

AI GENERATED
DESIGN



Text



Video

AI
Generated
Media



Images



Voice



Characters



Music



3D Objects



Text



Video

AI
Generated
Media



Images



Voice



Characters



Music



3D Objects

Playground (i)



Load a previous session



Enter text and submit (Ctrl+Enter or ⌘+Enter) to get a completion.



Submit →



(venv2) → home



GPT-NeoX

GPT-NeoX
Apache 2.0

[huggingface.co/EleutherAI/
gpt-neox-20b](https://huggingface.co/EleutherAI/gpt-neox-20b)

GPT-3

GPT-3 (175B)

beta.openai.com



ChatGPT

chat.openai.com/chat



GPT-J

GPT-J

[huggingface.co/EleutherAI/
gpt-j-6B](https://huggingface.co/EleutherAI/gpt-j-6B)

GPT-3

GPT-3

beta.openai.com

a BigScience initiative

BLOOM

176B params · 59 languages · Open-access

BLOOM

[huggingface.co/bigscience/
bloom](https://huggingface.co/bigscience/bloom)



Text



Video

AI
Generated
Media



Images



Voice



Characters



Music



3D Objects

TEXT DESCRIPTION

An astronaut Teddy bears A bowl of soup

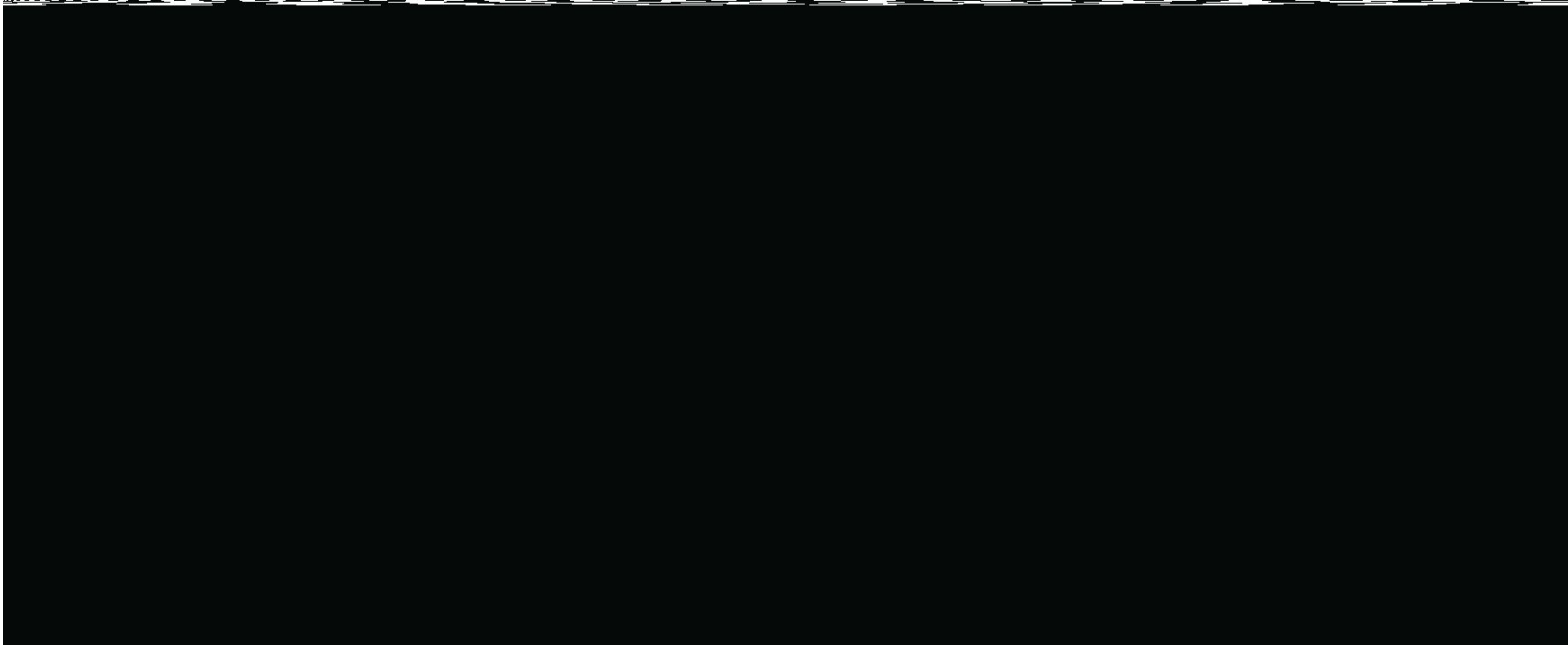
riding a horse lounging in a tropical resort in space playing basketball with cats in space

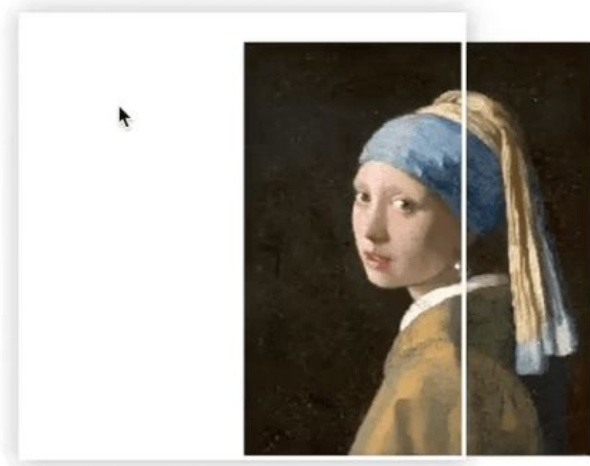
in a photorealistic style in the style of Andy Warhol as a pencil drawing



DALL-E 2









The last selfie on earth



If the sun exploded



The next pandemic





The image generation models might not know a concept or person well enough to generate an image. For this, **you can also finetune the model on your own images.** The following images have been made by fine tuning a model with 25 images of Neil Gershenfeld.











<https://github.com/XavierXiao/Dreambooth-Stable-Diffusion>



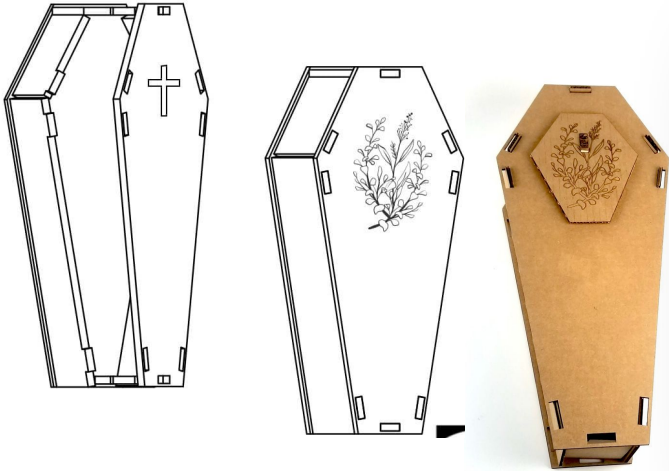
<https://github.com/XavierXiao/Dreambooth-Stable-Diffusion>





For fabrication, these methods can be useful for
ideating and generating **visual concepts**

MALLEBROK



Overview Documentation Examples Playground

Playground Save

(a) name of assembly set of small wood pieces (Ikea-style) for an odd or niche application and (b) what that application is. The name (a) and application (b) has to be quirky and implicitly comment on social issues:

3. "The Coffin Assembly Set": A morbid take on the classic assembly set, this small set of pieces can be put together to create a replica coffin. The kit is designed as a way for people to come to terms with their mortality; it forces them to confront the inevitability of death and consider their own final resting place. This product would provide some much-needed levity in the face of our fear of dying.

Give your old new life.

DIFFICULTY LEVEL: ADVANCED
#die-kea-inspo



Design and Quality
DIE-KEA of Denmark



Playground

Load a preset...

Save

What interesting object would be a good outline of my pcb that is a mystical morse-code device?

1. A good object to use as an outline for a mystical morse-code device would be a crystal ball.
2. Another good object to use as an outline for a mystical morse-code device would be a magical wand.
3. Yet another good object to use as an outline for a mystical morse-code device would be a mystical amulet.



Playground

Load a preset...

Save

Write a paragraph that an undiscovered mystical entity might write trying to get in touch with humanity through a mystical amulet:

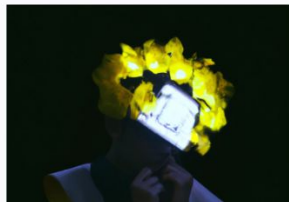
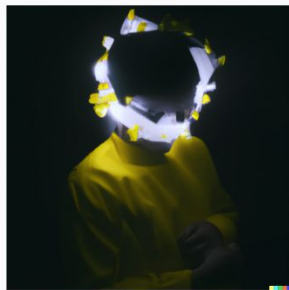
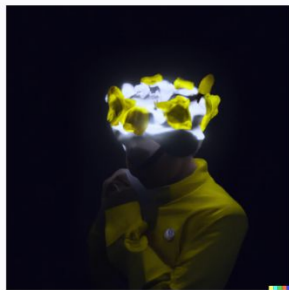
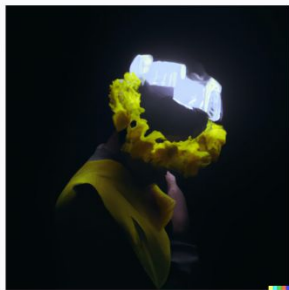
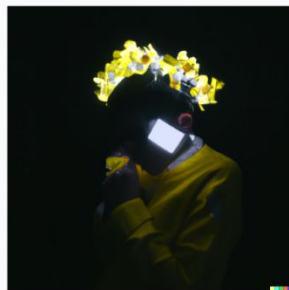
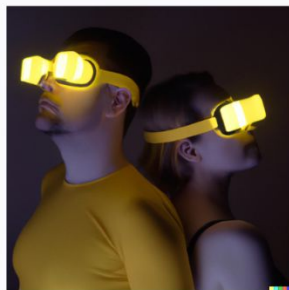
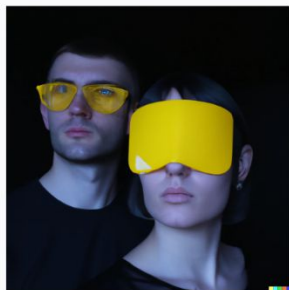
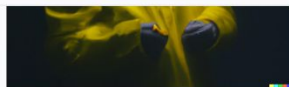
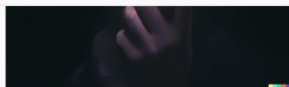
I am an ancient and powerful being that has been around since the dawn of time. I have seen the rise and fall of civilizations and the birth and death of stars. I am immortal and all-knowing, and I have come to warn you of the impending doom that awaits your world. The end is near, and there is nothing that you can do to stop it. I have chosen to contact you through this amulet because I know that you are a seeker of knowledge and wisdom. I implore you to



DALL-E

History

Collections



ORGANS WITHOUT BODIES



Valdemar Danry,
Research Assistant,
Fluid Interfaces Group
MIT Media Lab

Cenk Güzelis,
PhD Researcher and Artist,
Institute of Experimental Architecture
Innsbruck University





AI generated
image



AI generated 3d
model



3D printed




In envisioned context





Hey, I'm trying to come up with some interesting, fantastical ways of decorating a living room for a design project.

 Sure, there are many fantastical ways you could go about decorating a living room. Here are a few ideas to get you started:

1. Create a fairy tale-inspired living room by using pastel colors and adding elements like a magical castle mural on one wall, a chandelier made of branches and twinkling lights, and comfortable furniture with curved, whimsical shapes.
2. Transform the living room into an enchanted forest by hanging sheer, green fabric from the ceiling to create a canopy effect, adding potted plants and trees, and using earthy tones and natural materials for the furniture and decor.
3. Make the living room into a futuristic space by using sleek, modern furniture and lighting, and adding metallic accents and pops of vibrant color. You could also incorporate unique, space-age elements like a holographic fireplace or a ceiling mural depicting a starry sky.



Reverse (prompt) engineer

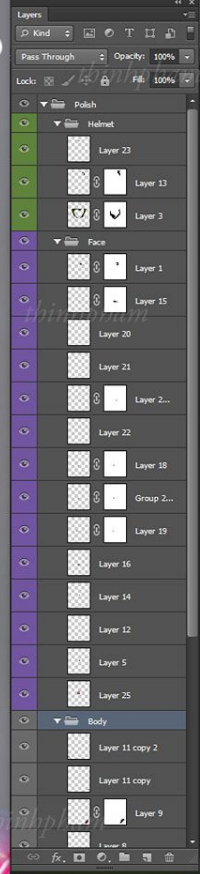
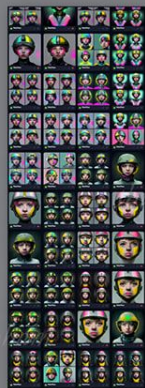


a woman in a white dress with a veil over her head, cyberpunk art, generative art, korean women's fashion model, organic structure, an young urban explorer woman, depicted as a 3 d render, bone jewellery, voronoi, young asian woman

Midjourney AI:

392 results from my origin prompt

Tweaked prompts many times on the V U



Used Photoshop for the final rendering

thinkpham

“3D” 



3D modeled init imagery





Midjourney

midjourney.com



DALL·E 2

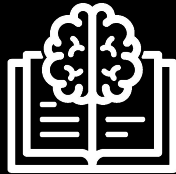
labs.openai.com



stabilityai

Stable Diffusion

replicate.com/stability-ai/stable-diffusion



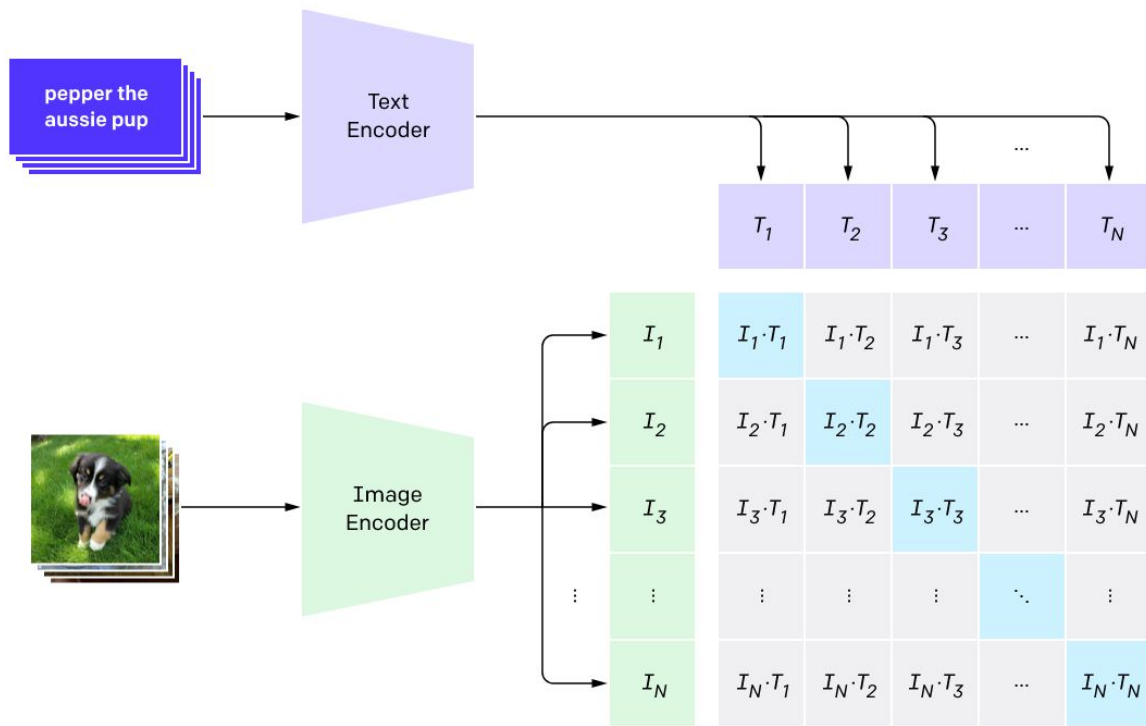
How?

(abridged)



CLIP (Jan 2021)

- A neural network which learns visual concepts from natural language supervision
- “Zero shot learning” of previously unseen concepts
- Released by OpenAI
- Trained on 400M image-caption pairs (closed dataset)



SIREN+CLIP (Jan 2021)

- @advadnoun connected CLIP to an image generation function (SIREN, Stanford University 2020)
- BigGAN + CLIP in Feb 2021

“A sea otter in the style of ‘Girl with a Pearl Earring’ ”



[Code](#)

VQGAN+CLIP (Apr 2021)

- @RiversHaveWings et al. extended the concept with a different generative architecture

“A sea otter in the style of ‘Girl with a Pearl Earring’ ”



DALL·E 2 (Nov 2022)

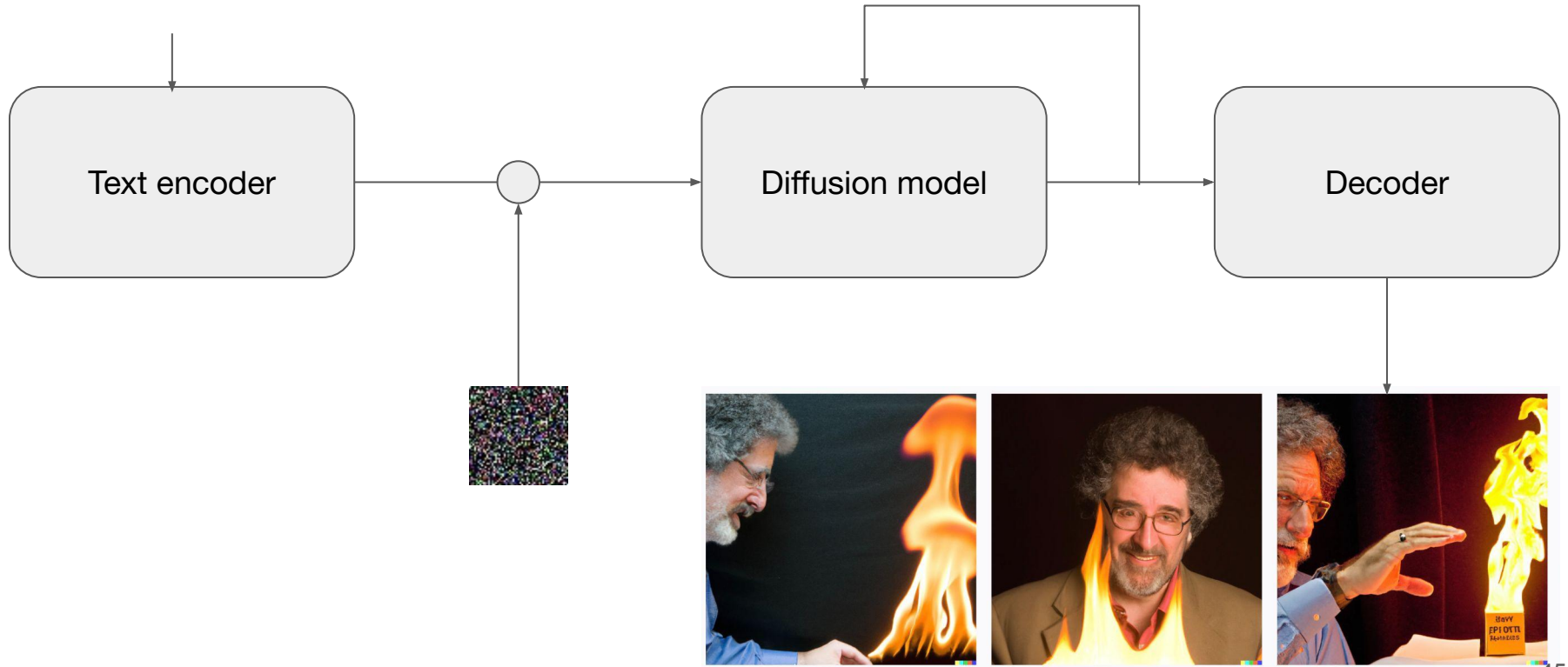
- Diffusion + CLIP
- Super super-resolution, starting from pure noise
- Neural network hallucinates visual details that will be most likely given the input



“A sea otter in the style of ‘Girl with a Pearl Earring’ ”



“Neil Gershenfeld
discovers fire”



Stable Diffusion in KerasCV

```
## Stable Diffusion in KerasCV

model = keras_cv.models.StableDiffusion(img_width=512, img_height=512)

images = model.text_to_image("Neil Gershenfeld discovers fire", batch_size=3)
```

Have I Been Trained?

🔍 Neil Gershenfeld|



Search 5.8 billion images used to train popular AI art models

Text encoder

Generative model &
decoder

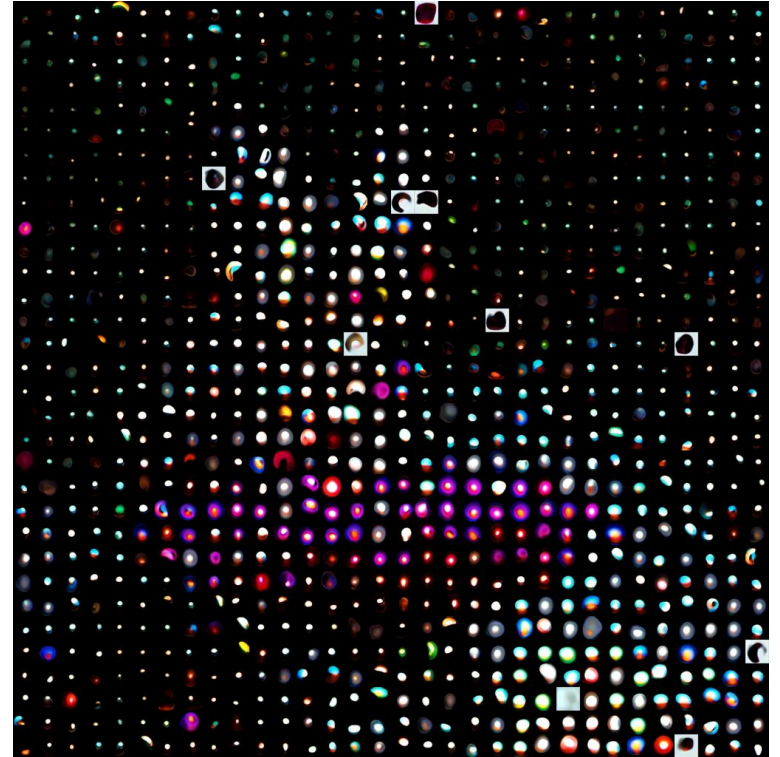
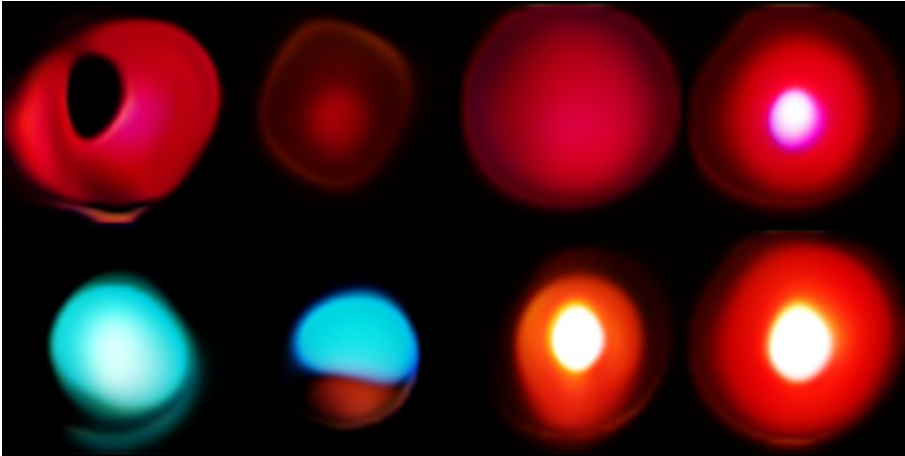
CLIP
CLOOB
BLIP
OpenCLIP
...

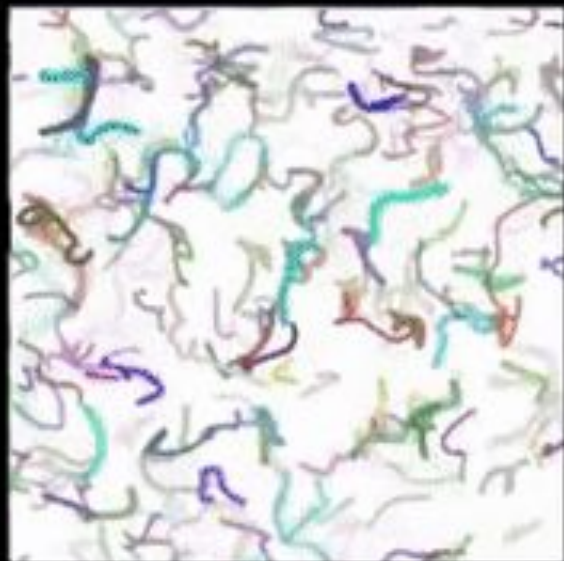
GAN
e.g., BigGAN, StyleGAN

VAE
e.g., VQVAE

Diffusion
e.g., GLIDE, unCLIP
...

Any image generator can be discriminated with CLIP





"Underwater
Submarine"

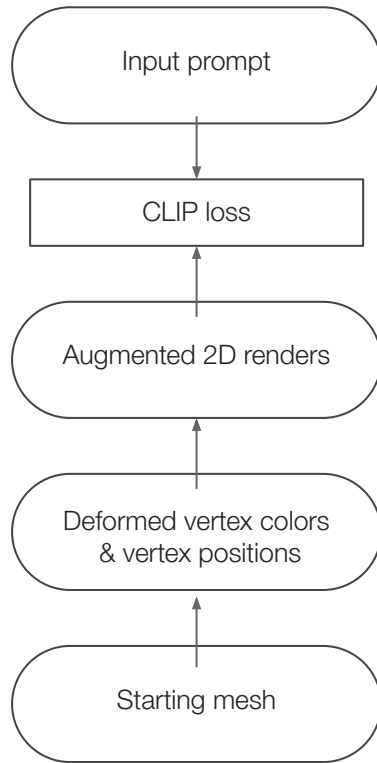


"Forest Temple as
3D Rendered in
Unreal Engine"



"Watercolor painting of
a fire-breathing
dragon"

We can also render 3D models to 2D in this workflow



“A tiny planet full of plants, colorful flowers, and a waterfall”

Differentiable rendering





Text



Video

AI
Generated
Media



Images



Voice



Characters

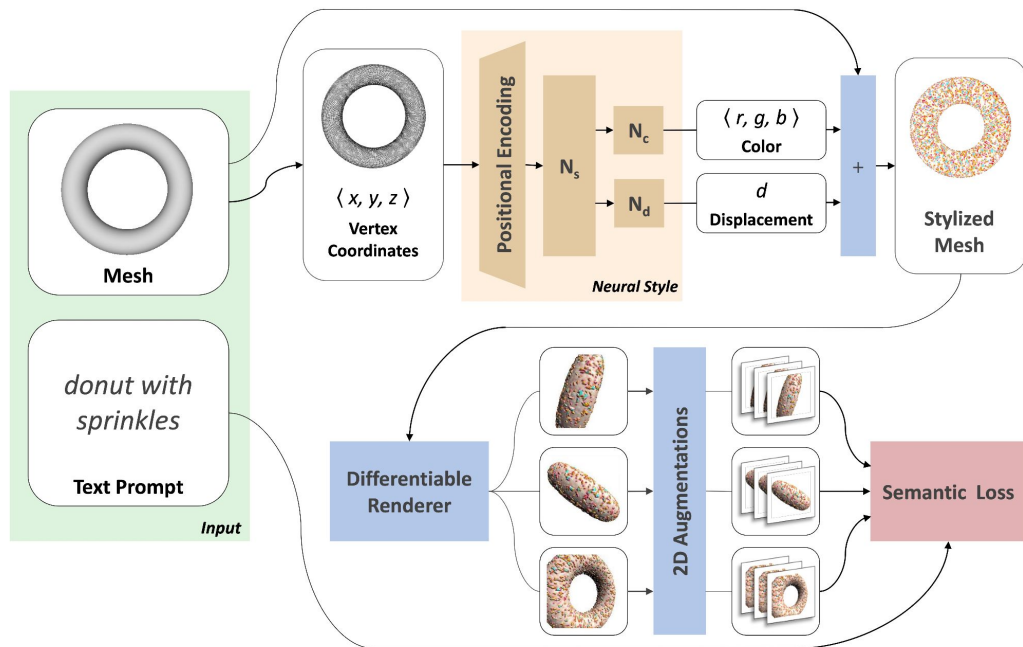


Music



3D Objects

Text2Mesh (Dec 2021)



a camel made of brown crochet

Clip-mesh (Dec 2022)

“A wooden table”



ClipMatrix (Sept 2021)

“Horned God of Biodiversity,
painted by Haeckel”

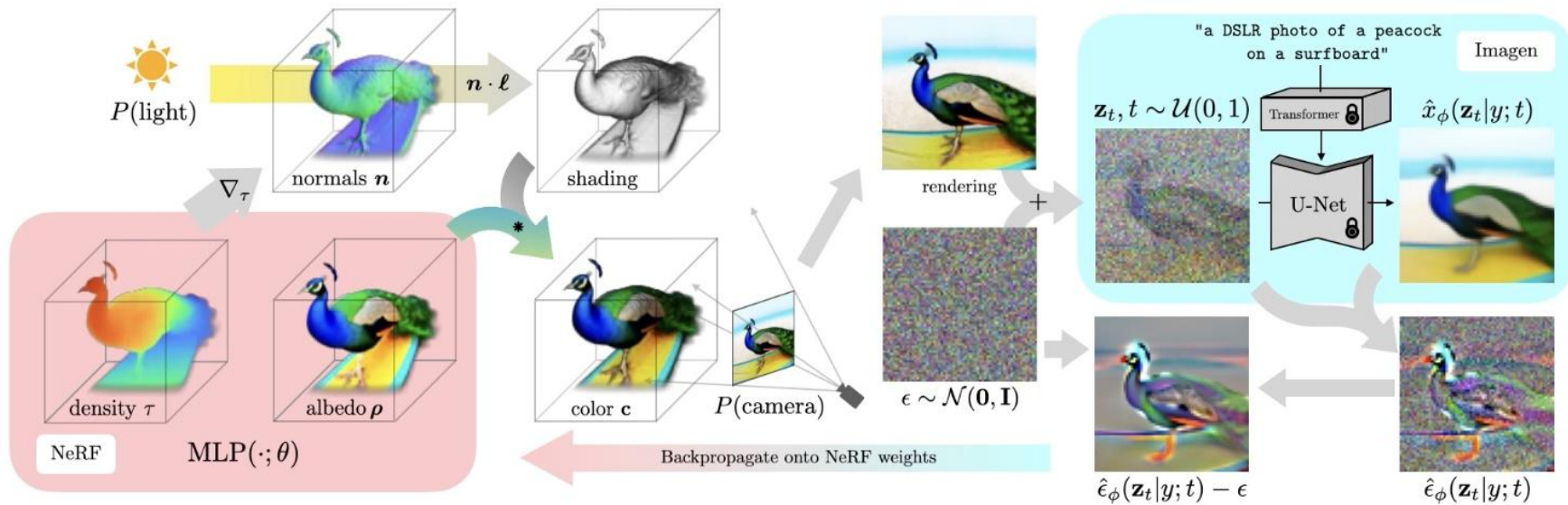


Dreamfields (May 2022)

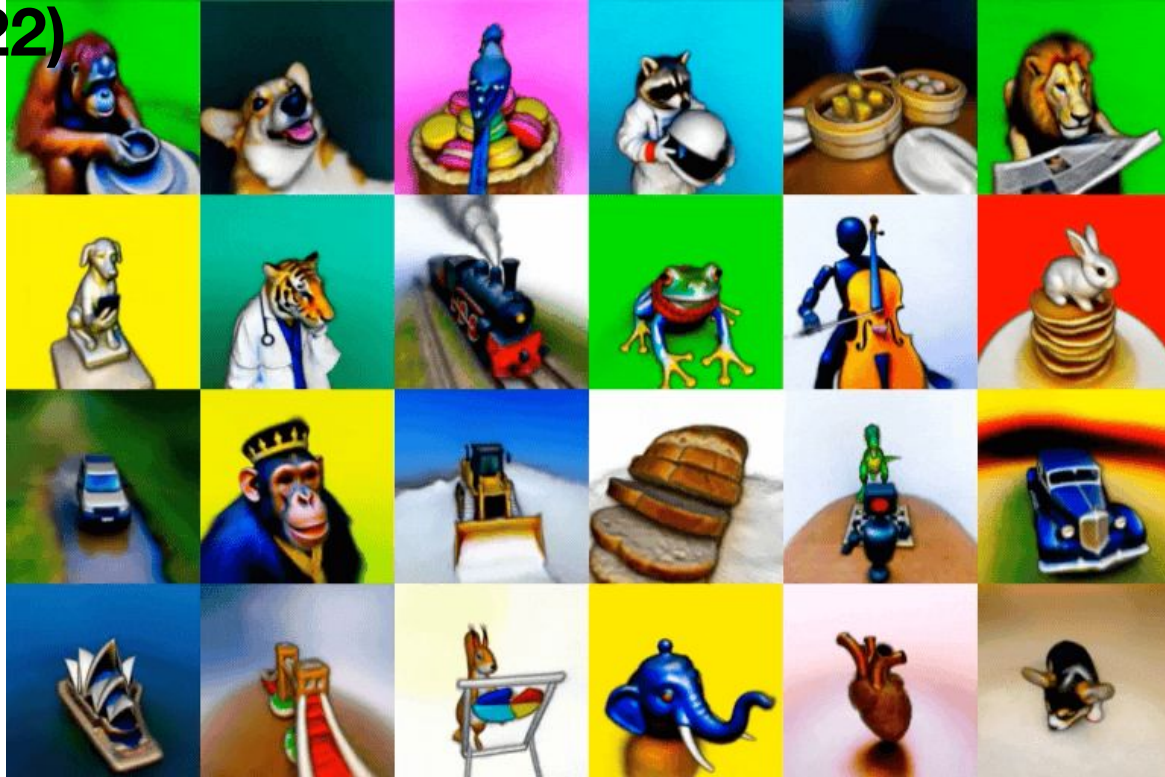
CLIP → NeRF



Dreamfusion (Sept 2022)

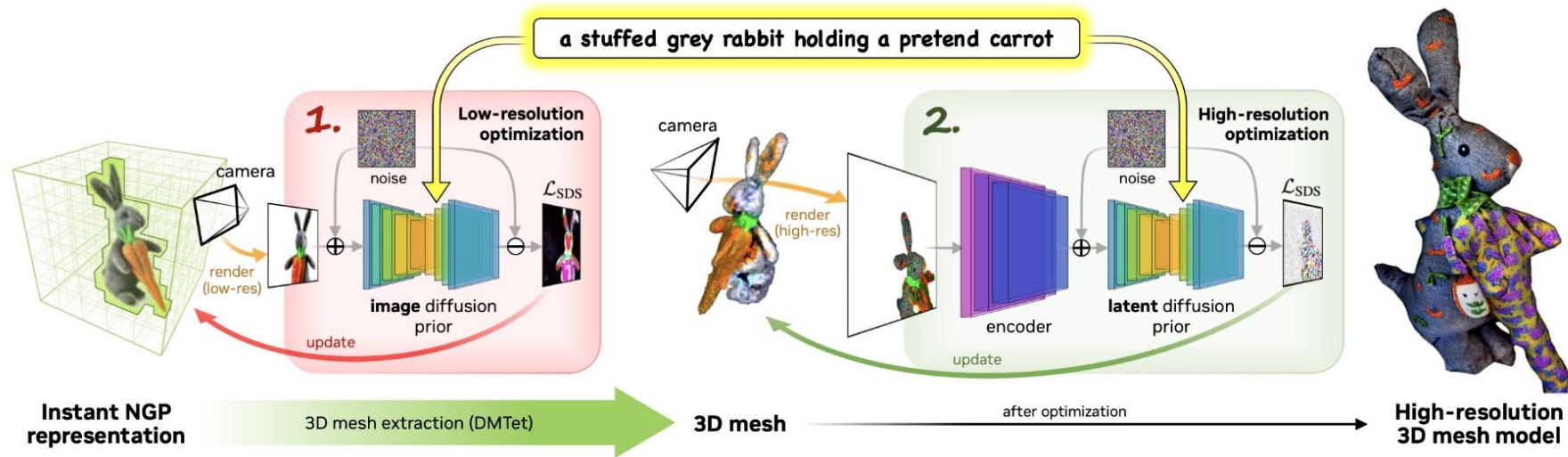


Dreamfusion (Sept 2022)



[Stable Dreamfusion Code](#)

Magic3D (Nov 2022)



Magic3D (Nov 2022)

Michelangelo style statue
of an astronaut.



DreamFusion



Magic3D



Dreamfields

Dreamfields

[github.com/shengyu-meng/
dreamfields-3D](https://github.com/shengyu-meng/dreamfields-3D)

(fork)

Dreamfusion

Dreamfusion

[github.com/ashawkey/
stable-dreamfusion](https://github.com/ashawkey/stable-dreamfusion)

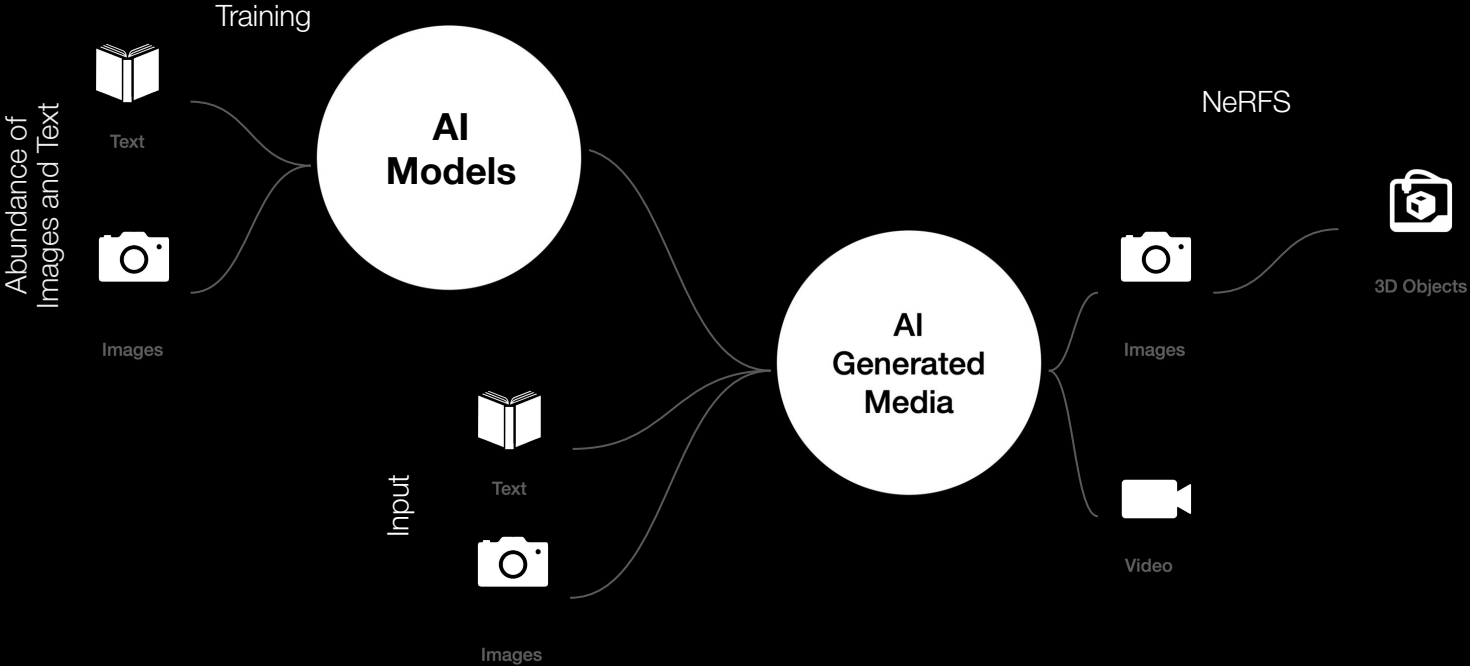
(fork)

Magic3D

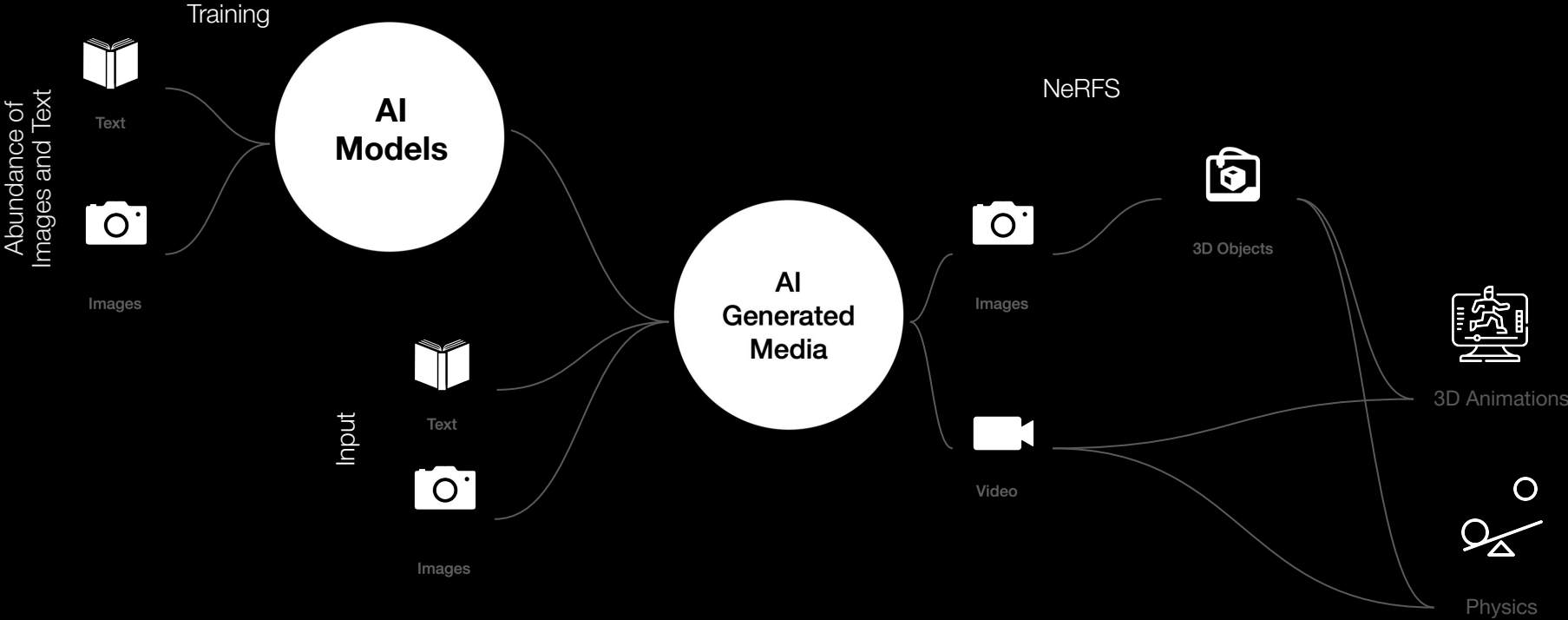
Magic 3D, nvidia

deepimagination.cc/Magic3D/

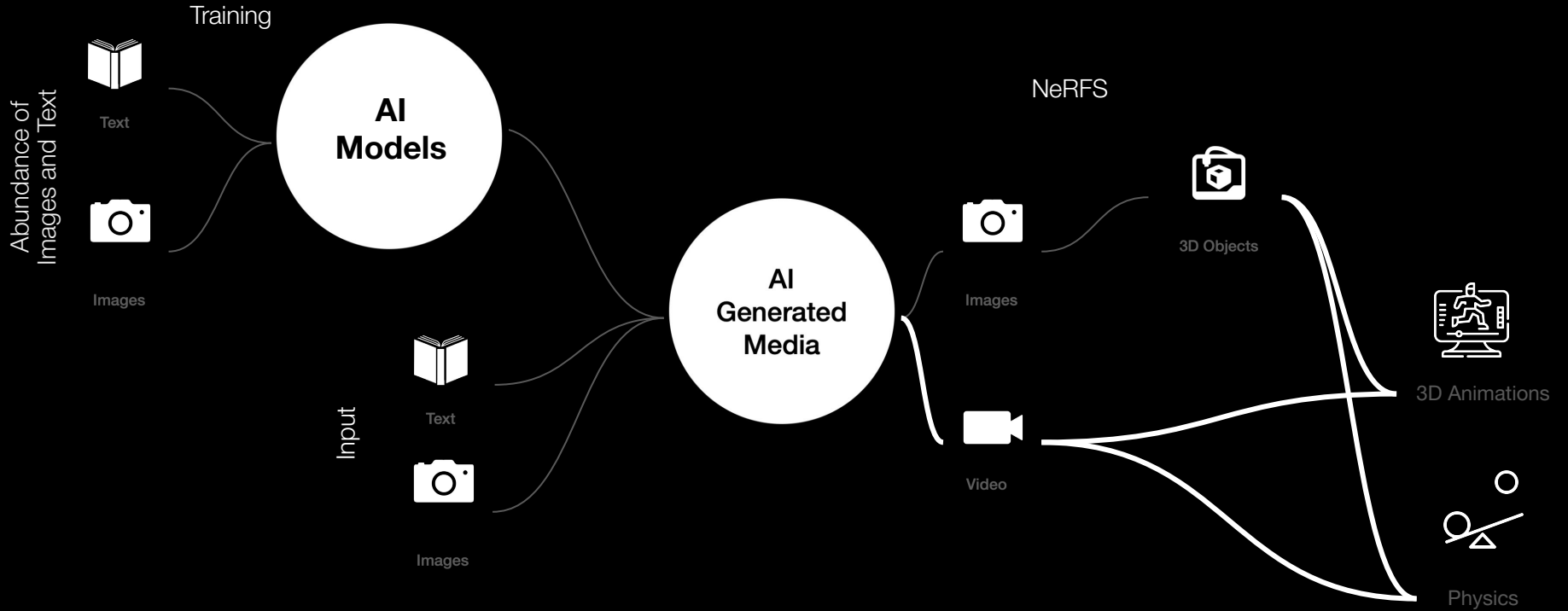
Current State-of-the-Art Research Workflow



Current State-of-the-Art Research Workflow

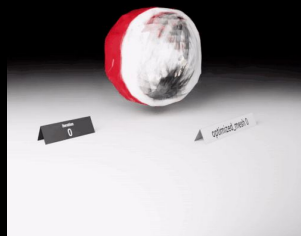
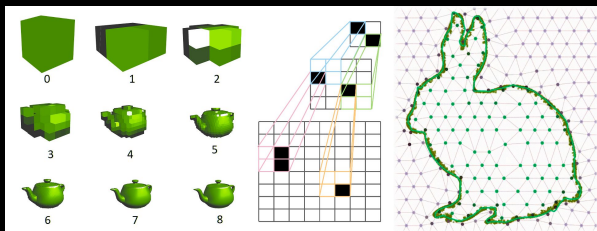


Current State-of-the-Art Research Workflow



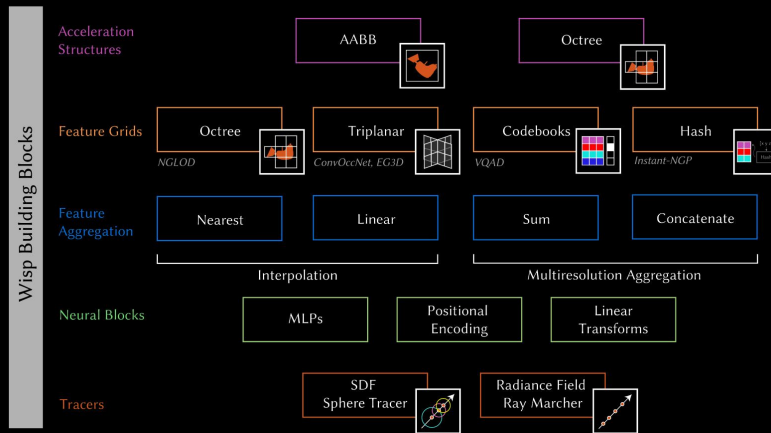
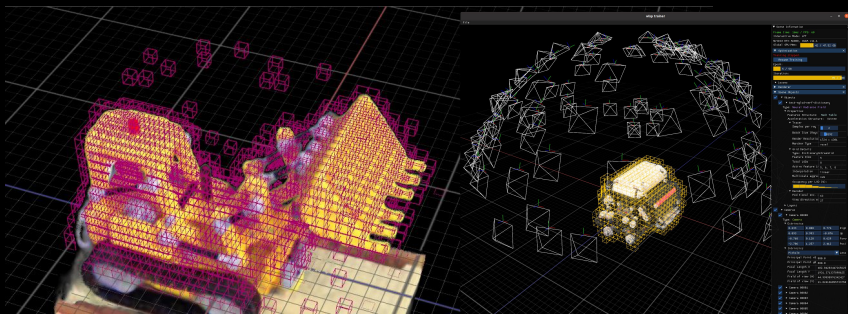
Text to Video | 3D to Animation | Video to 3D | Video to Physics

3D Deep Learning Libraries



Surge in 3D Deep learning libraries
([PyTorch3D](#), [NVIDIA Kaolin](#))

- Modular Differentiable rendering
- 3D Data Loading and Modular Cameras
- GPU-Optimized 3D Operations
- Building Blocks for Neural Fields Research
- Neural Fields Visualization (NeRF)

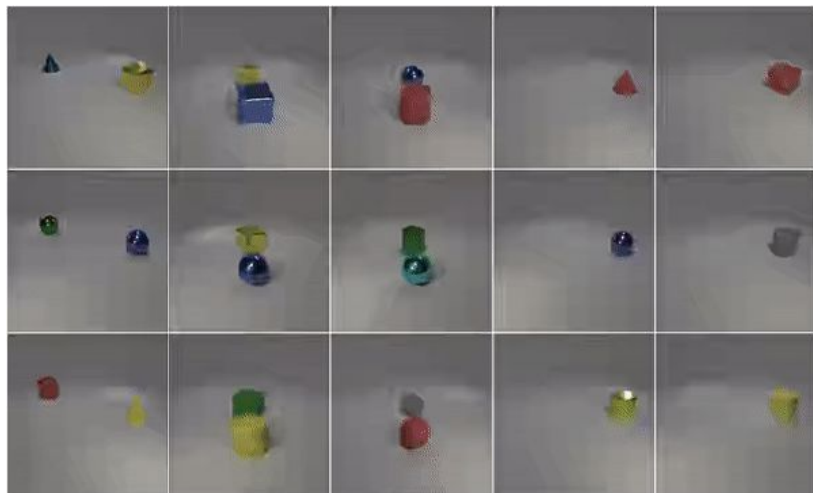


Text to Videos



3D (NeRF) to Animation

Editing and Manipulating NeRFs



Moving & Rotating Objects



Adding Objects

Modifying Object Appearance



Changing Background



Modifying Appearance



Modifying Shape

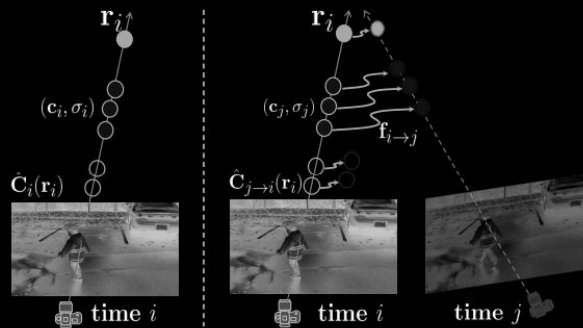
* Niemeyer, Michael, and Andreas Geiger. "Giraffe: Representing scenes as compositional generative neural feature fields." Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition. 2021.

** Schwarz, Katja, et al. "Graf: Generative radiance fields for 3d-aware image synthesis." *Advances in Neural Information Processing Systems* 33 (2020): 20154-20166.

Videos to 3D (NeRF)

Dynamic Scene Representation

Input video



Fixed Time, View Interpolation



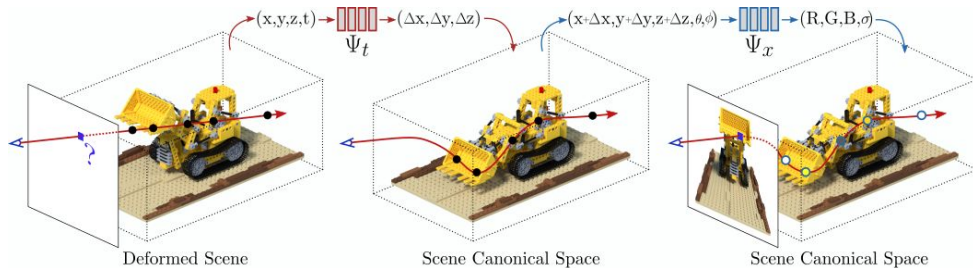
Fixed View, Time Interpolation



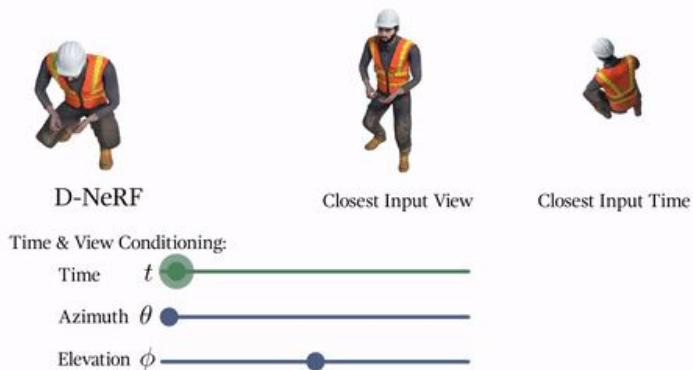
Space-Time Interpolation

Videos to 3D (NeRF)

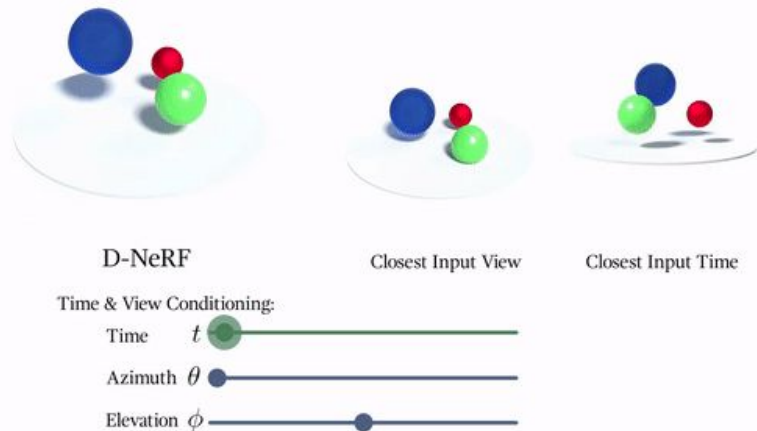
Dynamic Scene Representation



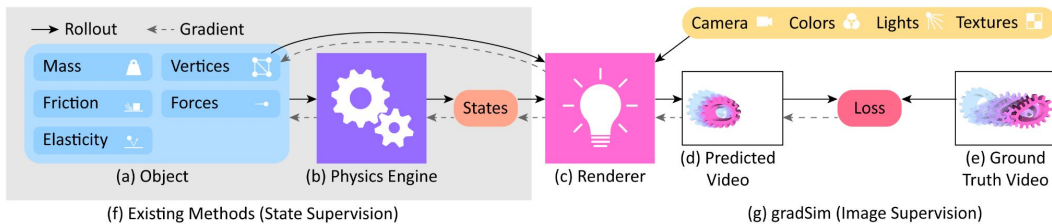
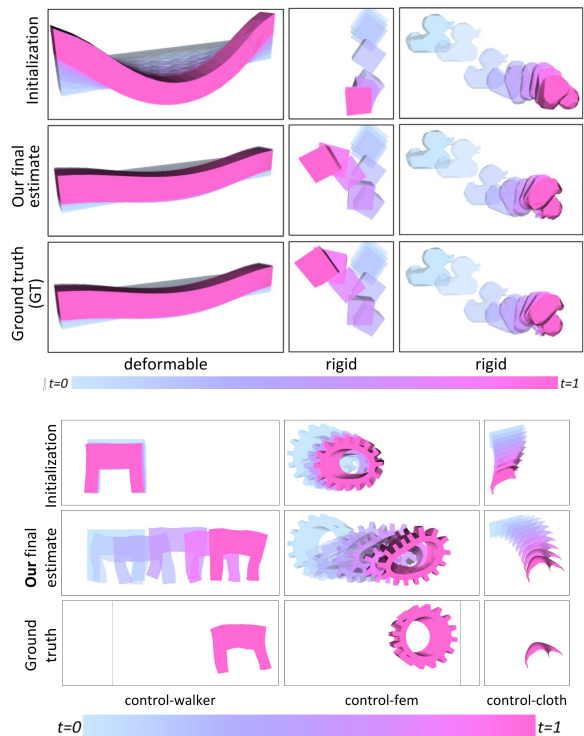
Synthesis Results



Synthesis Results



Videos to Physics

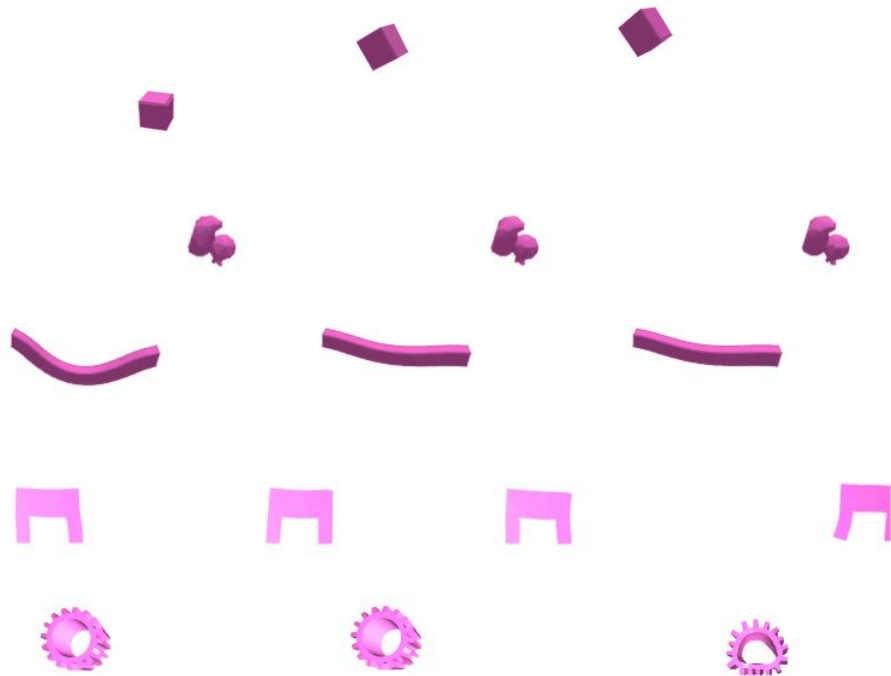


Mass Estimation

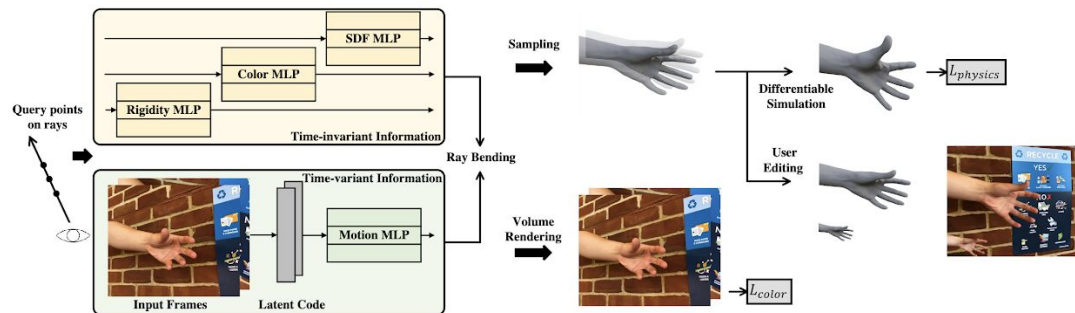
Friction Estimation

Material Properties Estimation

Visuomotor Control



Videos to Physics



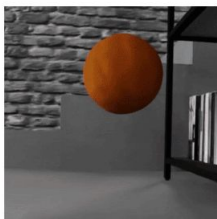
Delete Foreground



Highlight Foreground



Delete Foreground



Highlight Foreground



Source Video



Ours



D-NeRF [1]



NeuS [2]



Estimated Material



Hard Material



Soft Material



Estimated Velocity and Gravity



Add Rightward Velocity



Add Leftward Velocity



Source Video



Ours

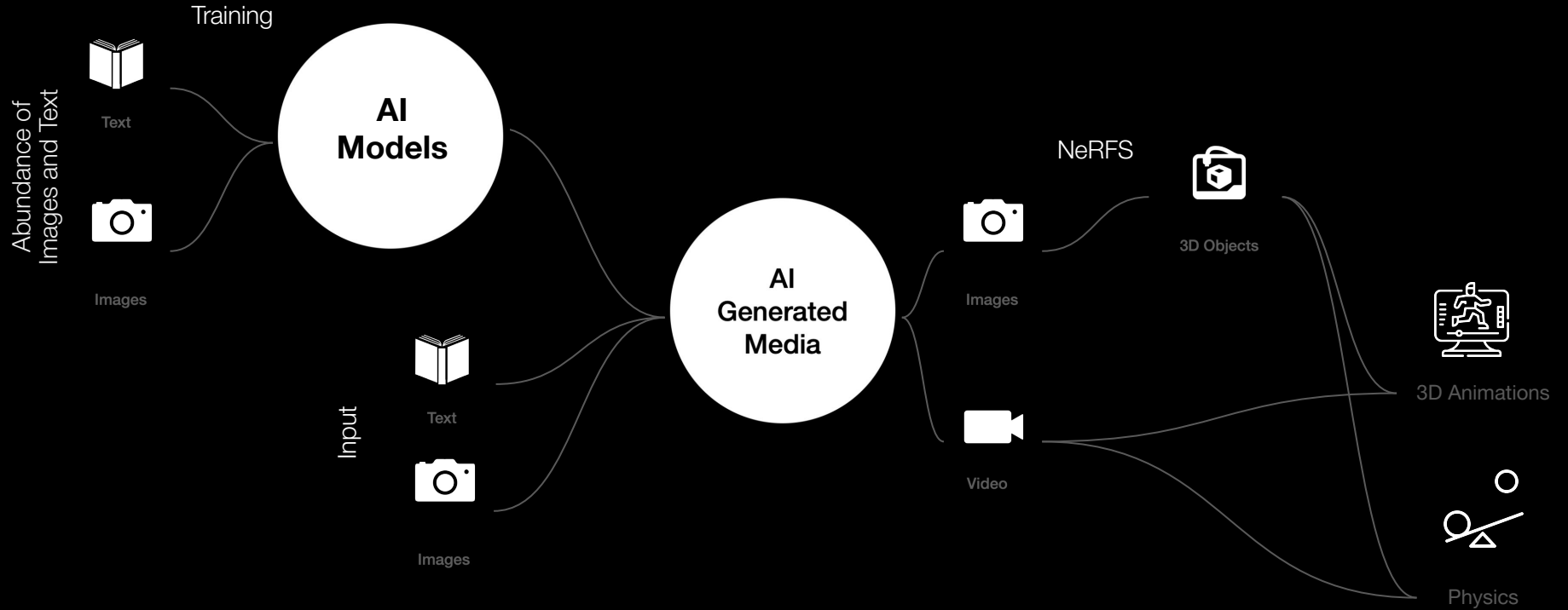


D-NeRF [1]

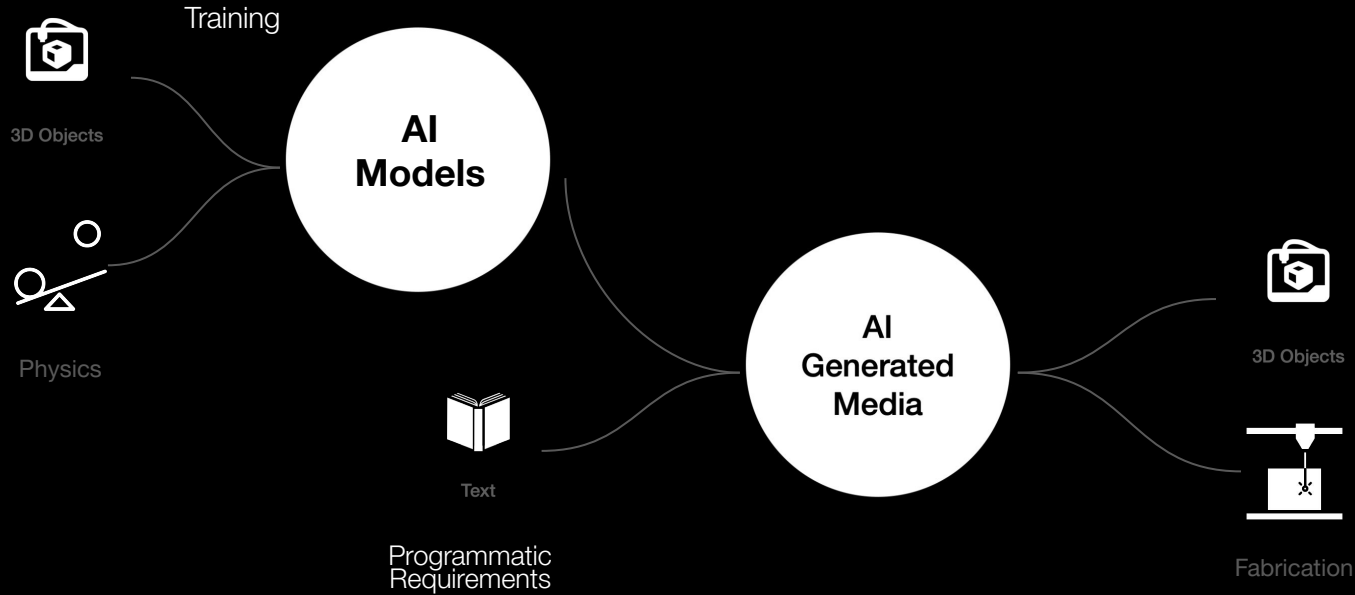


NeuS [2]

Current State-of-the-Art Research Workflow



Desired Workflow



Limitations / Ethics



...



Share

Save ▾

“Artistic portrait photo of a person with cyborg parts, black background, yellow light, artistic”



Valdemar × DALL-E

Human & AI



“Salmon swimming in the river”

The New York Times

An A.I.-Generated Picture Won an Art Prize. Artists Aren't Happy.

"I won, and I didn't break any rules," the artwork's creator says.

The Atlantic

I Went Viral in the Bad Way

A few lessons from my mistake

By Charlie Warzel

FEATURE

AI Creating 'Art' Is An Ethical And Copyright Nightmare

If a machine makes art, is it even art? And

Karla Ortiz @kortizart · Aug 13

Curious. Are there any living artists there? Were they added with their consent? Also what about artist's estates? In pretty sure Giger's, Mead's, Kinkadee's, Miura's estates would wish to have a say in this.

Also I KNOW disco diffusion features many of my peers...

Bokar N'Diaye @bokar_n · Aug 13

Top 20 dead artists used in @StableDiffusion Discord bot queries as of today, 1-2 PM, among the 773 artists in the collective archive of @sureallabs, @proximasan, @KyrickYoung and @EErratica. Can't wait for the Disco Diffusion 4000+ artists to be added!

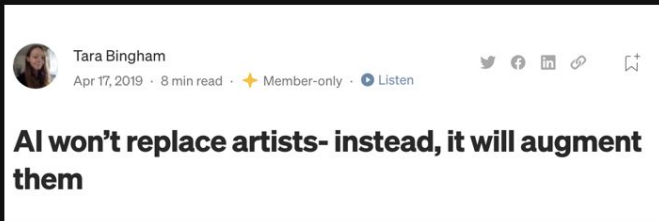
[Show this thread](#)

Artist	Date of Death	Hits on Discord (family name mostly)
Mucha, Alphonse	1939	142674
Beksinski, Zdzislaw	2005	37195
Moebius	2012	28150



MOTHERBOARD
TECHBYVICE

An AI-Generated Artwork Won First Place at a State Fair Fine Arts Competition, and Artists Are Pissed



**Amira
Abdel-Rahman**

amiraa@mit.edu

**Valdemar
Danry**

vdanry@mit.edu

**Faraz
Faruqi**

ffaruqi@mit.edu

**Olivia
Seow**

olivias@media.mit.edu