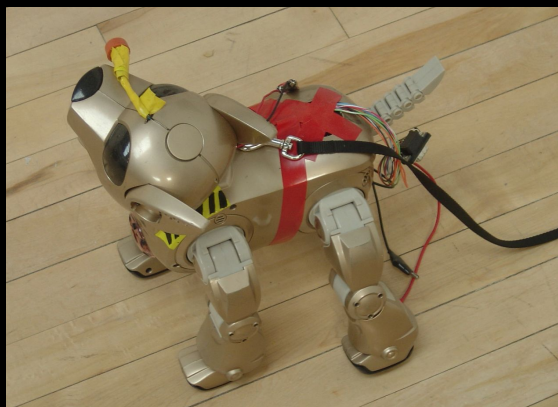
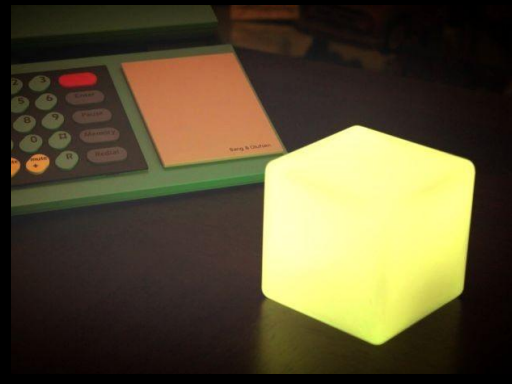


# AI, Computational Media, and Art

Robert Twomey, Ph.D.

Department of Visual Arts and Arthur C. Clarke Center for  
Human Imagination, University of California, San Diego  
[roberttwomey.com](http://roberttwomey.com) | [cohab-lab.net](http://cohab-lab.net)





clockwise from top left: 5T research magnet at [CSL, Georgetown](#); Scalable City from [EGL](#); [OrbNext IoT](#) circuit design; Feral Robotic Dogs with [N.Jeremijenko](#); Future Patient with [Larry Smarr](#);



Have you tried to rely while he is back.  
> No, but lets not talk about Uncle Billy. I want to ask you about a few  
use! I am preparing for this art show.  
>  
> Uncle Billy has been in Iraq for the reason of contemporary art show.  
> Yes, the contemporary art show. I am having trouble figuring out how to pro  
pose. Do you have any ideas?  
>  
> I don't really know what to propose.  
> Maybe you can give me advice on my ideas, how to break this region to sub  
an exciting project.  
>  
> Now I have been some kind of a full day, in the late afternoon, almost I  
did still have my ideas?  
> I want to build something sculptural, that occupies a large space, the size  
> of sixteen by eight feet tall, with a very material presence.  
>  
> Yeah. I hope that you had much of a full day, in  
the late afternoon, although I did still have my ideas?  
> I want this object to be both of entry into the other things that are happen  
> in the piece. It is the outside side.  
>  
> The vectors are being here. The things that are happening in the piece.  
It is the outside side.  
> TB.



Performance setup, from [Beyond Classification](#) (2021)

## On Plants, as Potential

A mushroom is the aerial manifestation of a larger infestation, its aboveground growth are a result of a set of instructions. Growing mushrooms in the fire-stricken forests of LA is a way to uncover the potential of the tenacious substratum of fungus.

====

A mushroom is the aerial manifestation of a larger infestation, its aboveground growth are a result of a set of instructions. These instructions are carried on the wind, in the soil, on the flies, on the berries, on the leaves, on the dog, on the baby. A mushroom's spores are light enough that they can be carried by the wind, or heavy enough that they can be picked up by an insect. The instructions are carried by the spores.

Growing mushrooms in the fire-stricken forests of LA is a way to uncover the potential of the tenacious substratum of fungus. Mushrooms are also implicated in the decomposition of organic matter, breaking down cellulose and lignin with the help of enzymes. The common white button mushroom is cultivated in moist, shaded locations on farms, but there are many fungi species that are native to the fire-stricken forests of LA that are capable of decomposing organic matter.

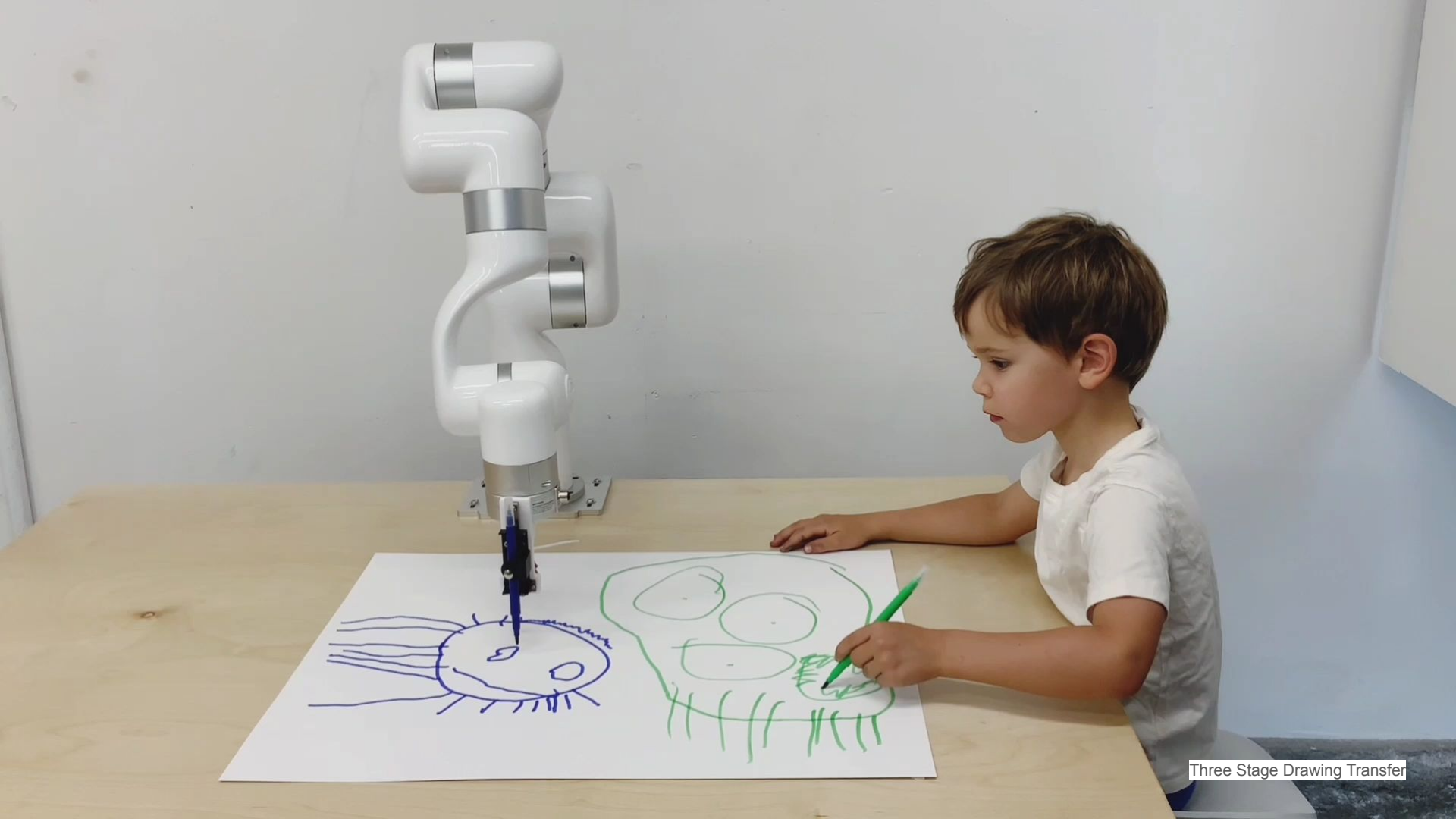
Mushrooms are the fruiting body of a larger organism, they are the part of the fungus that breaks through the earth.

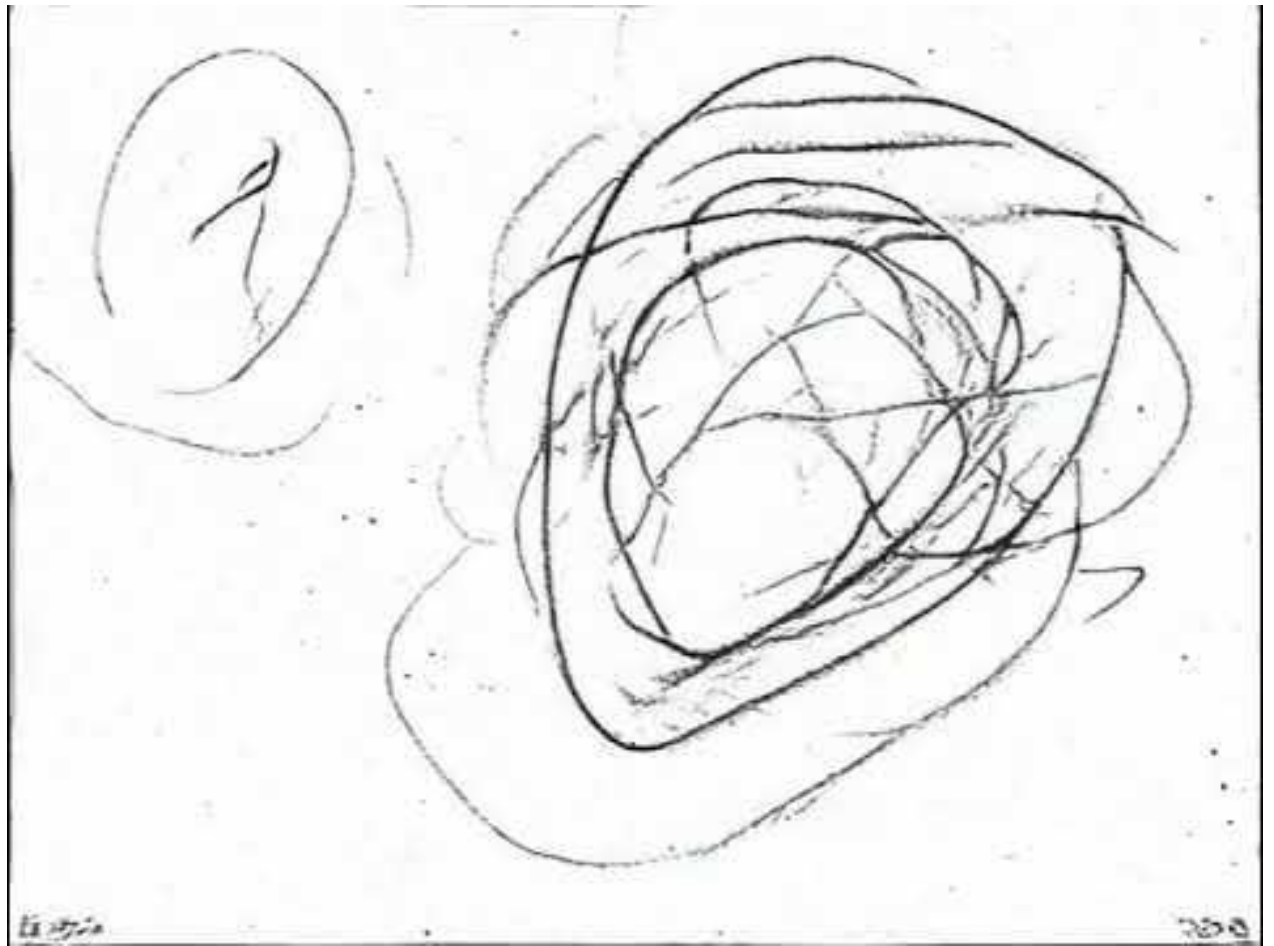
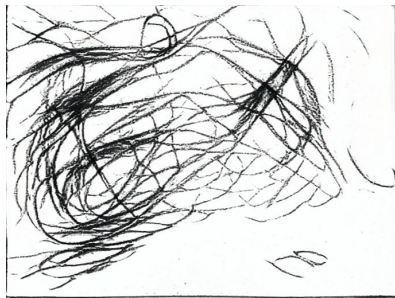
----> continued

Mushrooms are an example of a botanical feedback loop, where the growth of the organism is determined by the environment it inhabits. A human is also an example of a

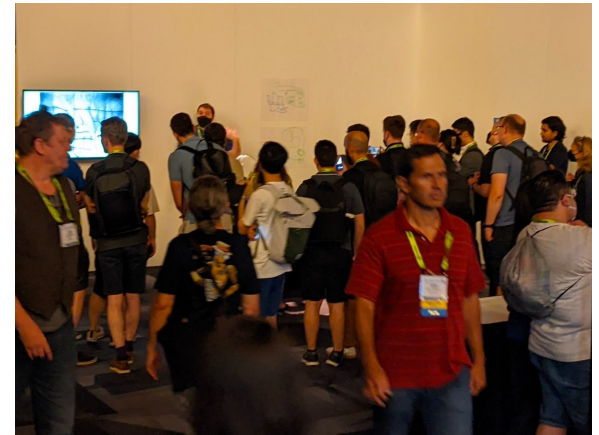


left: GPT-generated text; above: visual translations of key phrases (video)



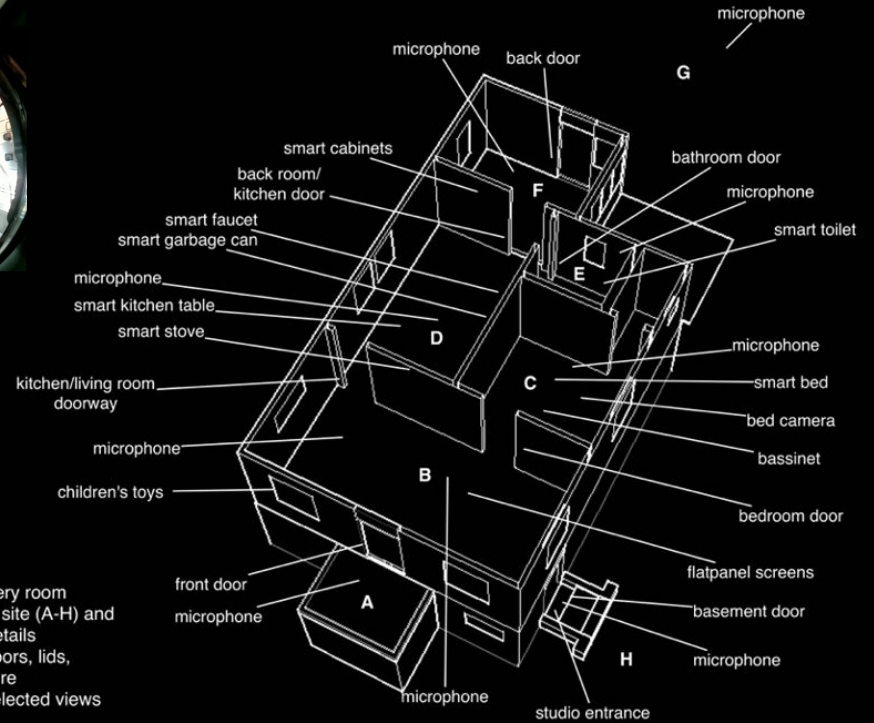


samples generated from fine-tuned StyleGAN-3; traversal of latent image space of GAN



Three Stage Drawing Transfer SIGGRAPH 2022



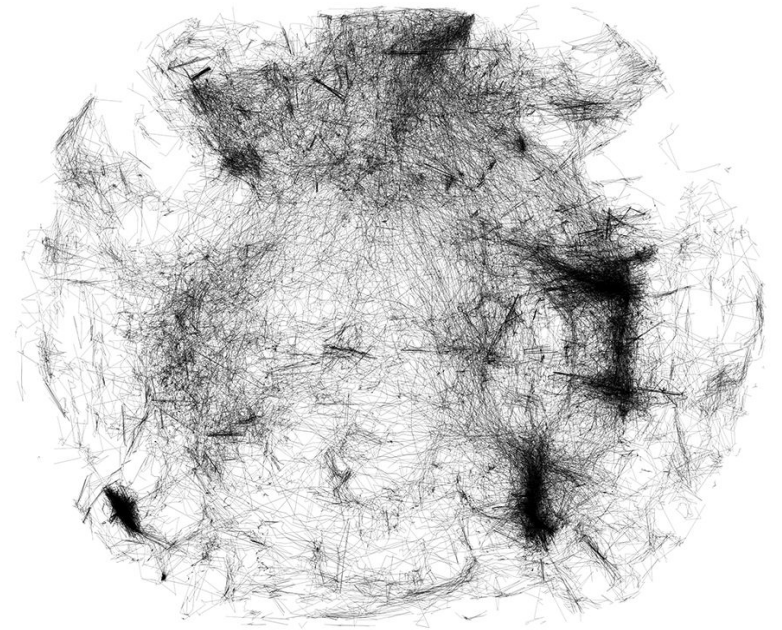
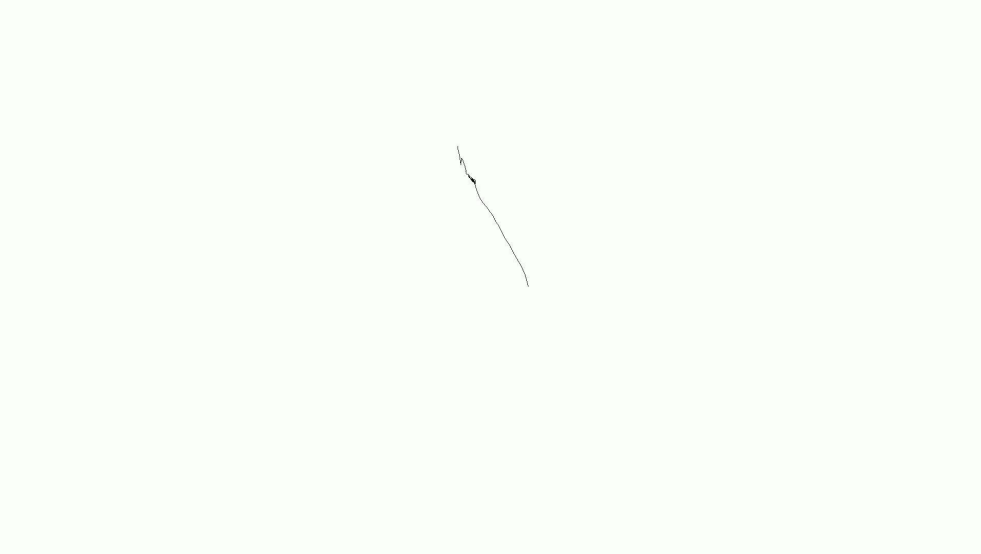


**TECHNOLOGIES**

doorway sensors  
 motion sensors in every room  
 microphones at each site (A-H) and  
 on selective details  
 motion sensors for doors, lids,  
 objects, furniture  
 cameras capturing selected views  
 in the space



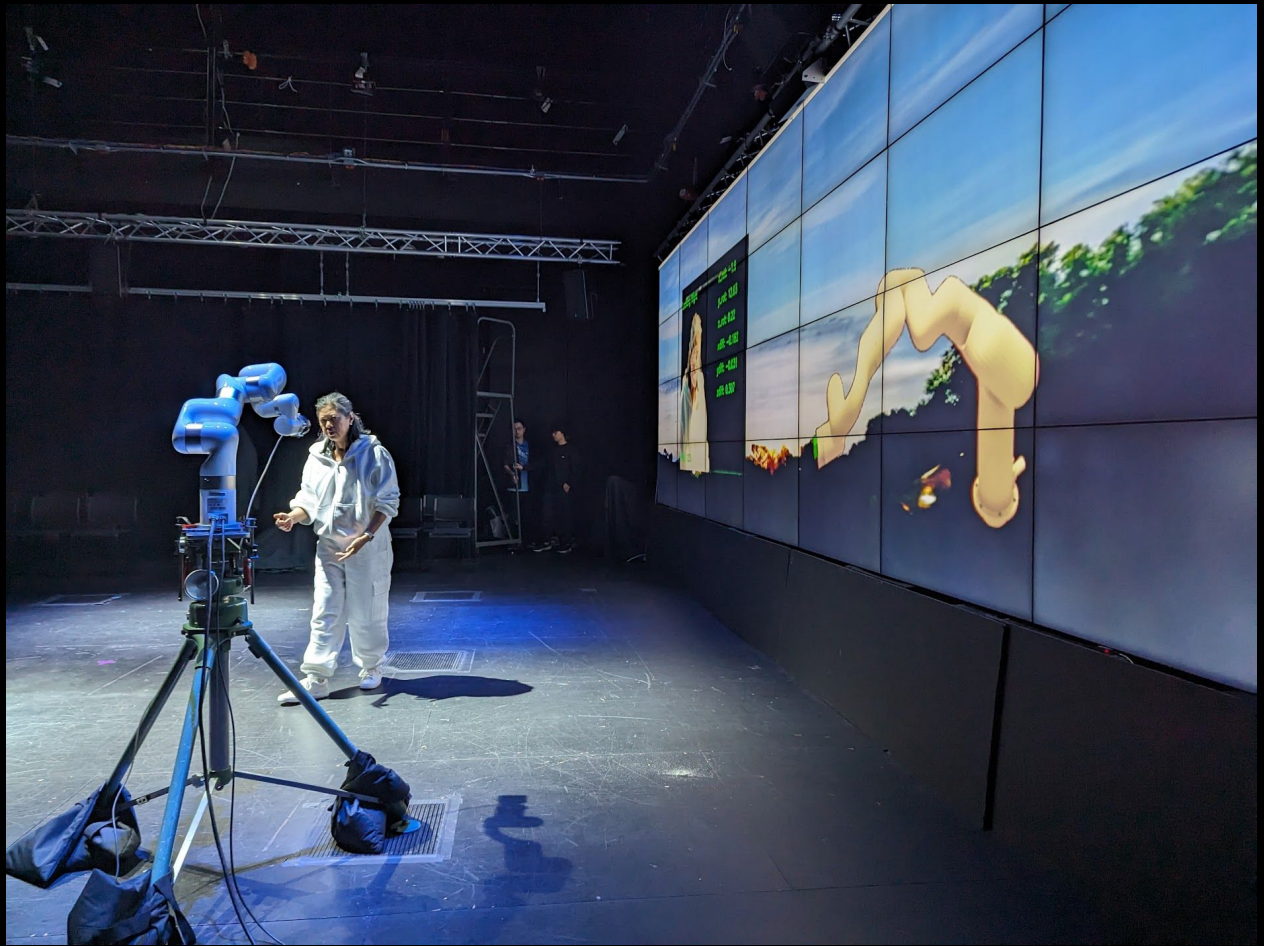
Overhead Tracking and Generative Video, [A Machine for Living In](#) (2018)



top left: extracted motion trails; above: motion trail drawing [A Machine for Living In](#)



Generative Dream Home, [A Machine for Living In](#) (2022)



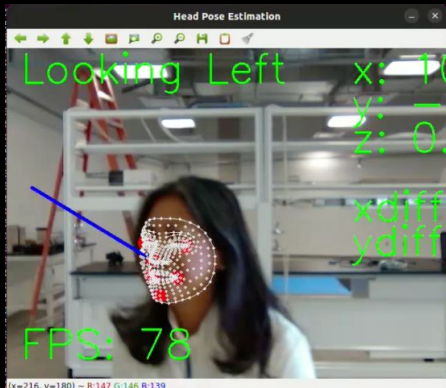
Beyond the Black Box (2024) with Hortense Gerardo and Amy Eguchi, QI IDEAS Series

## Generative Backdrops



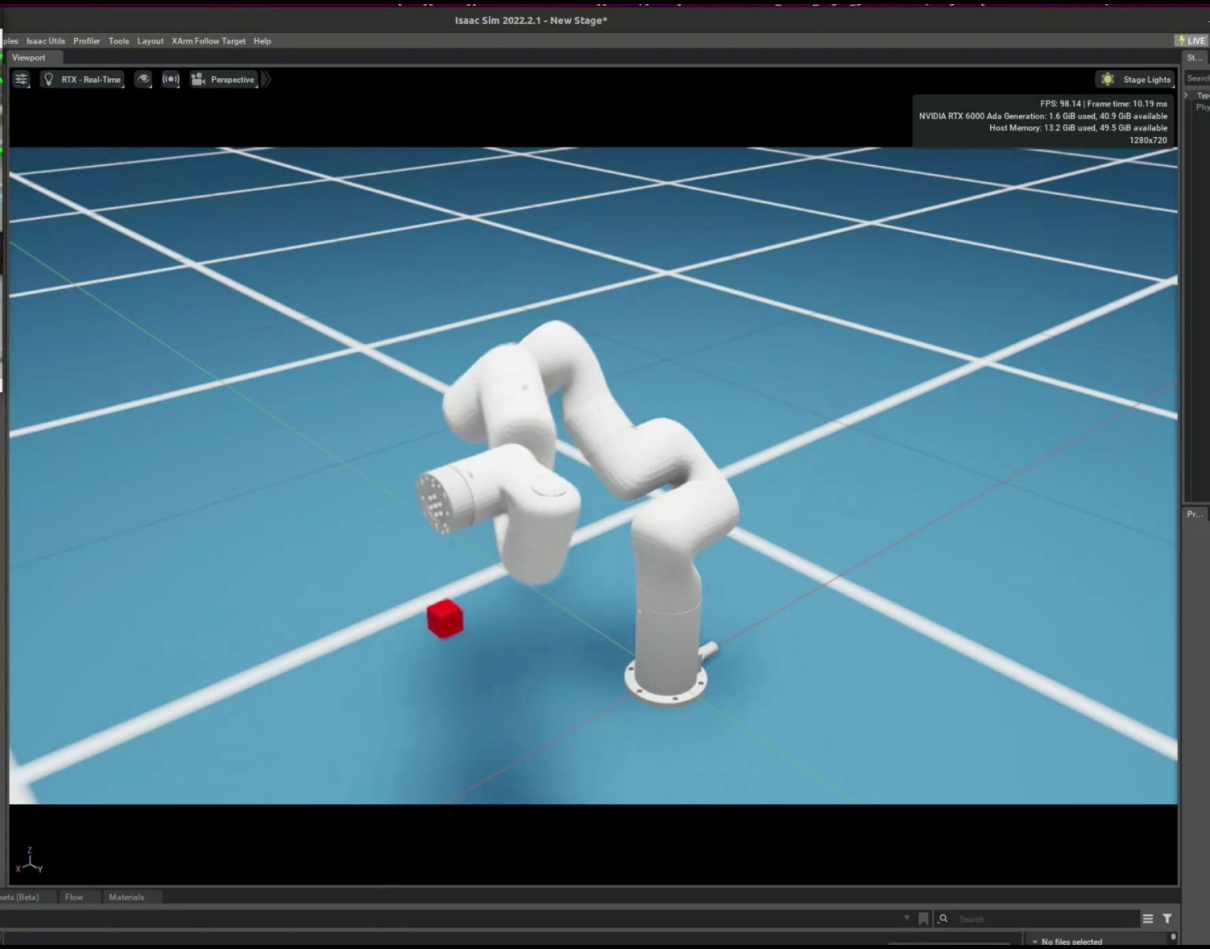
THE WALL GROUP





[-216, -100] - 8.147 0.146 0.139

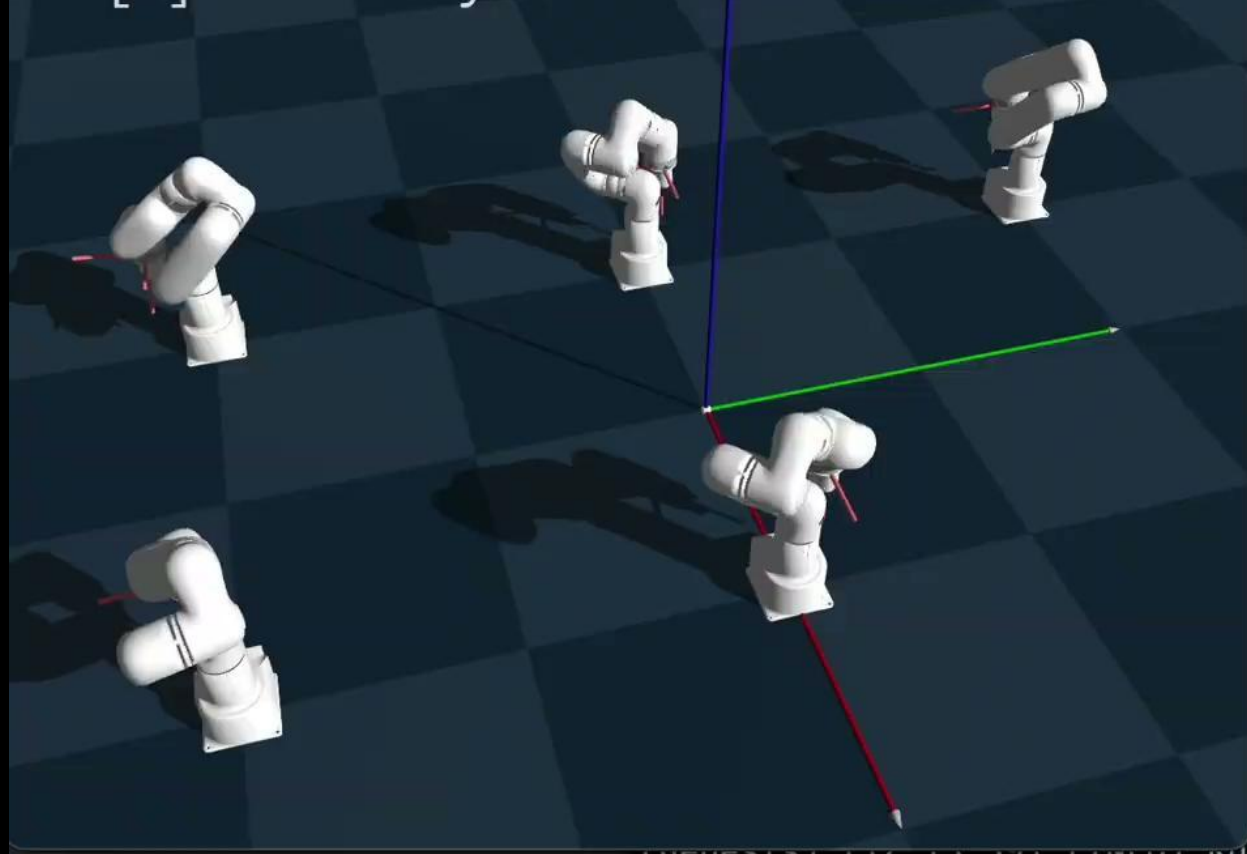
```
7.03559574e-06]] [[ [-240.00306751]
319.99747824]
540.05711132]]
fInq: [-1.061831761156344, 2.067331512
1.22668344e-04]
8.32680418e-05]
5.11604245e-06]] [[ [-240.00265641]
319.99792588]
540.08034963]]
fInq: [-2.530221481890961, 1.717518901
1.17391396e-04]
8.69641502e-05]
5.16186765e-06]] [[ [-240.00248133]
319.99780338]
540.07869733]]
fInq: [-2.4213768795126764, 1.79375685
1.53946857e-04]
1.25876176e-04]
5.33485622e-06]] [[ [-240.00250158]
319.99787505]
540.1021849 ]]
fInq: [-3.17539008686178, 2.592123393
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4.00320678e-04]
7.34258300e-07]] [[ [-239.99983322]
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539.87852876]]
fInq: [0.8278805807249744, -8.42221886
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7.59439365e-04]
2.12179080e-06]] [[ [-239.9989743 ]
320.00053392]
539.742336111]
```



Real-Time Interaction with Digital Double in NVIDIA Omniverse

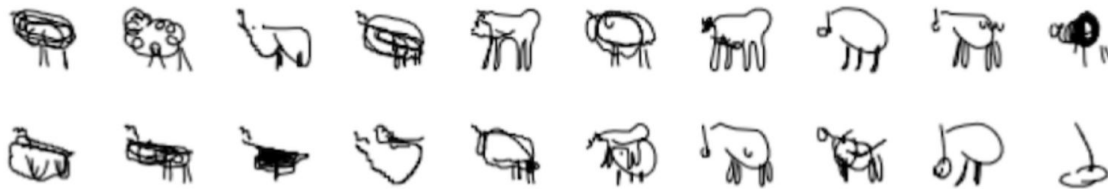


> [i]: show keyboard instructions



# EMAR 349: Machine Learning for the Arts - Spring 2024

<a href="#">Description</a>	<a href="#">Schedule</a>	<a href="#">Resources</a>	<a href="#">Grading</a>	<a href="#">Policies</a>	<a href="#">References</a>
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it's definitely an...

Tuesday focus on...

**Dreams**

Tuesday Friday, J...

1. Built shelves
2. Went to crackheads like we were in her neighborhood
3. I was at a Japanese memorial for WWII. It was very pretty. There was a crackhead. We went into a tomb and it was scary. I saw skulls and bones like we were in her neighborhood.

Monday June 18

(Pretty vivid memory) Started out in a lake with a group of people I didn't know. The scene in the water and we tested the water in different ways to somehow survive the trial. I started slow and got faster and faster. We ended in what I knew was a trap with everyone else. End.

Also: saw a monkey doing perfect sign language



Saturday June 19

(Not vivid memory) on vacation in what seemed like a European city with friends.

Sunday June 20

1. Built shelves above cupboards in kitchen and put all cereal above it. We were in her neighborhood.
2. Went to a Japanese memorial for WWII. It was very pretty. There was a crackhead. We went into a tomb and it was scary. I saw skulls and bones like we were in her neighborhood.

Stable Diffusion checkpoint

sd-v1-5-inpainting.ckpt [c6bbc15e32]

txt2img

img2img

Extras

PNG Info

Checkpoint Merger

Train

Deform

Dreambooth

Settings

Extensions

Painted graffiti on a wall depicting this dream: monkey doing perfect sign language

14/75

Generate

Negative prompt (press Ctrl+Enter or Alt+Enter to generate)

0/75

Generation

Textual Inversion

Hypernetworks

Checkpoints

Lora

Sampling method

DPM++ 2M Karras

Sampling steps

20

Hires. fix

Refiner

Stable Diffusion checkpoint

sd-v1-5-inpainting.ckpt [c6bbc15e32]

txt2img

img2img

Extras

PNG Info

Checkpoint Merger

Train

Defo

Painted graffiti on a wall depicting this dream: monkey doing perfect sign language

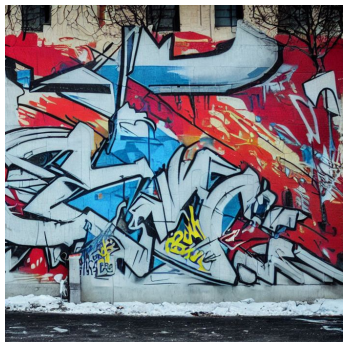
Negative prompt (press Ctrl+Enter or Alt+Enter to generate)



Painted graffiti on a wall depicting this dream: monkey doing perfect sign language  
Steps: 20, Sampler: DPM++ 2M Karras, CFG scale: 7, Seed: 3886428594, Size: 512x512, Model hash: c6bbc15e32, Model: sd-v1-5-inpainting, Conditional mask weight: 1.0, Version: v1.7.0



Micah Fullinaw, *Tag the Subconscious*, ML for the Arts, Johnny Carson Center for Emerging Media Arts, UNL 2023



Micah Fullinfaw, *Tag the Subconscious*, ML for the Arts, Johnny Carson Center for Emerging Media Arts, UNL 2023



Micah Fullinfaw  
"Tag the Subconscious, 2024"  
"Concrete Jungle" (Suno AI)

Micah Fullinfaw [Tag the Subconscious](#) (2024)



RSVP: <http://go.unl.edu/aifilm>



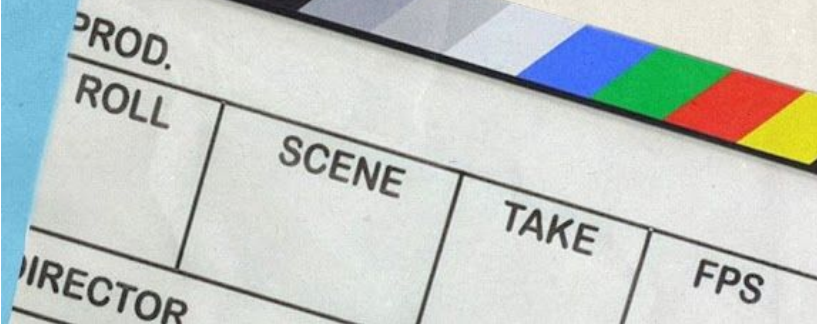
Co-hosted by  
The Johnny Carson Center  
+ Cinema 16

# AI FILM HACKATHON

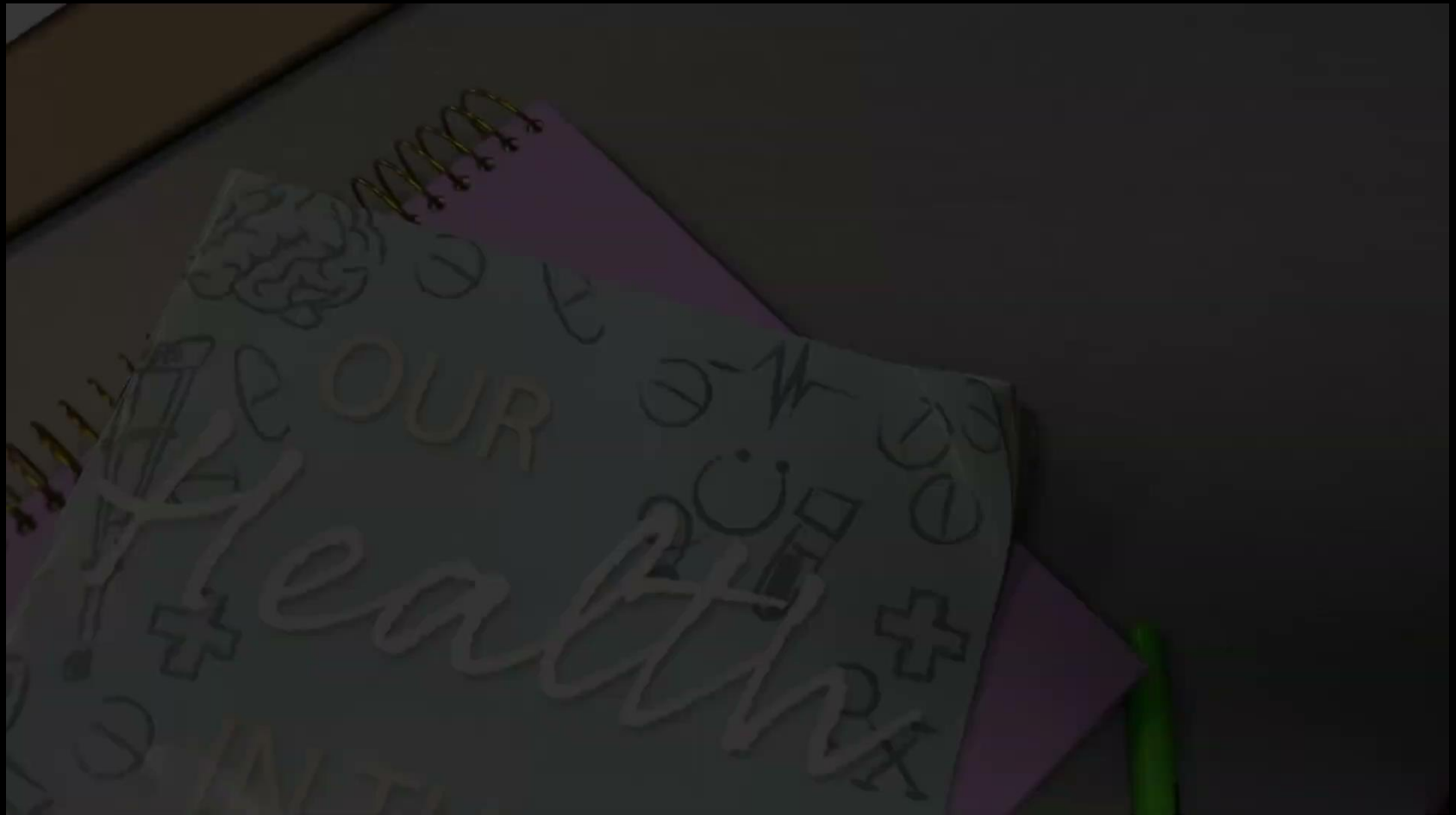
Spend the day creating a short film using AI technologies.  
NO EXPERIENCE NEEDED.

March 30 | 9:30am-7pm

FREE  
FOOD  
+  
GREAT  
AWARDS



JOHNNY CARSON CENTER  
FOR EMERGING MEDIA ARTS



EMA Faculty NovySan,  
Robert Twomey, and Ash Smith  
+ Cinema 16 Presents...



A Stable Diffusion Workshop  
March 29 | 12:30pm | Johnny Carson Center



**N** JOHNNY CARSON CENTER  
FOR EMERGING MEDIA ARTS



## A Stable Diffusion Workshop

*With Novy San, Robert Twomey and Ash Smith*

Friday, March 29th @ 12:30pm-2:00pm

CEMA Room #101E

Food Provided

### Activities:

Hands-on and Deep Dive with Stable Diffusion on Nautilus.

Hack-a-thon Q&A

Stable Diffusion checkpoint  
sd-v1-5-inpainting.ckpt [c6bbc15e32]

txt2img img2img Extras PNG Info Checkpoint Merger Train Deforum Settings Extensions

a penguin in a bikini sunbathing on the beach photorealistic film 35mm 15/75

Negative prompt (press Ctrl+Enter or Alt+Enter to generate) 0/75

Generate

Generation Textual Inversion Hypernetworks Checkpoints Lora

Sampling method DPM++ 2M Karras Sampling steps 20


Hires. fix Refiner

Width 512 Batch count 1

Height 512 Batch size 1

CFG Scale 7.5

Seed



Automatic 1111 running Stable Diffusion v1.5 on Nautilus (!!! big thankyou to Derek Weitzel !!!)



Untitled by Calvin Doerr and Cade Suing (2024)

# Fluids, Feathers, & Flight: Codex ex Machina

Live AI Radio Theater Inspired by Leonardo Davinci's Flying Machines and Notebook Observations with the Other Lifelong Learning Institute and Nebraska Public Media by Ash Elza Smith + Robert Twomey. Live Scoring by Jim Schroeder and co-created by student and alumni researchers from the Johnny Carson Center for Emerging Media Arts.

Jan 23 5:30-7PM

Sheldon Museum of Art  
Auditorium - Lincoln, NE



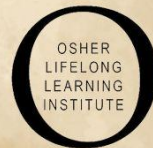


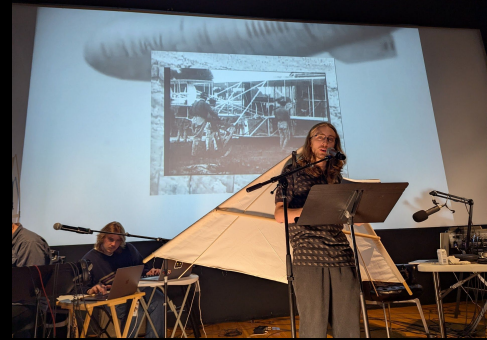
# ART & THE MACHINE

A LIVE RADIO THEATER EVENT INSPIRED BY

# LEONARDO "DA VINCI"

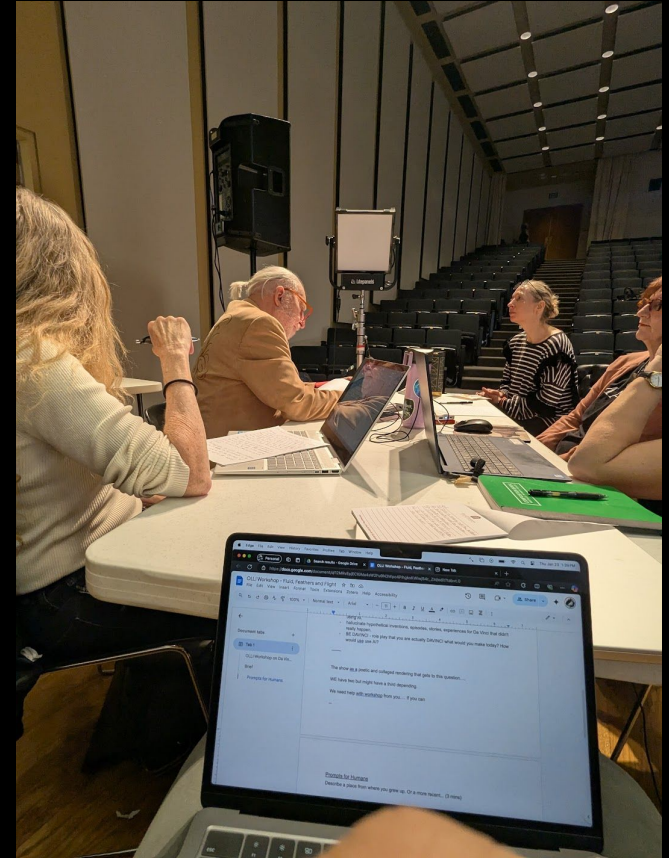
A FILM BY KEN BURNS,  
SARAH BURNS AND DAVID McMAHON





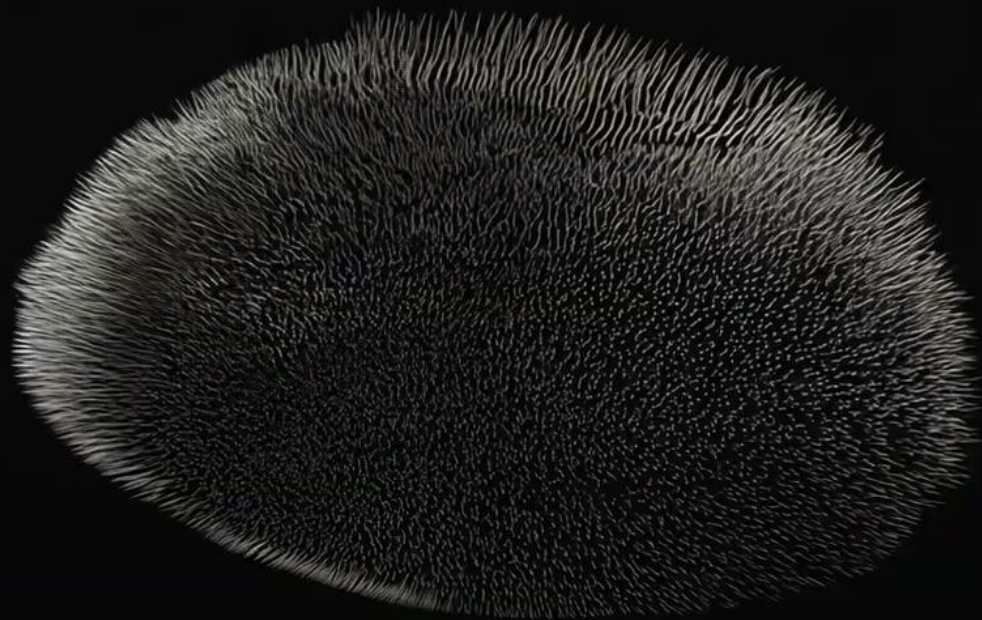






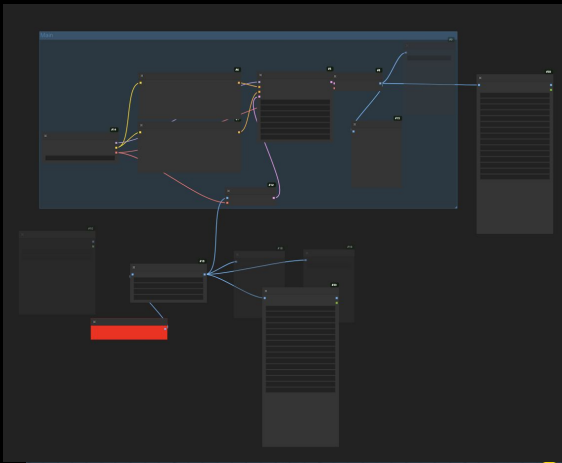
AI Writer's Room with participants from the Osher Lifelong Learning Institute (OLLI) - University of Nebraska-Lincoln











● Load Checkpoint

- MODEL ●
- CLIP ●
- VAE ●

◀ ckpt\_name epicrealismXL\_v8Kiss.safete... ▶

#14

● CLIP Text Encode (Prompt)

● clip

CONDITIONING ●

flying machine, highly detailed Leonardo da Vinci-style sketch, Emphasize intricate, made of wood, mechanical details, such as gears, pulleys, and wing structures, with annotations in a handwritten Renaissance-style script. Use a sepia-toned parchment background, adding visible creases and a weathered texture to evoke the look of an aged sketchbook. Incorporate shading and hatching techniques typical of da Vinci's drawings to add depth and dimension. The overall aesthetic should feel inventive, imaginative, and authentically from the 15th century.

● CLIP Text Encode (Prompt)

● clip

CONDITIONING ●

watermark, text, naked woman, breasts, nude, porn, lude, sexy

#6

● KSampler

- model
- positive
- negative
- latent\_image

LATENT ●

- ◀ seed 96291918239588 ▶
- ◀ control\_after\_generate randomize ▶
- ◀ steps 25 ▶
- ◀ cfg 5.5 ▶
- ◀ sampler\_name dpmp3\_3m\_sde\_gpu ▶
- ◀ scheduler karras ▶
- ◀ denoise 0.69 ▶

#3

● VAE

- samples
- vae

#12

● VAE Encode

- pixels
- vae

LATENT ●

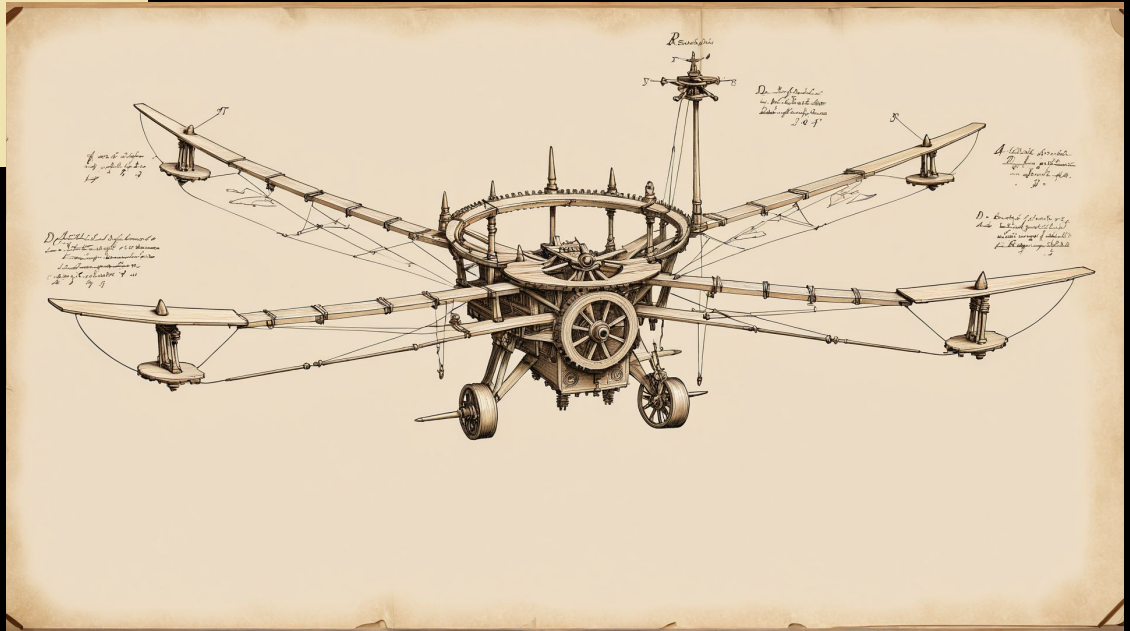
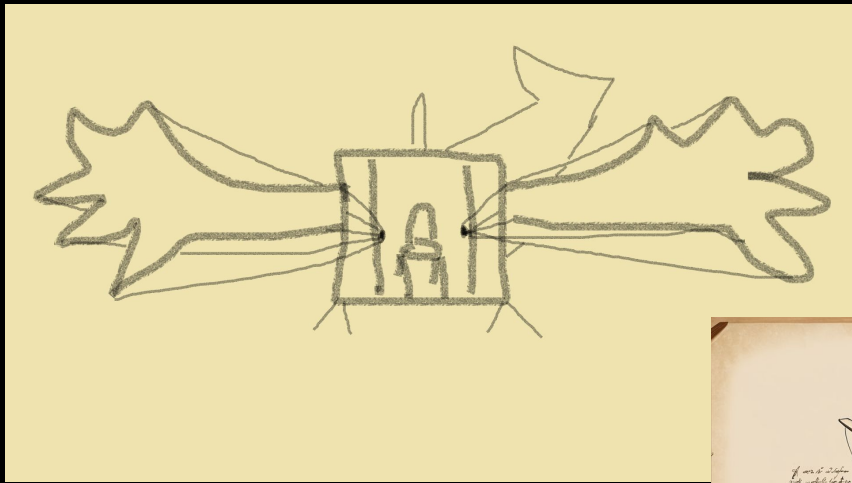
# ComfyUI

T: 0.00s

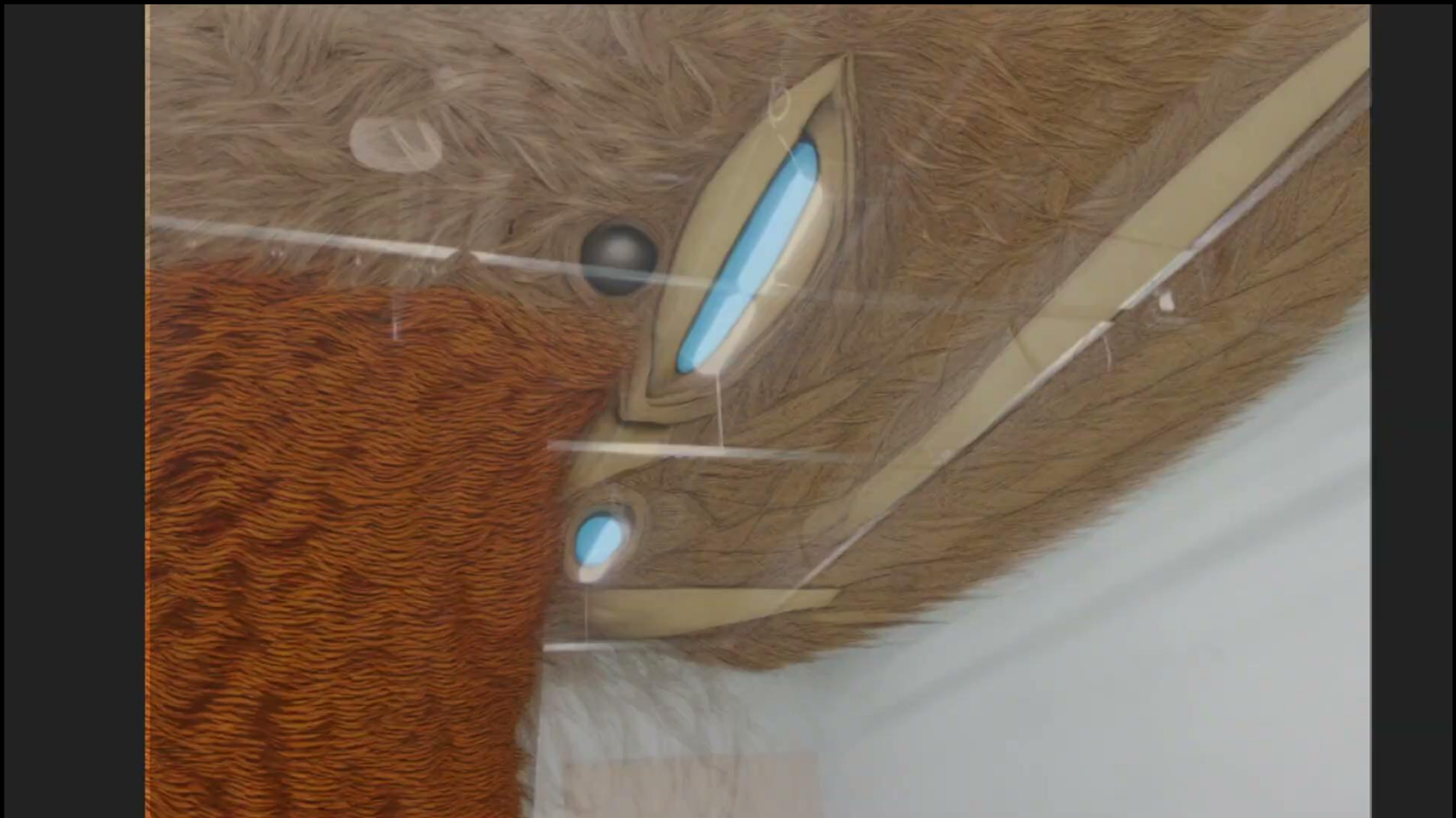
▲ [5]

V: 31

FPS: 60.24







# Conclusions

# AI's use in art, movies gets a boost from Copyright Office

Today at 8:57 a.m. EST

🔒 6 min 📌 📄 6



Analysis by **Will Oremus**  
with research by Andrea Jiménez

**Happy Thursday.** Our thoughts are with those affected by the [plane crash](#) in Washington. Send news tips to: [will.oremus@washpost.com](mailto:will.oremus@washpost.com).

**AI's use in art, movies gets a boost from the U.S. Copyright Office**



A still from an AI-generated video created by Davide Bianca and displayed on escape.ai. (Davide Bianca/escape.ai)

**The key to copyrightability, the report finds, is human creativity.**

“Where that creativity is expressed through the use of AI systems, it continues to enjoy protection,” said **Shira Perlmutter**, Register of Copyrights and Director of the U.S. Copyright Office, in a statement. But merely prompting an AI system to generate a given output isn’t enough to merit copyright protections.

Here’s how Cornell Law professor **James Grimmelmann** interpreted the report’s main takeaway: “If you make art with the help of AI, it’s copyrightable. If you ask AI to make art for you, it’s not.”

While it isn’t legally binding, the report provides expert guidance that judges and policymakers may find persuasive, Grimmelmann said.

Its findings may deflate those hoping for new copyright protections for AI-generated material, but they also help “assure people they won’t lose copyright just because they use AI as part of the creative process.”

Thank you!

roberttwomey.com  
cohab-lab.net



Overhead Tracking and Generative Video, [A Machine for Living In](#) (2018)