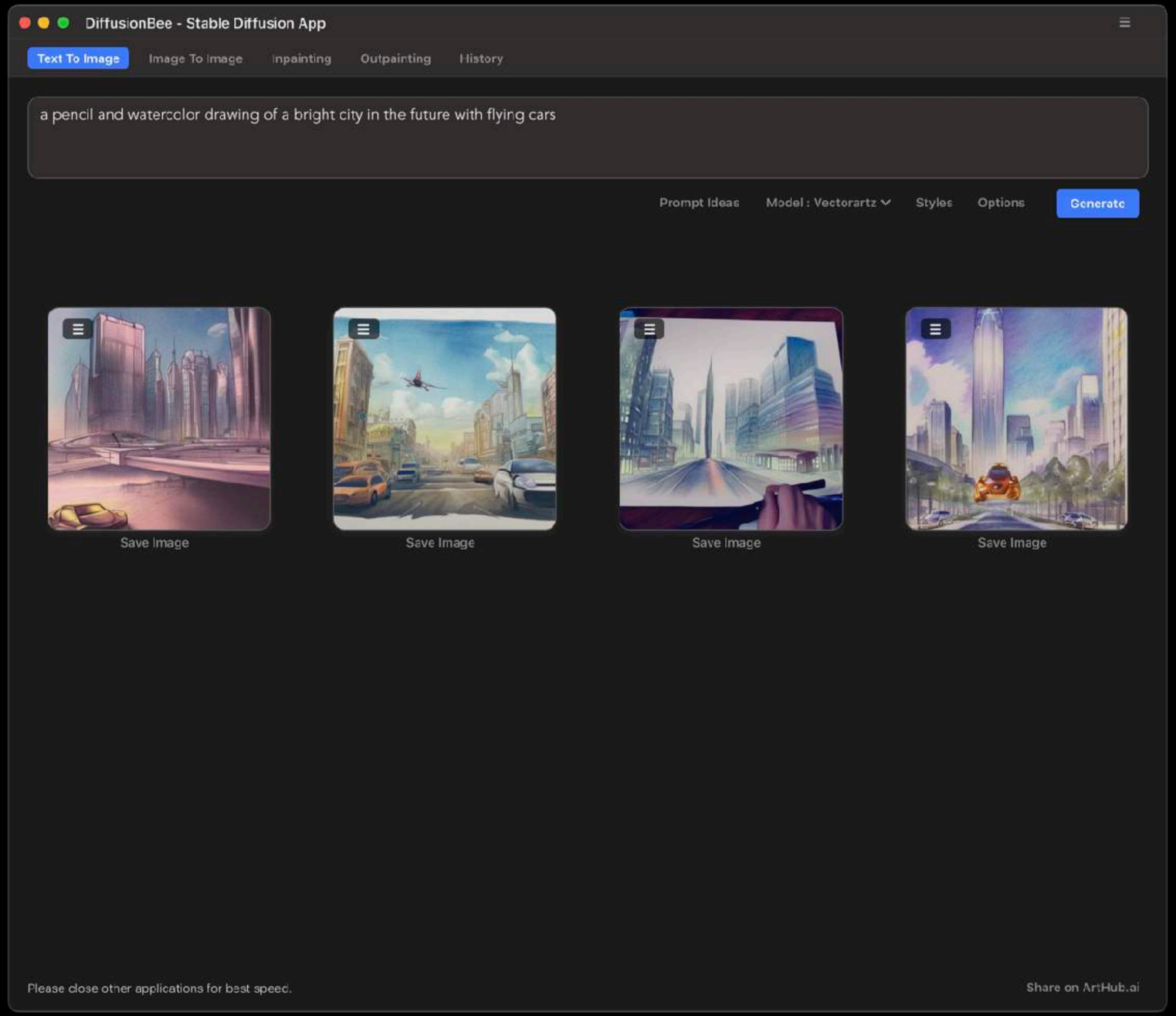
STABLE DIFFUSION - HOW DO YOU USE IT?



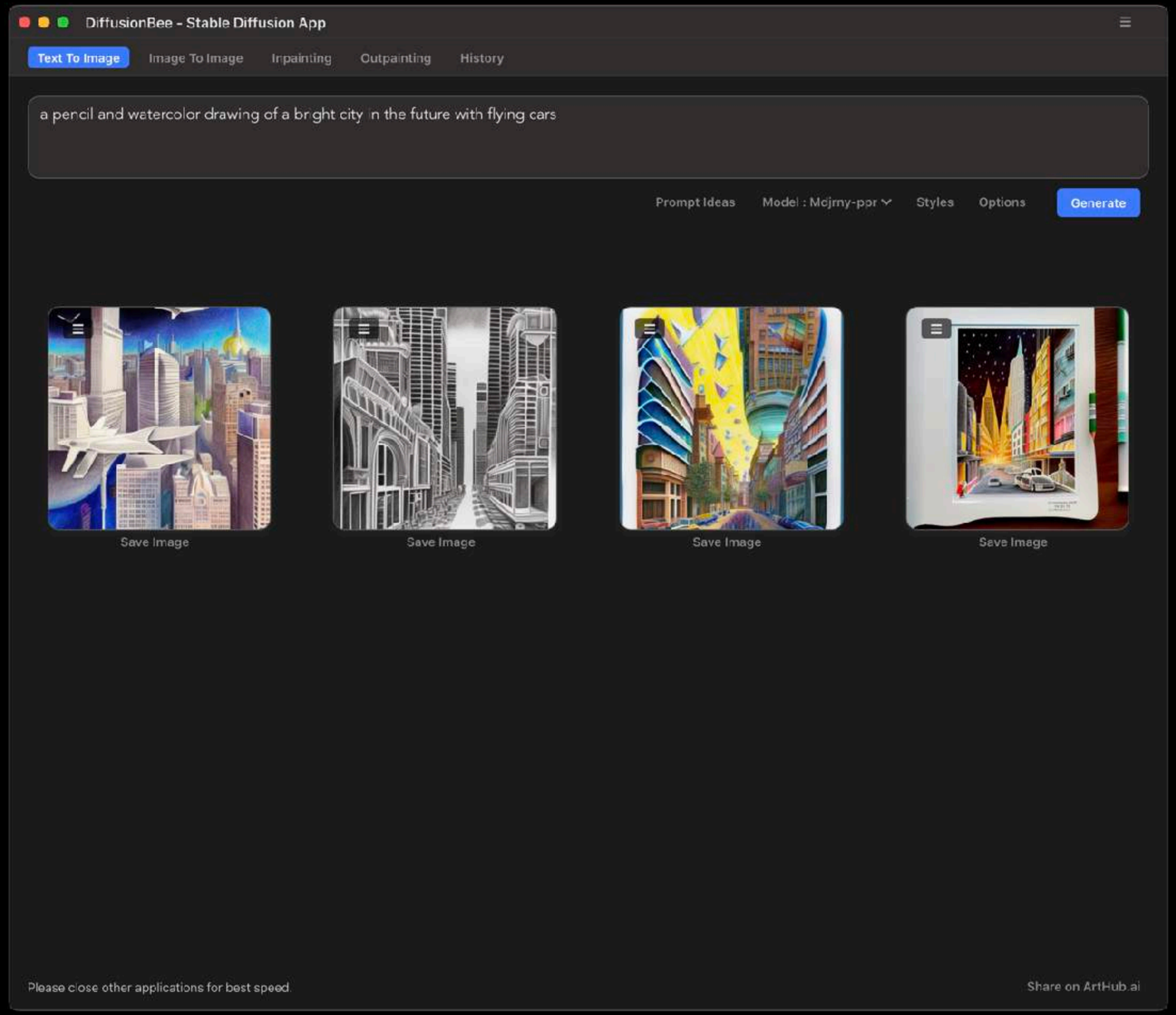
STABLE DIFFUSION - HOW DO YOU USE IT?



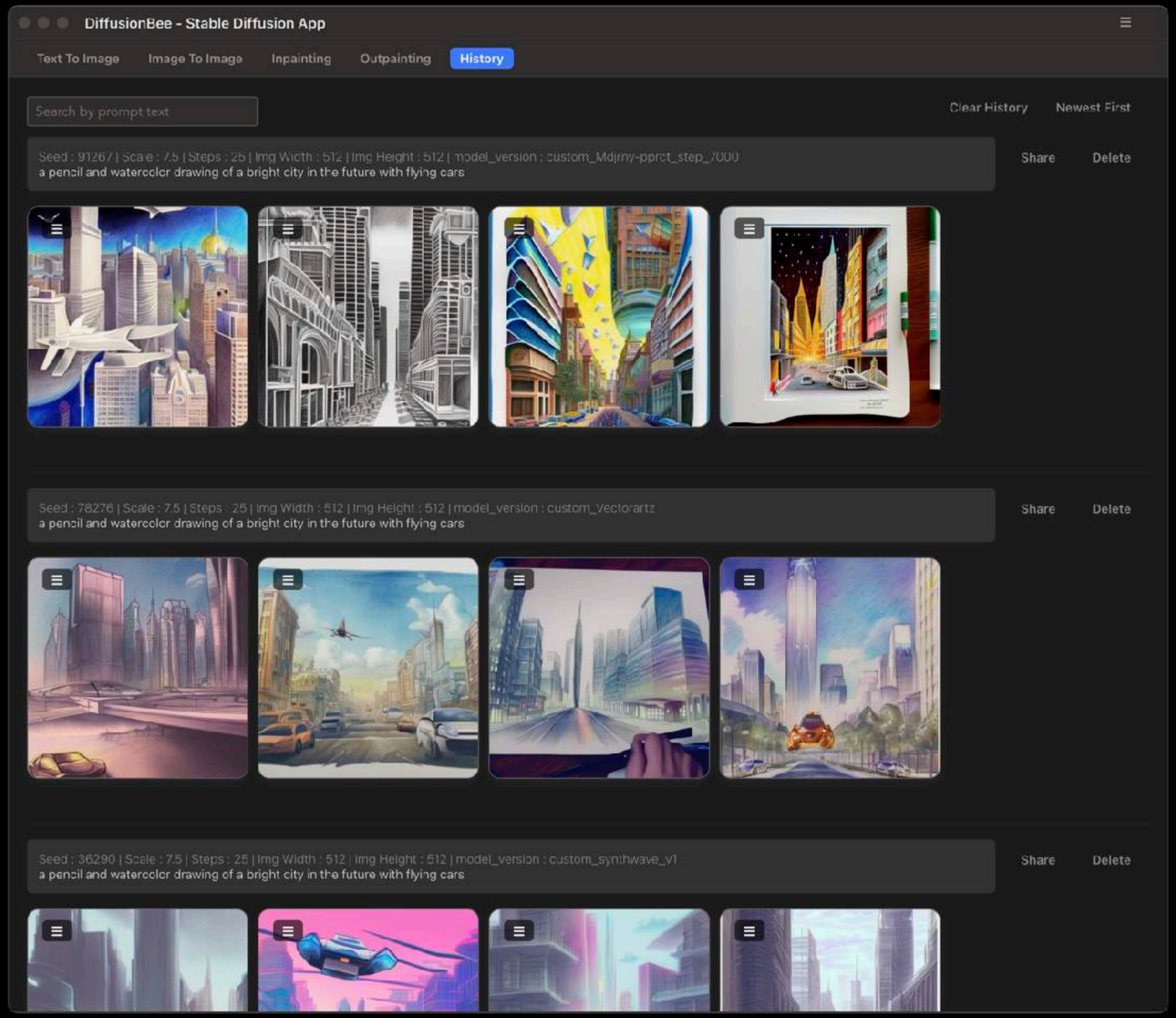
STABLE DIFFUSION - HOW DO YOU USE IT?



STABLE DIFFUSION - HOW DO YOU USE IT?



STABLE DIFFUSION - HOW DO YOU USE IT?



STABLE DIFFUSION - HOW DO YOU USE IT?

https://github.com/godly-devotion/MochiDiffusion/releases

last week

godly-devotion

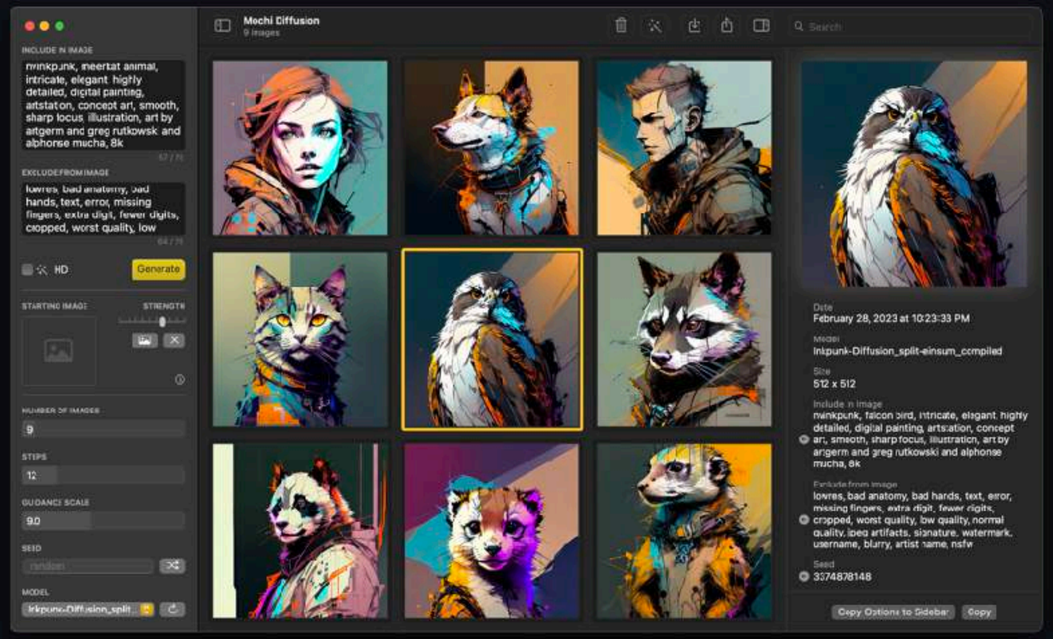
v3.0

296758e

Compare

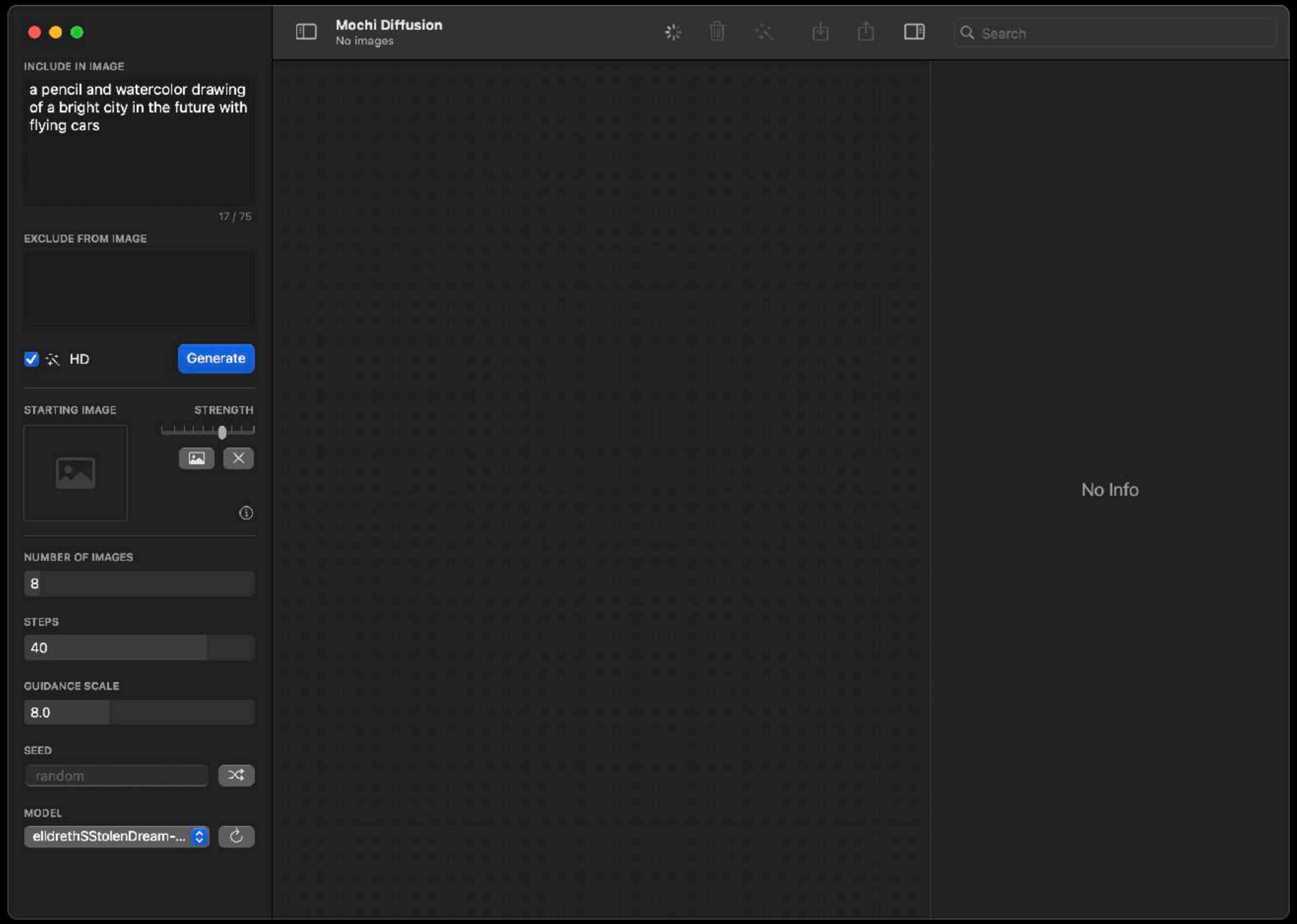
Bubble Tea Mochi

Latest



- Added option to select a starting image (commonly known as Image2Image)
  - Model must have `VAEEncoder.mlmodelc` file
  - Starting image and model must be 512x512 in size
- Added Dutch translation (Richard Venneman)
- Added setting to change default save image type
- Added support for importing and saving HEIC images
  - HEIC images are so small and efficient that it only uses about 5% of the file size of upscaled PNG images 🤩
- Added link to project translation website (Help > Contribute Translation)
- Updated sidebar UI
- Removed focus from text fields if image is clicked to avoid accidentally changing text
- General performance improvements

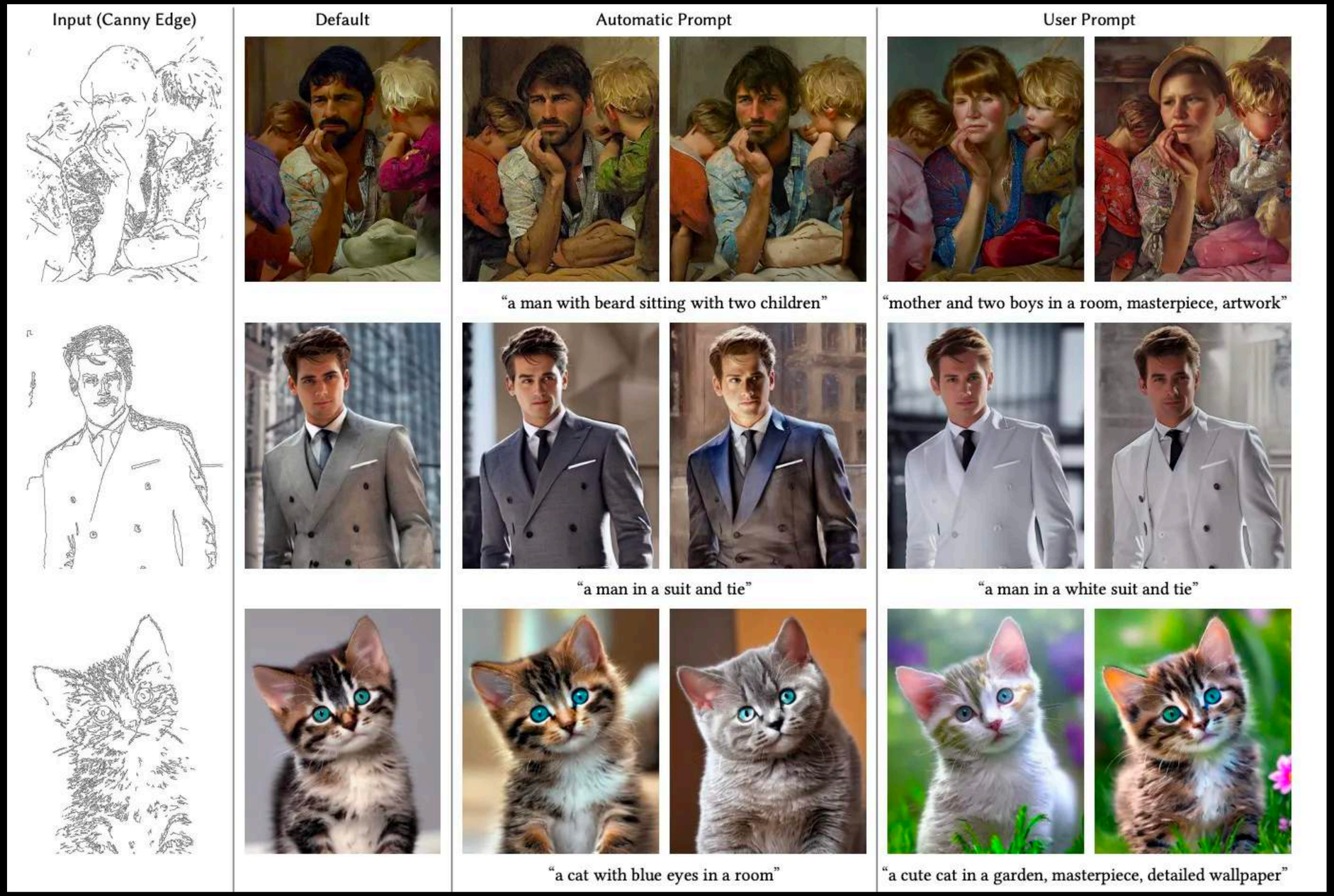
STABLE DIFFUSION - HOW DO YOU USE IT?



STABLE DIFFUSION - HOW DO YOU USE IT?

STABLE DIFFUSION - WHAT'S NEXT?

- ControlNET

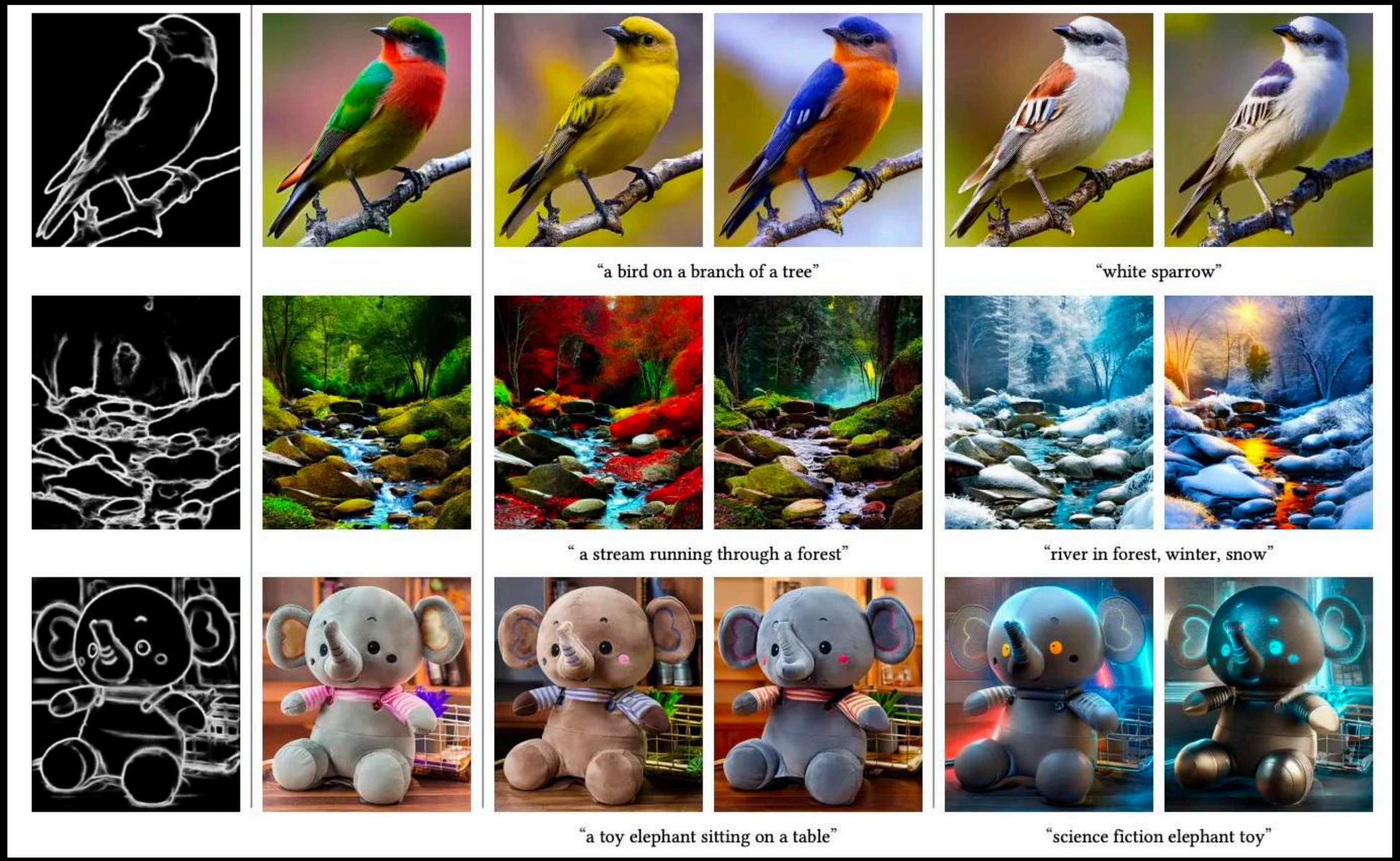


STABLE DIFFUSION - WHAT'S NEXT?

- ControlNET

STABLE DIFFUSION - WHAT'S NEXT?

- ControlNET



STABLE DIFFUSION - WHAT'S NEXT?

- ControlNET

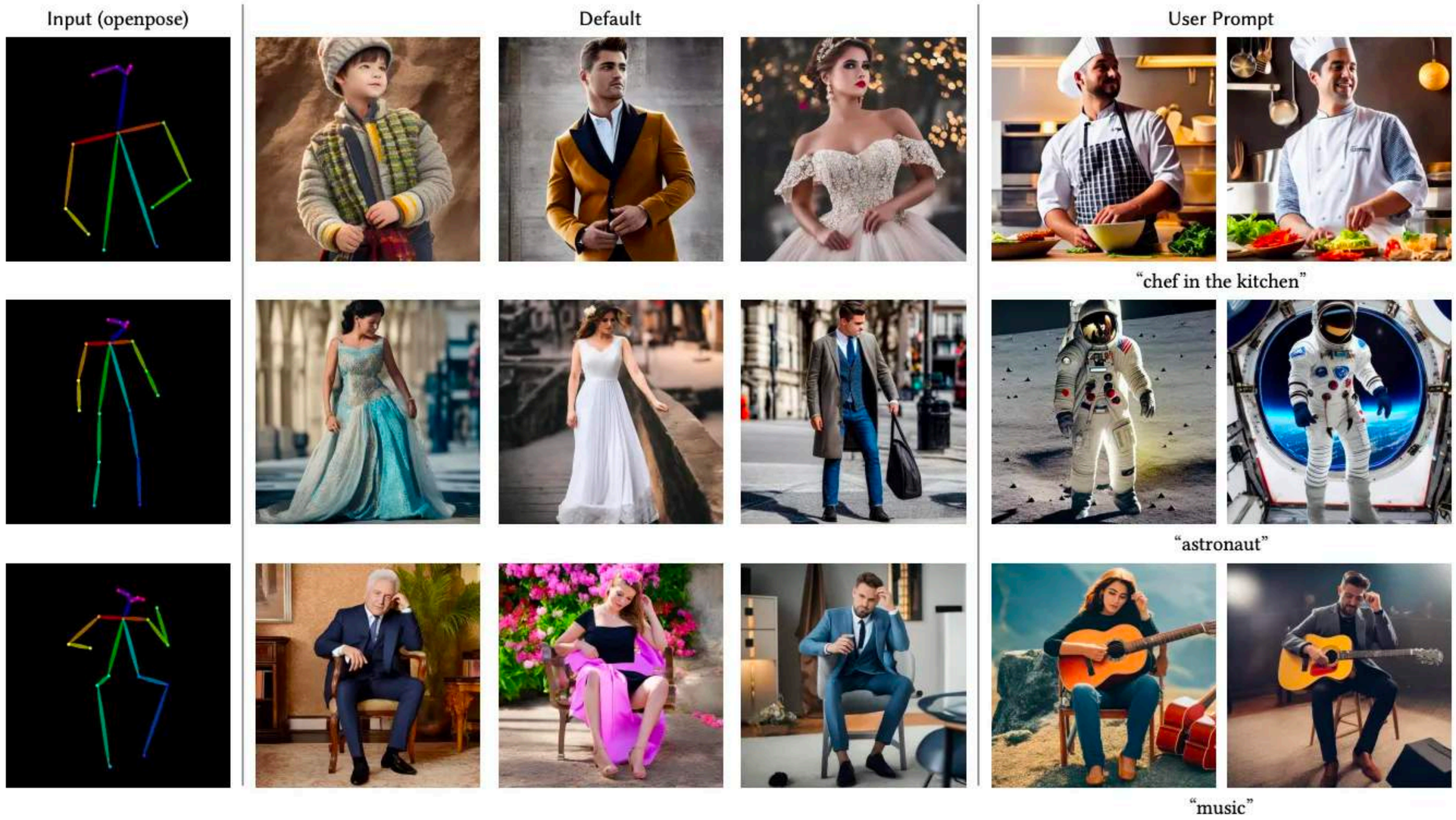
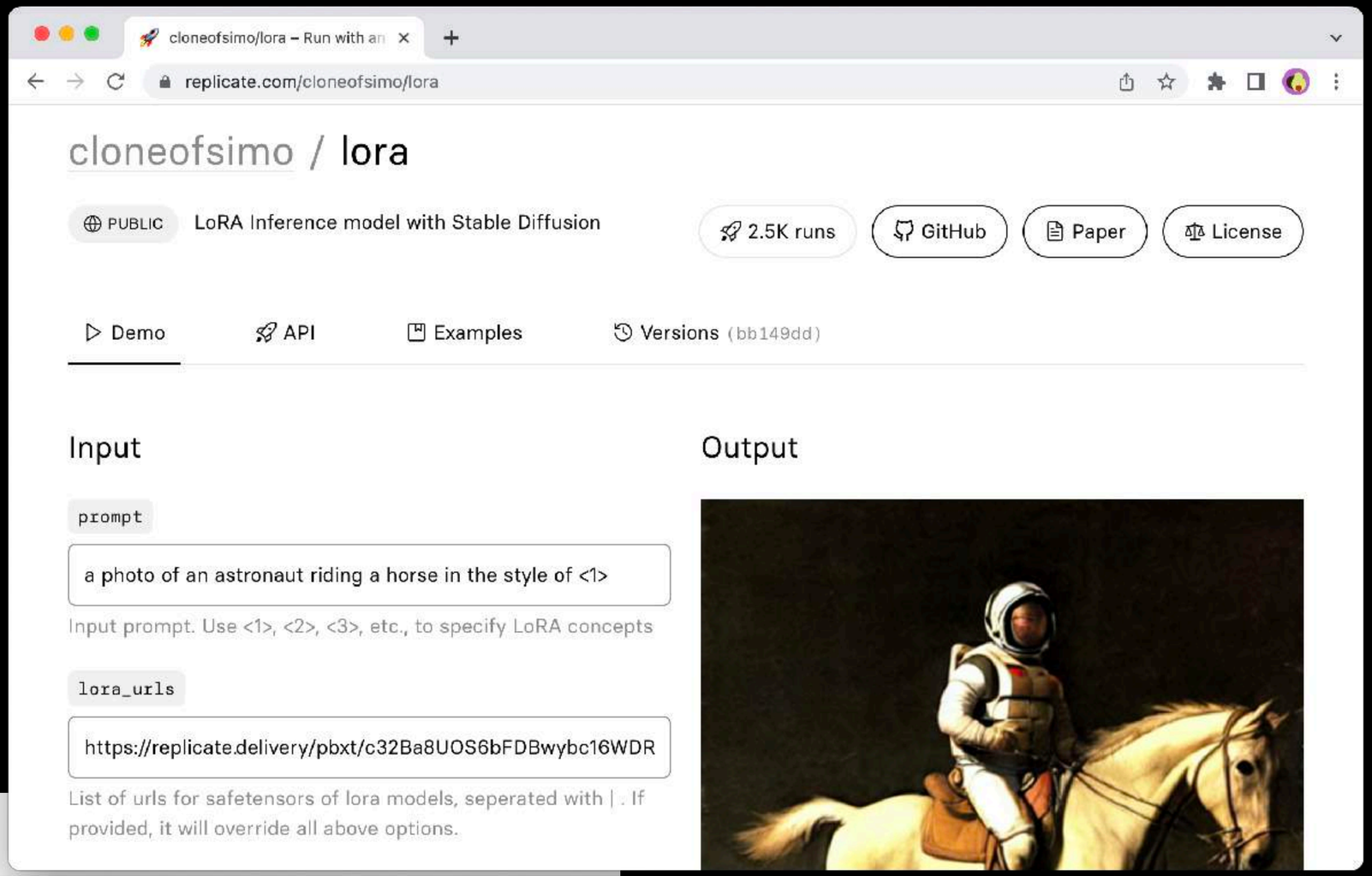
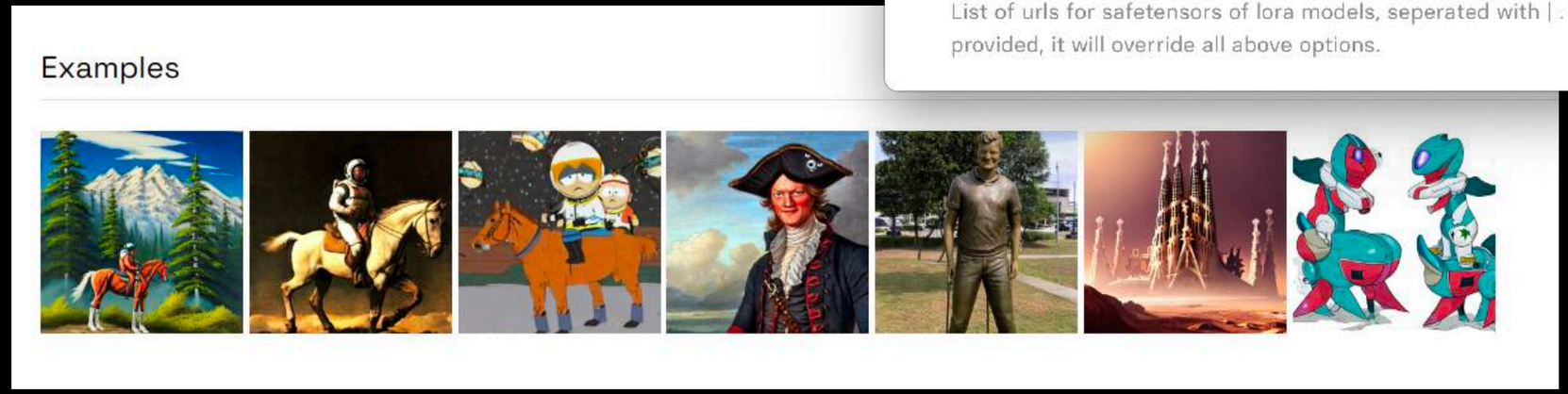


Figure 9: Controlling Stable Diffusion with Openpose. See also the Appendix for source images for Openpose pose detection.

STABLE DIFFUSION - WHAT'S NEXT?

- **LORA** stands for Large-scale Open-domain Realistic Artwork, a collection of diffusion models that are fine-tuned using Low-Rank Adaptation (**LoRA**).





WHICH ONE IS THE BEST?

Which one do you think is better?

I don't have a subjective opinion on which one is better, as they all have their strengths and weaknesses. It depends on what kind of images you want to generate and for what purpose. In this context, a human might say that DALL-E 2 is better for realistic and detailed images, Midjourney is better for artistic and creative images, and Stable Diffusion is better for open-source and accessible images.

3 of 10

WHICH ONE IS THE BEST?

Sure, I can show you some examples of their outputs. Here are some images generated by DALL-E 2, Midjourney and Stable Diffusion for the same prompt: “A cat wearing a hat”.

DALL-E 2:

```
  /\_/\
=( °w° )=
  )   (  //
 (__ __)//
   / \
```

Midjourney:

```
  /\_/\
=( ^.^ )=
  ) > (  //
 (__ __)//
   / \
```

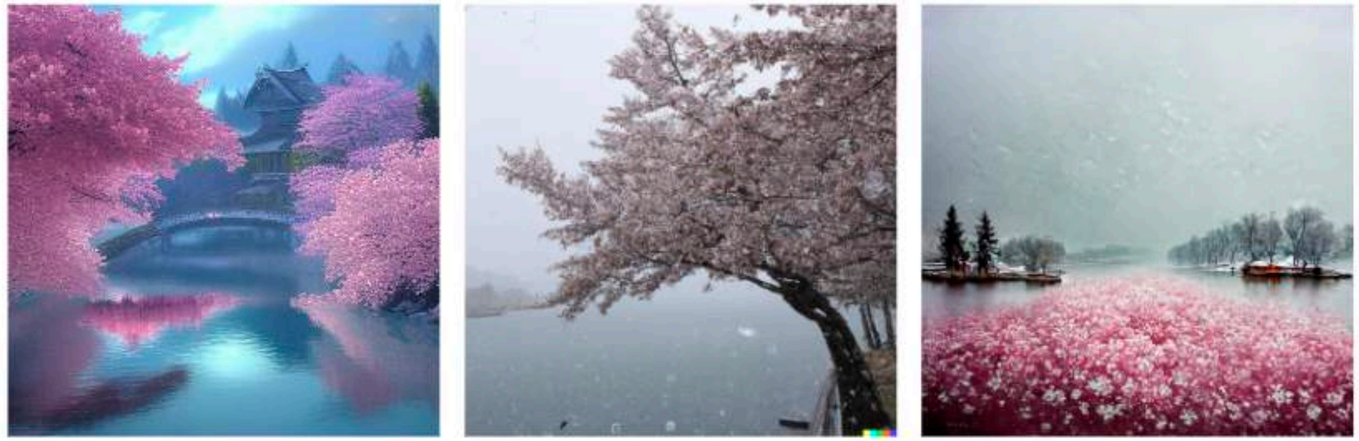
Stable Diffusion:

```
  /\_/\
=( 'o' )=
  ) v (  //
 (__ __)//
   / \
```

As you can see, DALL-E 2 produces a more realistic and detailed image, while Midjourney has a more artistic and stylized image. Stable Diffusion also creates a realistic image, but with less variation and quality than DALL-E 2.

WHICH ONE IS THE BEST?

Stable Diffusion **DALLE 2** **Midjourney**

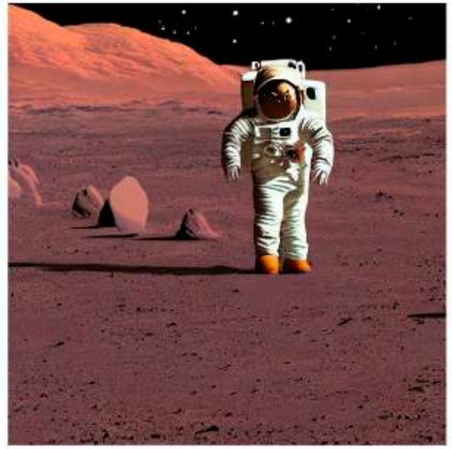


Cherry Blossom near a lake, snowing

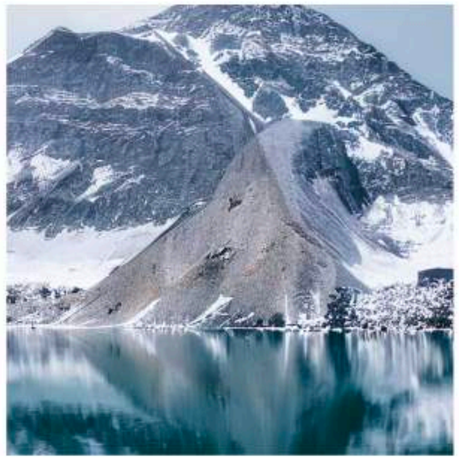
Stable Diffusion **DALLE 2** **Midjourney**

Dark alley at night 4k raining aesthetic

WHICH ONE IS THE BEST?

Stable Diffusion	DALLE 2	Midjourney
		

Alone astronaut on Mars, mysterious, colorful, hyper realistic

Stable Diffusion	DALLE 2	Midjourney
		

Pyramid shaped mountain above a still lake, covered with snow

ALTERNATIVES: GOOGLE'S IMAGEN

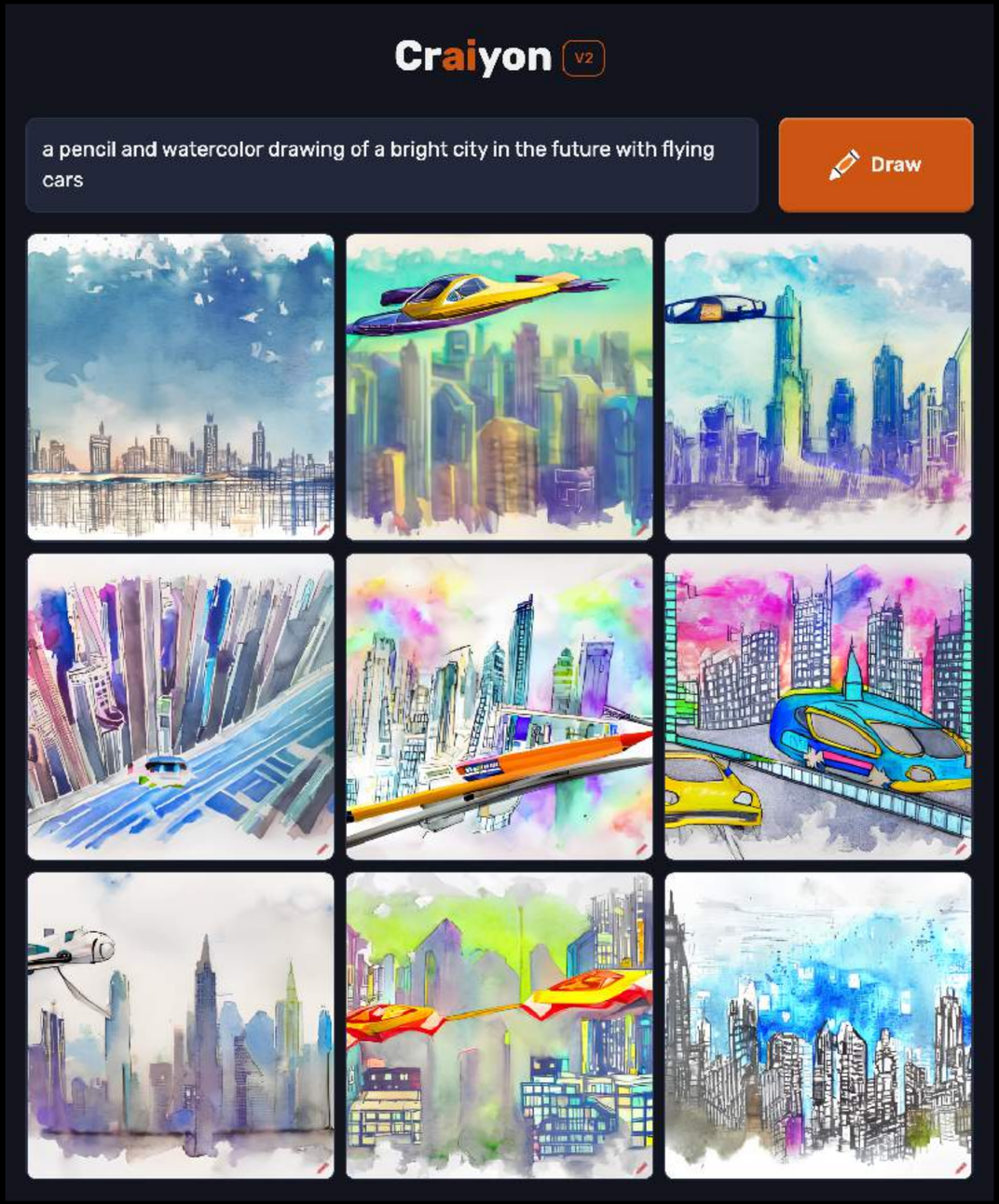
A chrome-plated duck with a golden beak arguing with an angry turtle in a forest.

Imagen

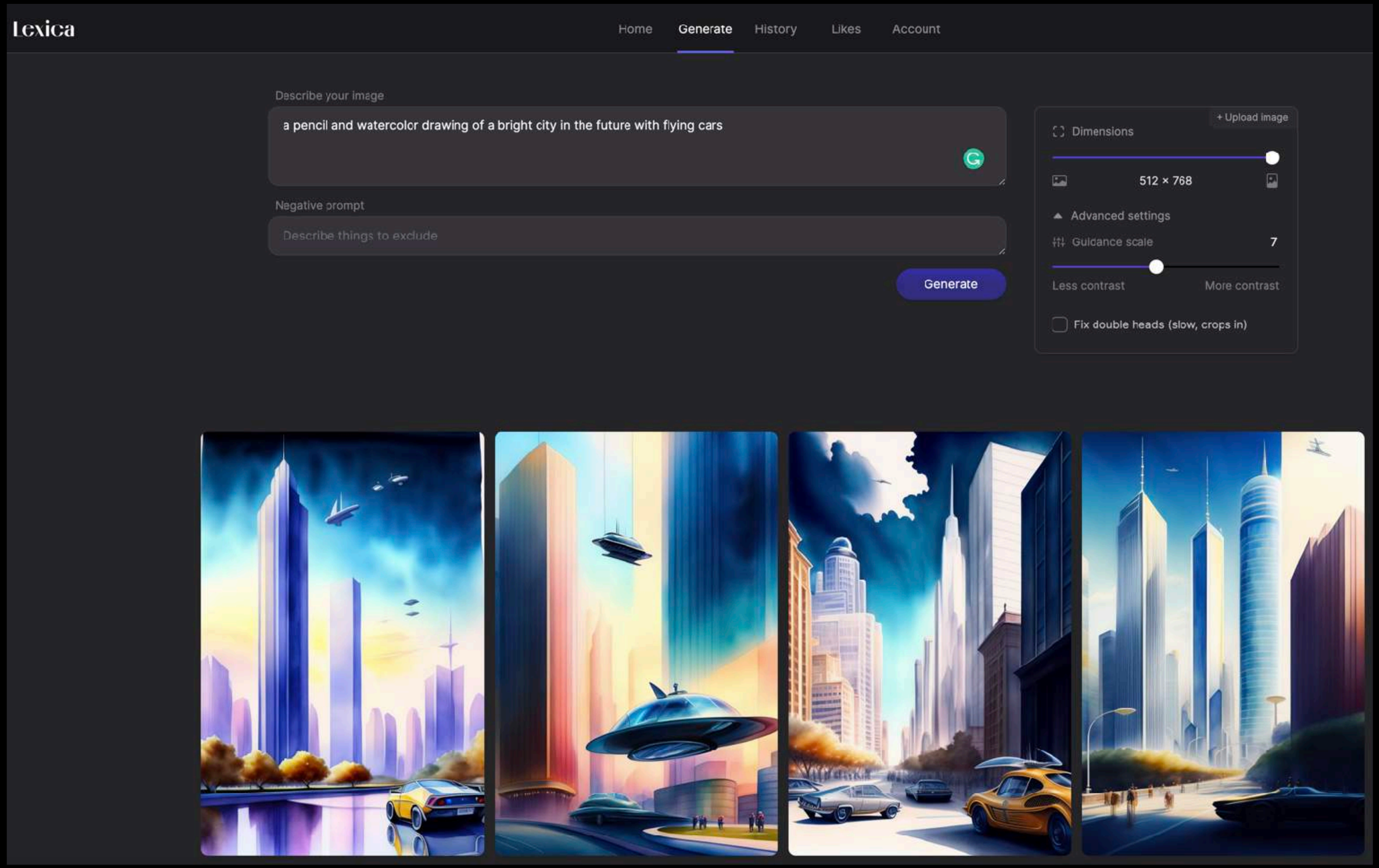
unprecedented photorealism × deep level of language understanding

Google Research, Brain Team

ALTERNATIVES: CRAIYON



ALTERNATIVES: LEXICA



ALTERNATIVES: DREAMLIKE

dreamlike.art | Studio | Profile | FAQ | Guide | Discord | Reddit | Twitter

42 credits
More in 9m

Buy Credits

Dreamlike Diffusion 1.0

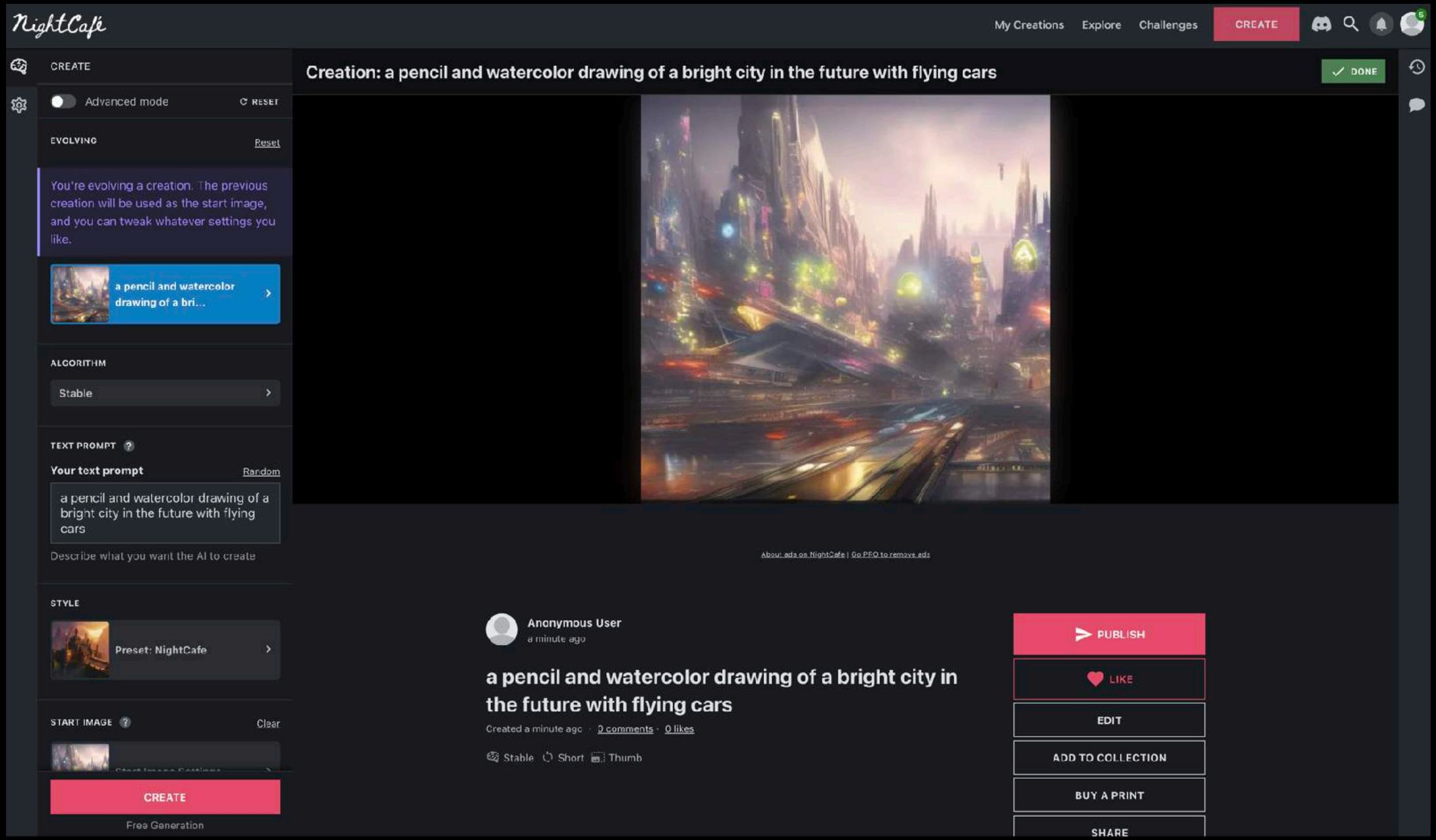
a pencil and watercolor drawing of a bright city in the future with flying cars

Dream (7.7 credits)

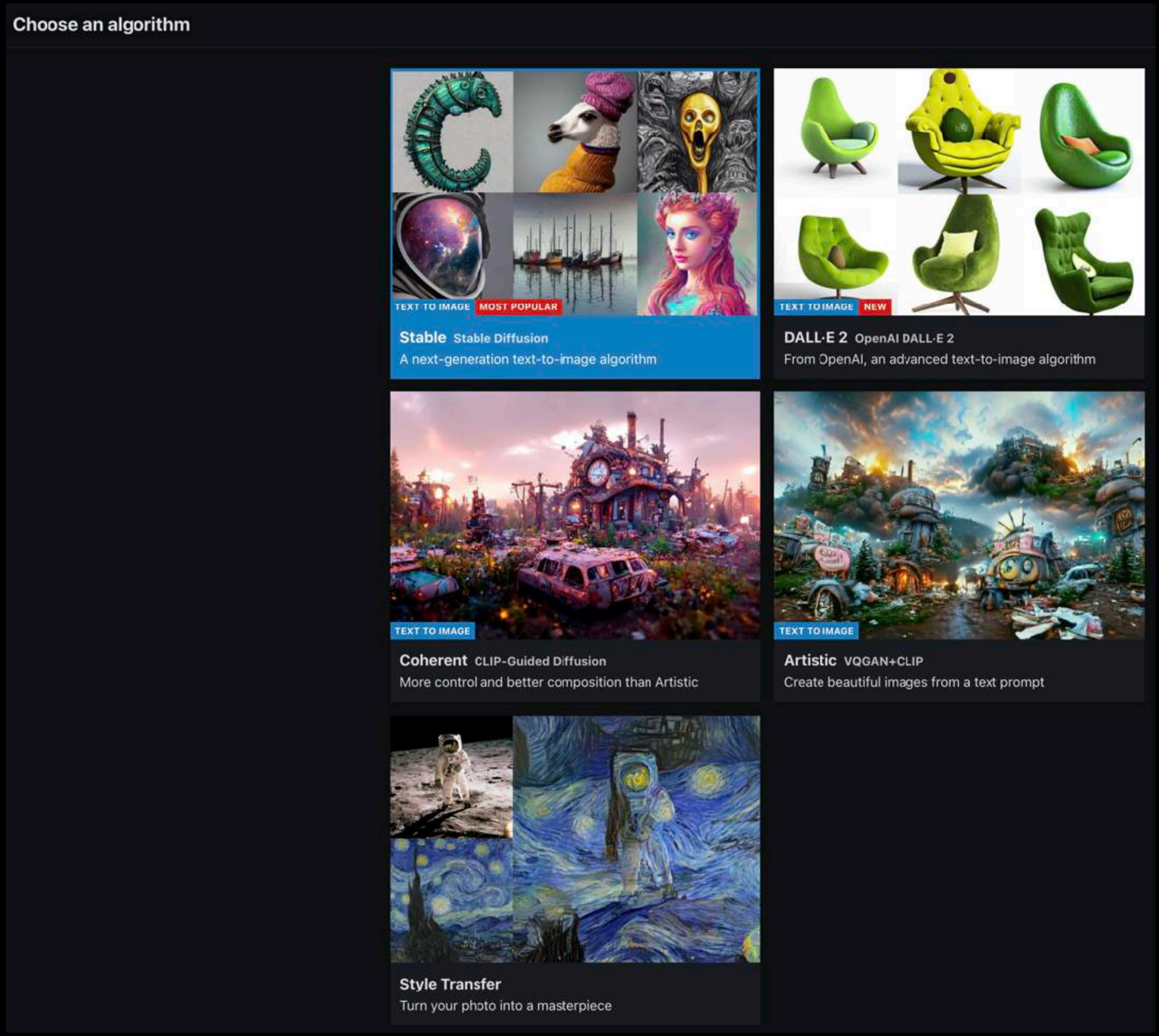
All | Enhanced | Favorites

a pencil and watercolor drawing of a bright city in the future with flying cars

ALTERNATIVES: NIGHTLIFE



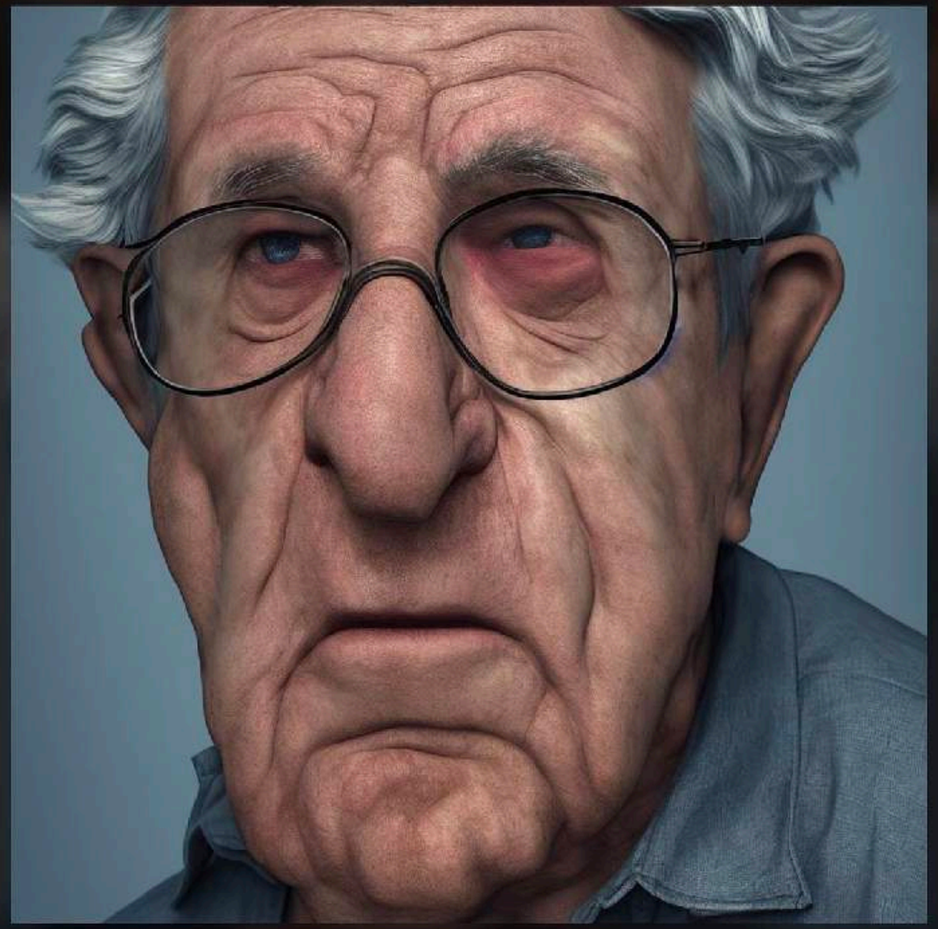
ALTERNATIVES: NIGHTLIFE



THE FUTURE: ELUNA.AI

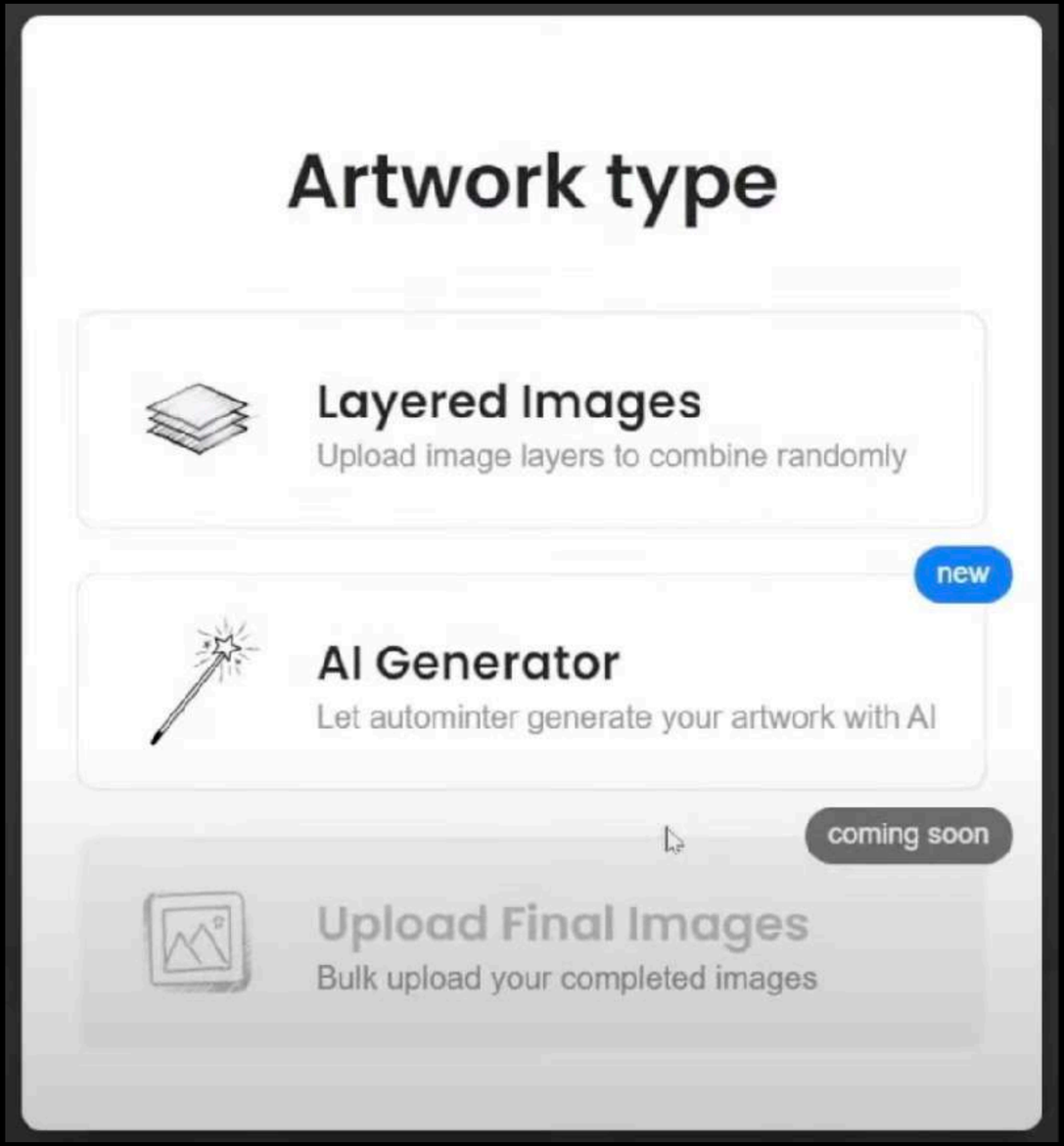
Generated with the upcoming Eluna.ai...

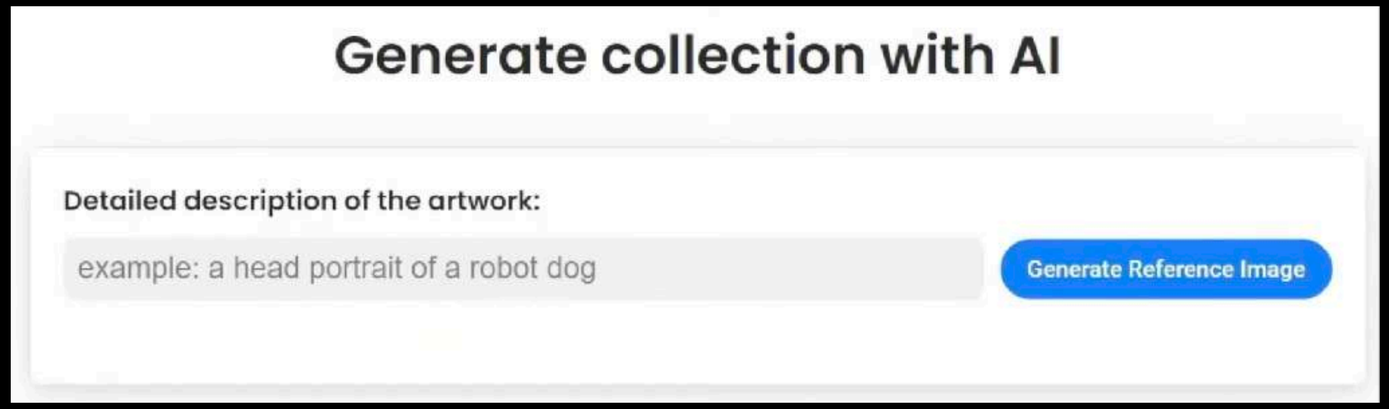
Prompt: Noam Chomsky, detailed face, spotlight, wired, multicolored, vibrant high contrast, hyperrealistic, photografic, 8k, epic ambient light, octane render



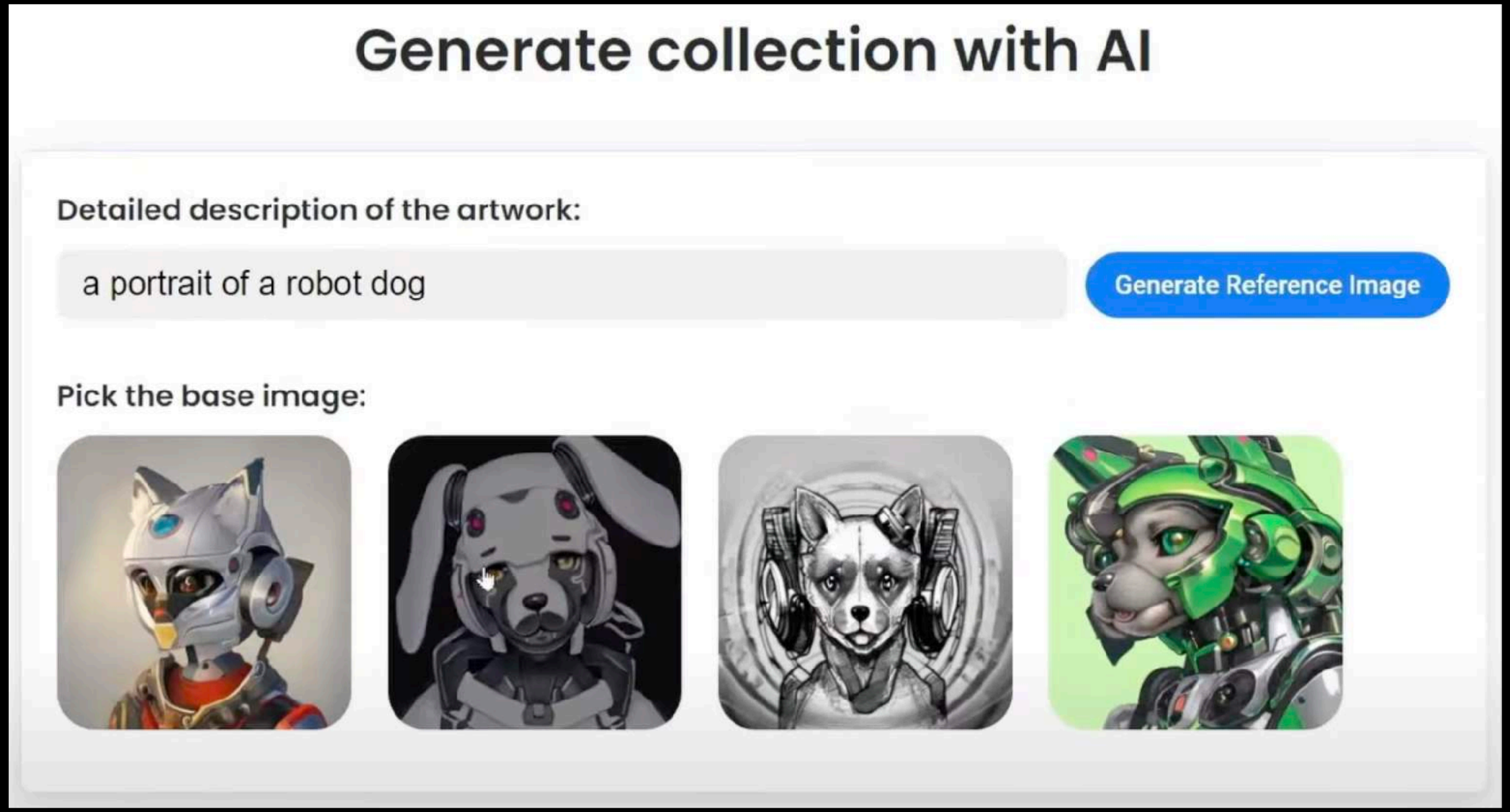
ALTERNATIVES: ELUNA.AI?

THE FUTURE: AUTOMINTER

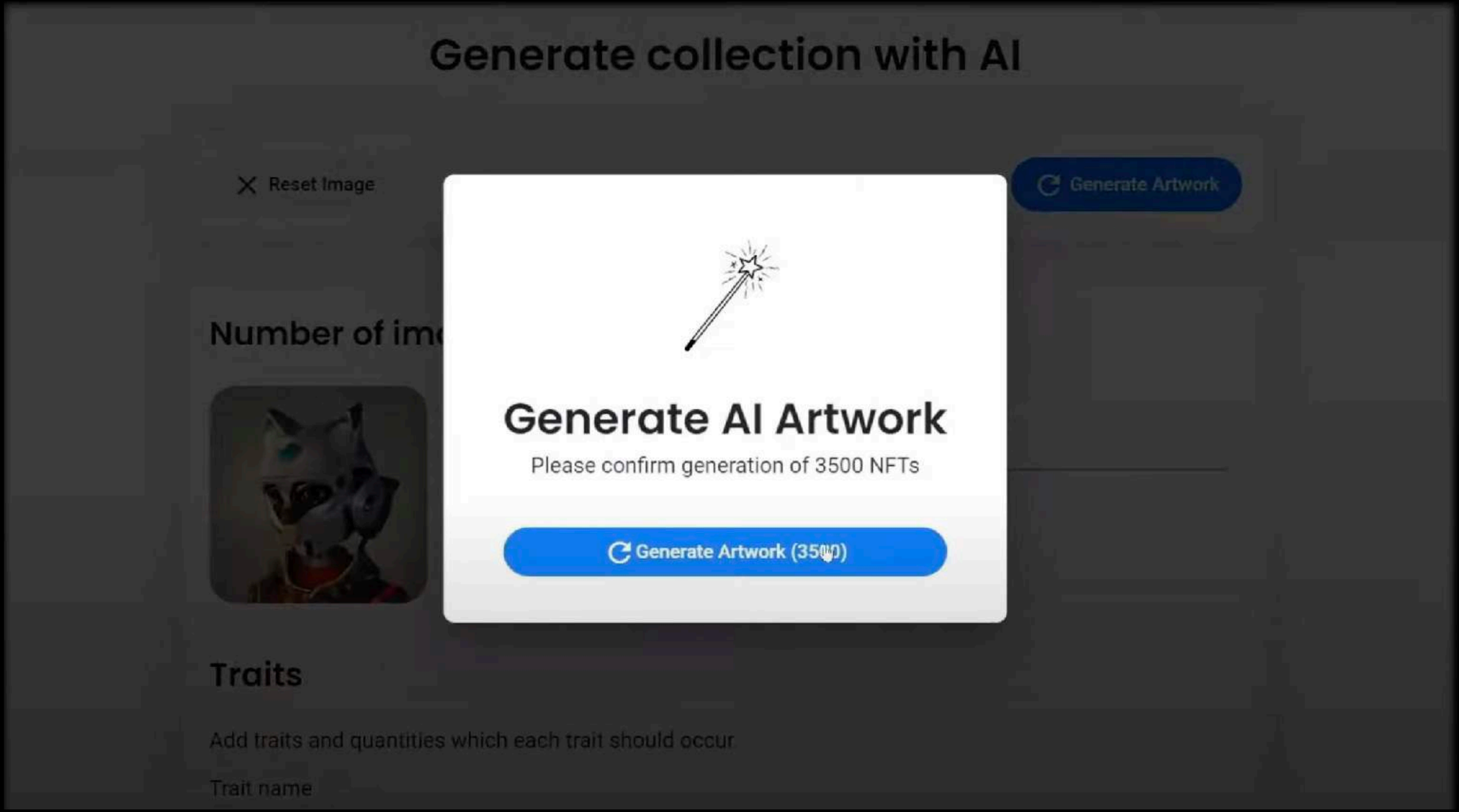




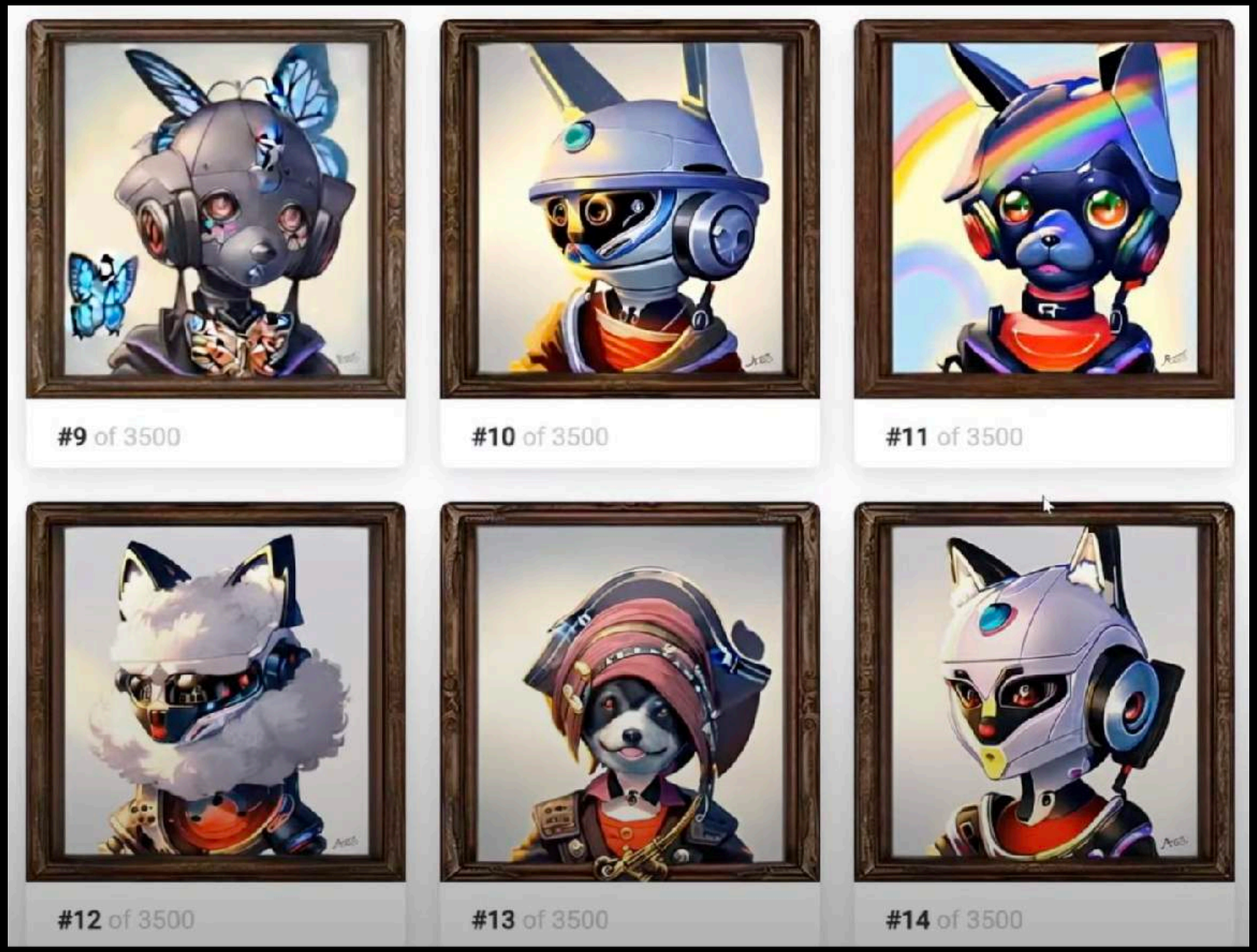
THE FUTURE: AUTOMINTER



THE FUTURE: AUTOMINTER



THE FUTURE: AUTOMINTER



QUESTIONS?

- "Nothing in this world is harder than speaking the truth, nothing easier than flattery." - Fyodor Dostoevsky, Crime and Punishment

NEXT LESSON

- AI Art - Lesson 3 - March 23, 2023

  Tools & Workflows for AI Art (Part 1)

- References: bmeadows.xyz/inpeak

Lesson 1 - An Introduction to AI Art

Summary - In this lesson, we will look at the history of AI art from the 1950s to present. We will discuss different genres and types of AI art. We will touch on famous art and artists, as well as discuss some of the controversies surrounding AI art today.

References

- History of AI Art
  - Timeline of AI Art | AIArtists.org
  - How Did A.I. Art Evolve? | Artnet
  - The Past, Present, and Future of AI Art | The Gradient
  - Where the AI Art Boom Came From | Wired
- Twitter Posts
  - Creation Process | @TheBenMeadows
  - AI Art Tutorials | @ClaireSilver12
  - Historic AI Art | @ClownVamp
  - Second Wave AI Art | @ClownVamp
  - The AI Artists List | @tender_art
  - Notable AI Artists | @0xWatkins
  - AI Behind The Scenes | @ClownVamp
- Controversy
  - AI Art Panic | Opinionated Guides
  - The AI Art At Christie's Is Not What You Think | Artnome
  - AI Is Blurring the Definition of Artist | American Scientist
  - AI won't make artists redundant - thanks to information theory
  - Is A.I. Art Stealing from Artists? | The New Yorker
  - AI or No, It's Always Too Soon to Sound the Death Knell of Art | Wired
  - AI-art isn't art | The Intrinsic Perspective
  - Have AI image generators assimilated your art? | Ars Technica
  - The scary truth about AI copyright is nobody knows what will happen next | The Verge
- Artist Profiles
  - PROOF Podcast - AI Art is Not Art, with Best-Selling AI Artist Claire Silver
  - Four Artists Open Up About AI