

TAMING CHAOS

GENERATIVE MODELING AS A FOIL TO HUMAN CREATIVITY

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Generated w/ Disco Diffusion 5.0 by [SOMNAI](#), for title prompt + "Thomas Kinkadee"



Adverb

@advadnoun



We did it. We finally killed art 😁

3:22 PM · Jul 9, 2021 · Twitter for Android

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by Ryan Murdock, creator of "[The Big Sleep](#)"

In Summer 2021, it seemed to me that within 6-8 months, (prompt-based) generative art would become the main pastime of everyone in America

My main question:

"Why are we not all generating art all the time now?"



Scott H. Hawley

Professor of Physics (and singer-songwriter)

Belmont University, Nashville

Main Research: Machine Learning + Musical Audio

Questions

What are the roles of...

- spontaneity & inspiration
- method & process
- purpose/intentionality & control
- communication
- emotion (joy, anguish,...)
- personal style

...in artistry?

(visual art, music, poetry, novels,...)

Foil (narrative)

Character who contrasts with another character of a narrative work



In any narrative, a foil is a character who contrasts with another character; typically, a character who contrasts with the protagonist, in order to better highlight or differentiate certain qualities of the protagonist. A foil to the protagonist may also be the antagonist of the plot.

Wikipedia

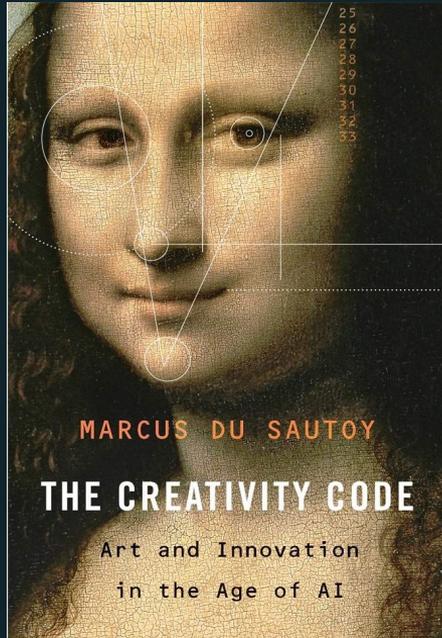
"foil" for human creativity

"4. a person or thing that contrasts with and so emphasizes and enhances the qualities of another"

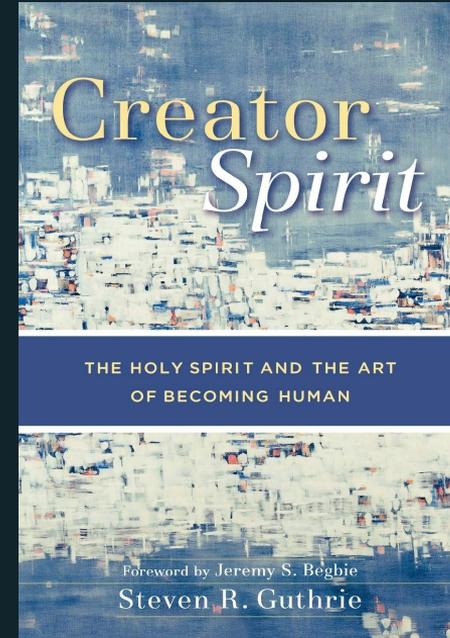
Etymology: The word *foil* comes from the old practice of backing gems with foil to make them shine more brightly.

Two potential "partners" for human creativity

du Sautoy: A.I.



Guthrie: Holy Spirit



["Review of *The Creativity Code: Art and Innovation in the Age of AI* by Marcus du Sautoy"](#) by S.H. Hawley, *Perspectives on Science and Christian Faith*, 72:1, p.52 (March 2020) .

Two potential "partners" for human creativity

du Sautoy: A.I.

*"To pass the **Lovelace Test**, an algorithm has to produce something that is truly creative*. The process has to be repeatable...and the programmer has to be unable to explain how the algorithm produced its output."*

creative: **new, **surprising**, and **of value**.*

"[f]or a machine to be deemed truly creative, its contribution has to be more than an expression of the creativity of its coder or the person who built its dataset."

Guthrie: Holy Spirit

*..as **Surprise-Bringer**: "What is more, the spirit also brings about **new** and altogether **unexpected** states of affairs."*

*The **Gift-Giving Spirit**: "'These...spontaneous and temporally limited gifts [are] conferred on individuals for the whole people.' In the same way the Spirit gives **gifts** to the church..."*

Removing human agency?

Plato: the divine (in *Ion*) vs. Guthrie: Holy Spirit

"This is the common ground between the Platonic and postmodern accounts...: both present a fundamentally competitive 'theology' with respect to human action. Where the transcendent is active, the human artist is inactive. Where the human is at work, the transcendent cannot be expressed."

"What is far more troubling is that, by stripping the artist of her voice, both *Ion* and postmodern critical theory offer an account of the arts that is ultimately dehumanizing."

"The Christian doctrine of the Holy Spirit is not only *other* than the vision of both *Ion* and the postmodern, it is the *antidote* to *Ion* and the postmodern."

"Taming Chaos"

For A.I.,

This was my word for the random noise initialization of models, which the neural network then learns to remap.

"Taming": NN learns to *transform* the *probability distribution* of the *noise spectrum*.

Guthrie: The Defeat of Chaos

*"...we could say that in its remembered past, in its expected future, and in the presence of Jesus Christ, Christianity tells the story of the **defeat** of **chaos**."*

chaos: formless void "tohu wabohu"

*"The modern sublime suggests that **form** cannot contain what is ultimate. The **postmodern sublime** says that **form is a lie** in a world of **chaos**. The New Testament, however, asserts that in Jesus Christ the infinite has indeed taken **form**....(1 John 1:1-2)."*

History: Generative Art Games

Mozart: *Musikalisches Würfelspiel*

Table des Chiffres pour le Walzer.
Zahlentafel für den Walzer.

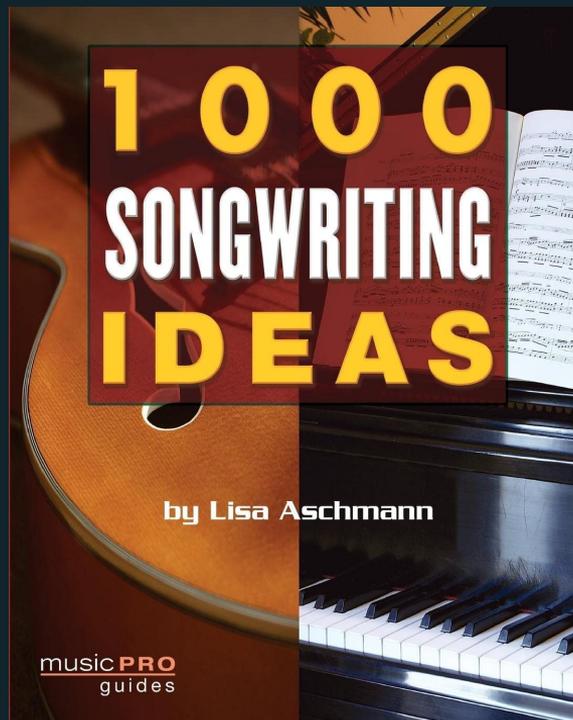
Première Partie.
Erster Theil.

	A	B	C	D	E	F	G	H
2	96	22	141	41	105	122	11	30
3	32	6	128	63	146	46	134	81
4	69	95	158	13	153	55	110	24
5	40	17	113	85	161	2	159	100
6	148	74	163	45	80	97	36	107
7	104	157	27	167	154	68	118	91
8	152	60	171	53	99	133	21	127
9	119	84	114	50	140	86	169	94
10	98	142	42	156	75	129	62	123
11	3	87	165	61	135	47	147	33
12	54	130	10	103	28	37	106	5

Seconde Partie.
Zweiter Theil.

	A	B	C	D	E	F	G	H
2	70	121	26	9	112	49	109	14
3	117	39	126	56	174	18	116	83
4	66	139	15	132	73	58	145	79
5	90	176	7	34	67	160	52	170
6	25	143	64	125	76	136	1	93
7	138	71	150	29	101	162	23	151
8	16	155	57	175	43	168	89	172
9	120	88	48	166	51	115	72	111
10	65	77	19	82	137	38	149	8
11	102	4	31	164	144	59	173	78
12	35	20	108	92	12	124	44	131

Lisa Aschmann (former astrophysicist!)



History: Intentionality, Process

Near-worthless (once discovered):



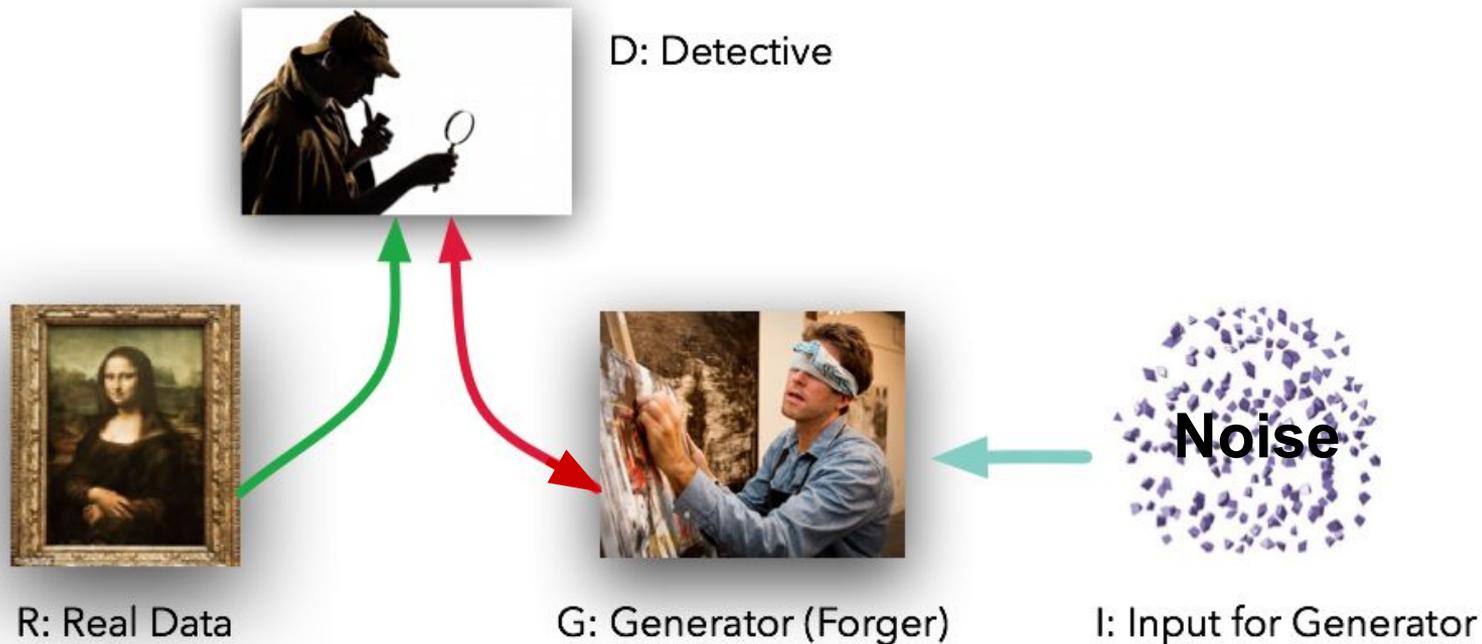
Sunset Over the Adriatic (1910)
by a donkey named Lola

"One of the masters of 20th Century Art":

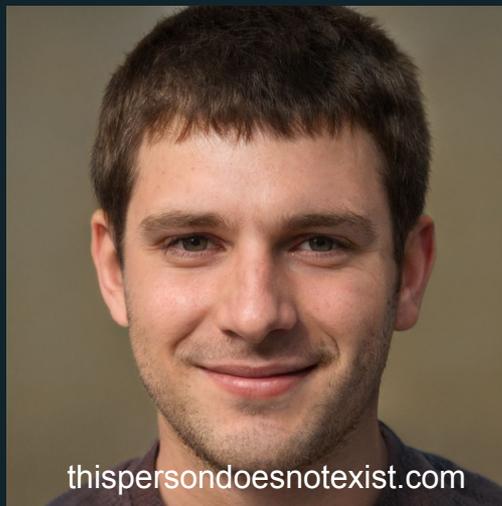


Blue Poles (1952)
by Jackson Pollock

Generative Adversarial Networks (GANs)



A few GAN applications



homework in my DL class

WaveGAN Demo

Chris Donahue, Julian McAuley, Miller Puckette

This is a demo of our WaveGAN method trained on drum sound effects ([paper](#), [code](#)). All drum sounds are synthesized in browser by a neural network.

Shortcuts: Keys 1-8 play sounds. Shift+[1-8] changes sounds. Space starts/stops sequencer.

Volume Reverb

Drum 1	Drum 2	Drum 3	Drum 4
Change Save	Change Save	Change Save	Change Save
Drum 5	Drum 6	Drum 7	Drum 8
Change Save	Change Save	Change Save	Change Save

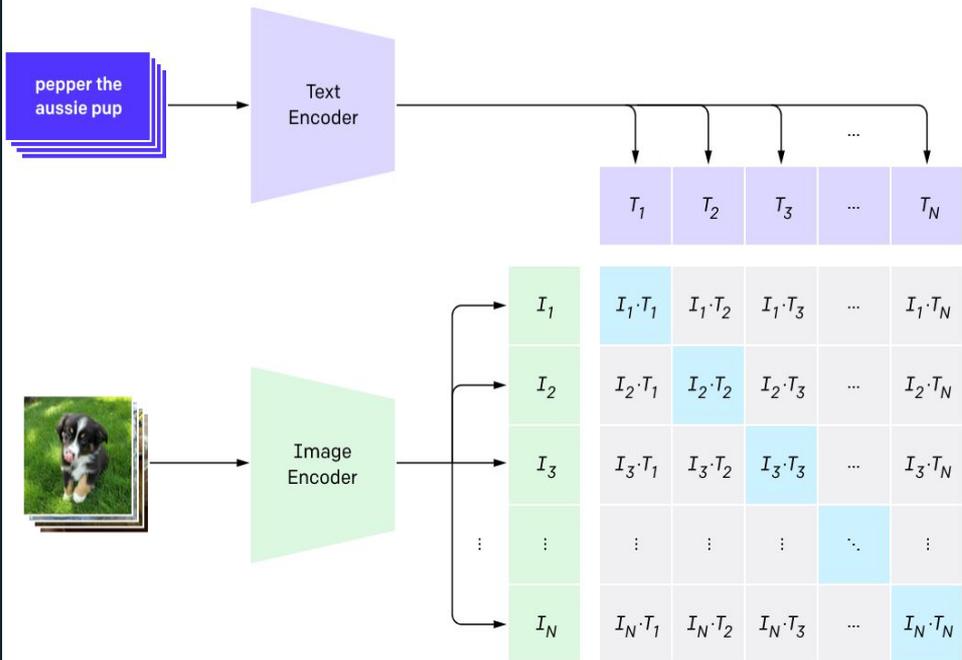
Play Stop Clear Tempo Swing

Drum 1															
Drum 2															
Drum 3															
Drum 4															
Drum 5															
Drum 6															
Drum 7															

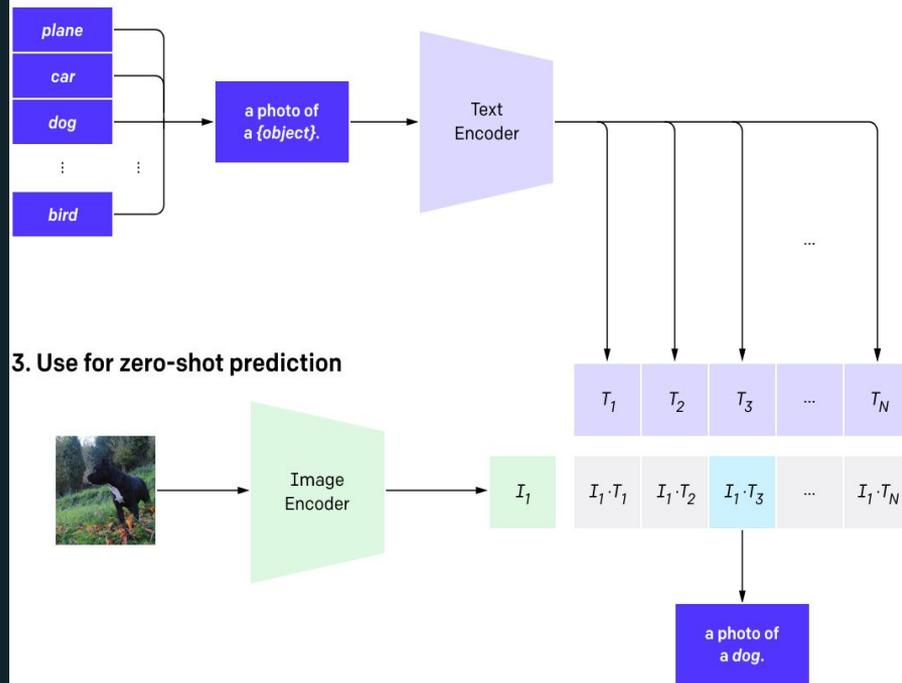
Contrastive Language-Image Pretraining (CLIP)

(OpenAI)

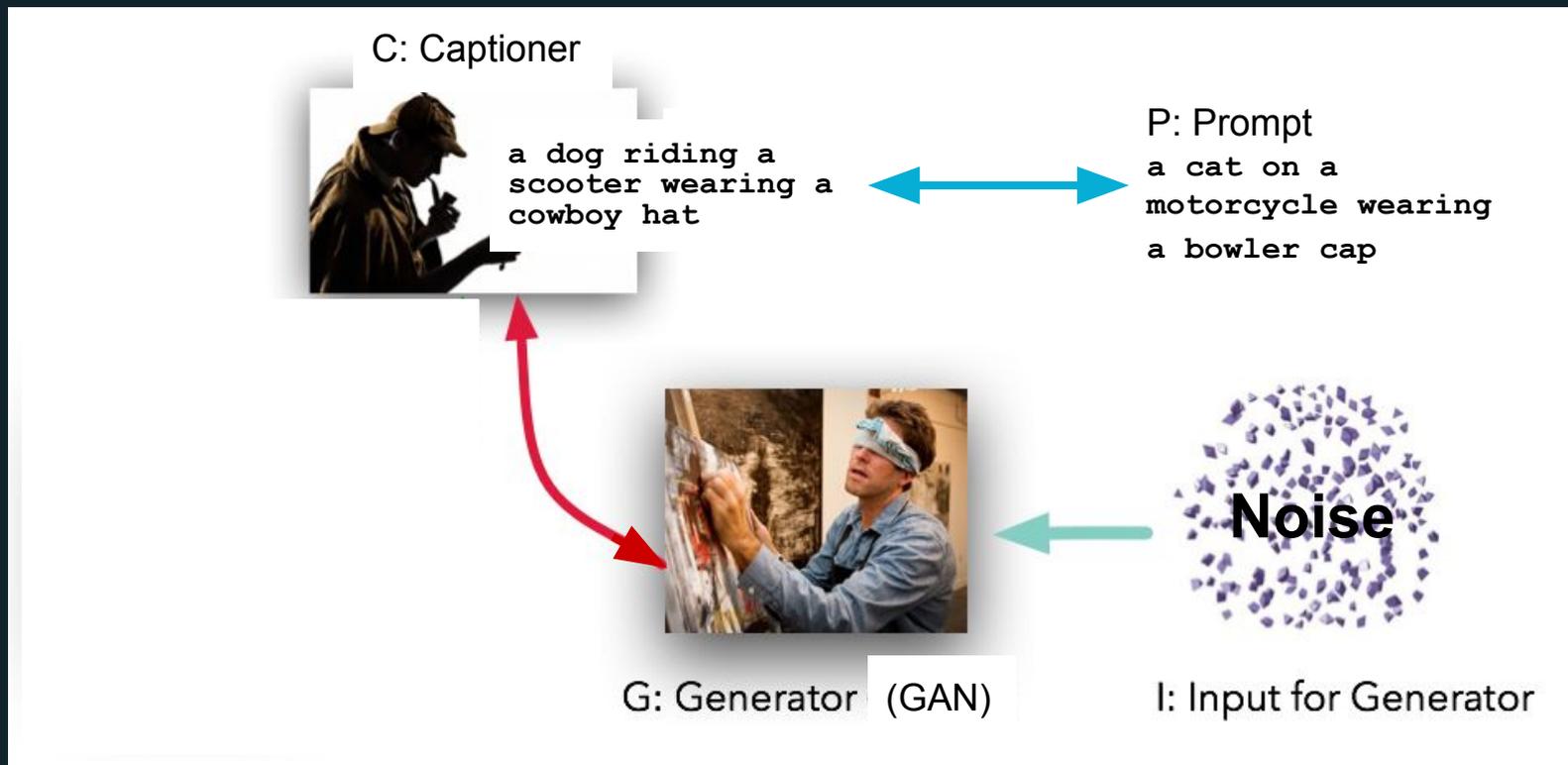
1. Contrastive pre-training



2. Create dataset classifier from label text



CLIP+...



"CLIP+VQGAN"...art I've generated:

Preface: Follow...

Katherine Crowson, @RiversHaveWings

Ryan Murdock, @Advadnoun

Mario Klingemann, @quasimondo

...others

Also, cf. <https://aiartists.org/generative-art-design>

Gallery:

(my IG: @xaltint)



"Ansel Adams, trending on Artstation"



"The Grumpy Cat Nebula"



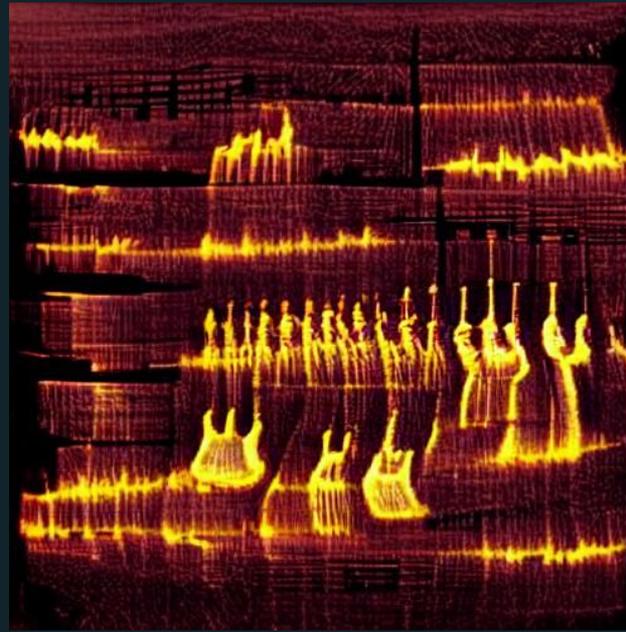
"The Dance Macabre"

Gallery:

(IG: @xaltint)



"Hogwarts; daguerreotype"



"mel-spectrogram of electric guitar sound"



"The Great Wave off Kanagawa,
in Chocolate"

Gallery:

(IG: @xaltint)



"Action figures performing a Shakespearean play; diorama; depth of field; medieval"



Adverb

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Scott H. Hawley

@drscotthawley



Replying to [@advadnoun](#)

My mom, someday soon: "Isn't our son talented? He actually wrote the PROMPT for this!" 😂

5:57 PM · Jul 9, 2021 · Twitter Web App

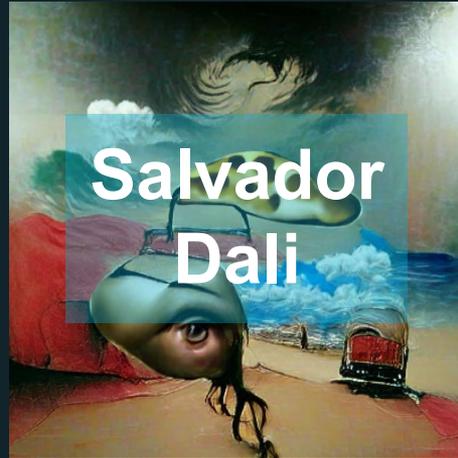
12 Likes

Gallery: "Here is your pizza"

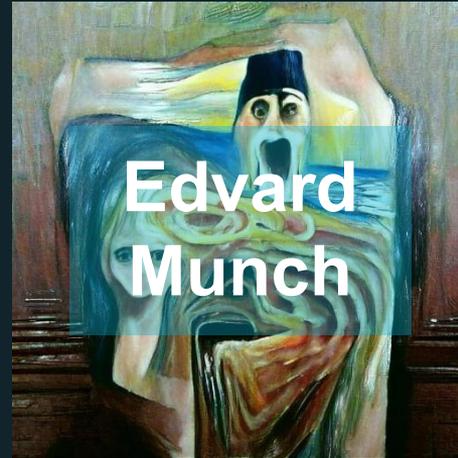
(IG: @xaltint)



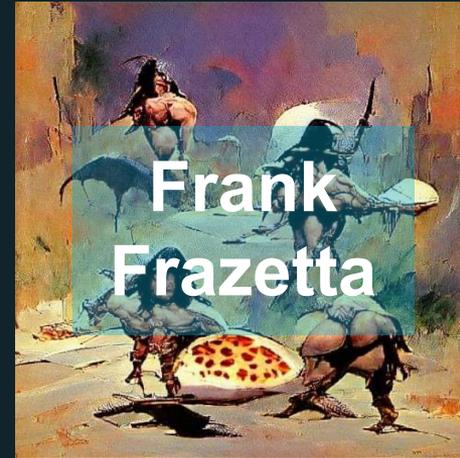
John
Berkey



Salvador
Dali



Edvard
Munch



Frank
Frazetta



Cave
Art



Banksy



Rembrandt



???

We can easily ~~appropriate~~ interpolate between them...



...To varying degrees

More interesting/problematic:
Use artists who aren't household names...

Gallery:

(IG: @xaltint)



"Hope Amid Loneliness; in the style of Caspar David Friedrich"



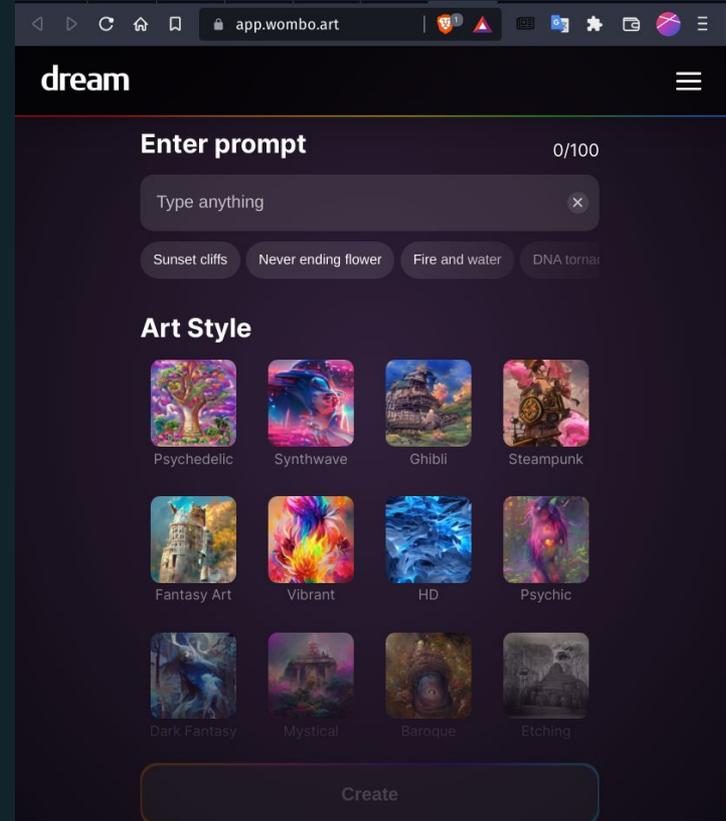
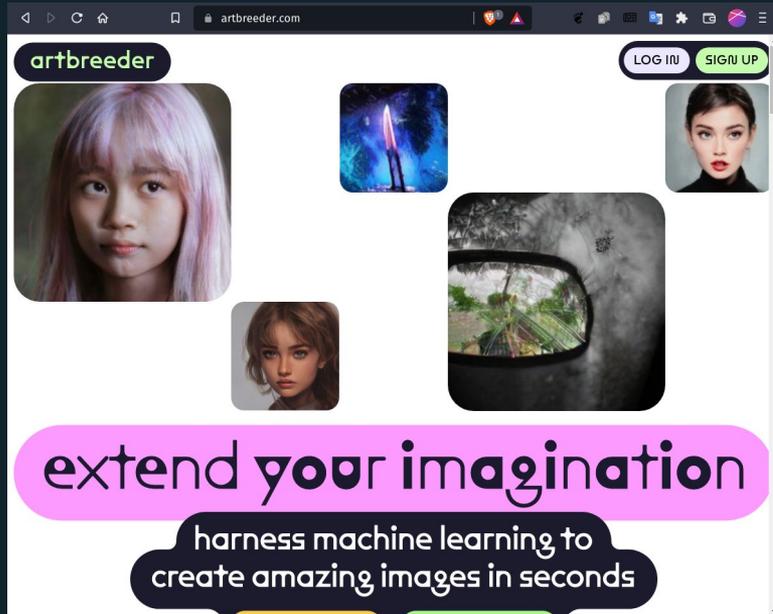
"Peruvian market, in the style of Leonid Afremov"



"Hi [James](#) how's it going? in the style of Odilon Redon"

Confession: These artists' *names* & life's works became *mere commodities* to me.

My main question: "Why are we not all generating art all the time now?"



Generative Music

- Folk-RNN
- Tools from [Google Magenta](#)
- OpenAI's JukeBox
- ...DadaBots!
- The AI Song Contest



DadaBots!

"Relentless Doppelganger"

Harnessing JukeBox



Related to Main Question:

Why aren't more people using AI-music generation tools?

Why hasn't AI-music "taken off"?

"Fake (AI) Ivan Illich"

...as a 'prank' to L.M. Sacasas, [@LMSacasas](#)

I fed the model "GPT-3" a mere 4 to 8 examples of real Illich quotes, then had it generate 365 Fake-Illich-a-Day quotes that are surprisingly plausible:

"Prior to the Industrial Revolution, the structure of families and households ... was the principal source of energy supply for our civilization."

"The history of industrial technology is the history of the rejection of human scale."

"The bureaucrat is the technical expert who carries out the organizational goals that he is supposed to serve."

"It is the business of the future to be dangerous."

"If the bureaucrat is not a servant, he must be a master. If he is not a tool, he must be a monster."

"The bureaucratic system is not an efficient one: It is based on the assumption that, if the task to be done is defined and all the steps of its execution are specified, its accomplishment will be assured. This assumption is false: it fails to take into account the ingenuity, creativity, imagination, and improvisation that people will naturally bring to their own work."

"The primary function of mass media is to divert our attention from important things."

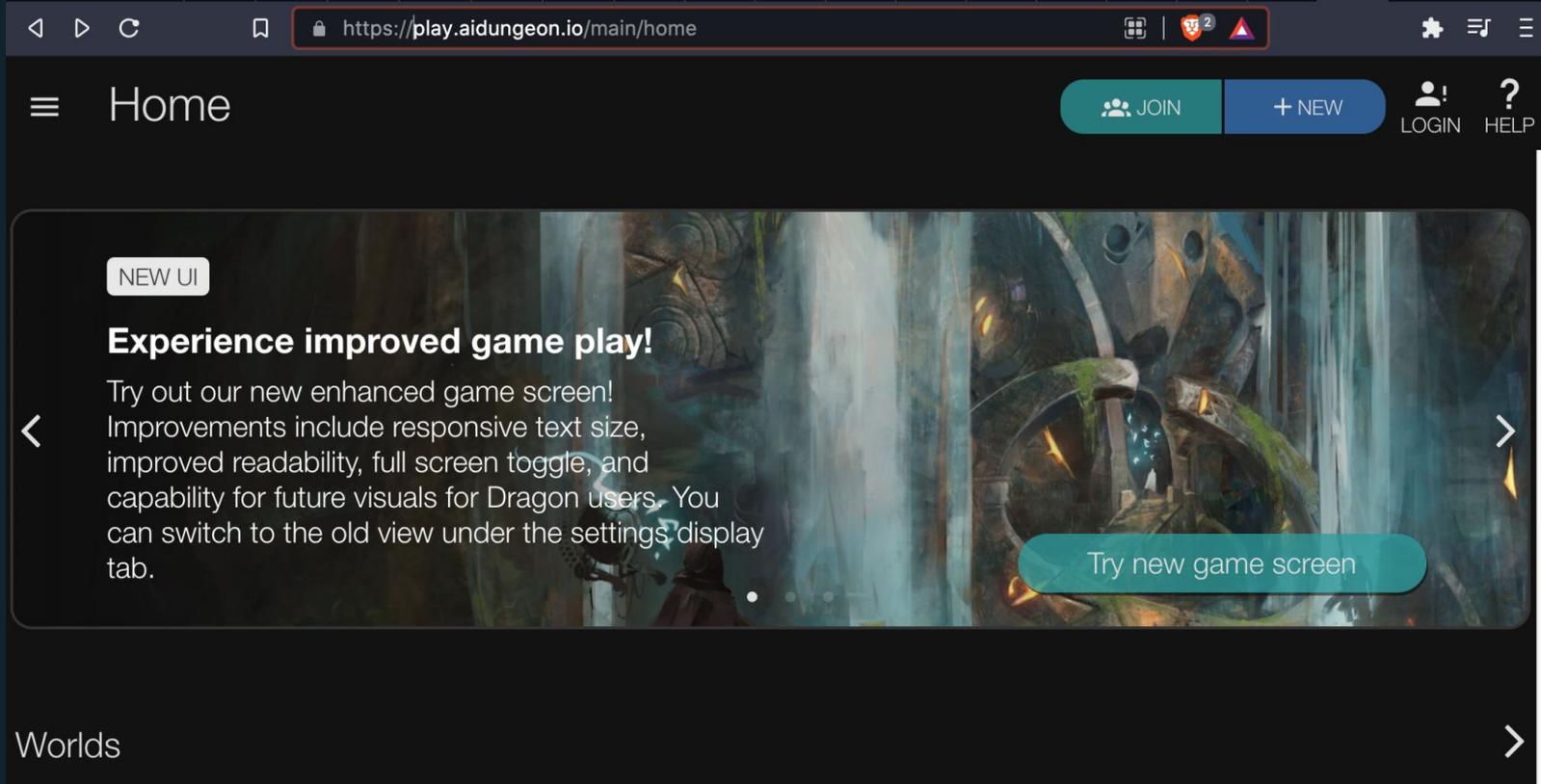
AI Textual Helpers for Humans

<https://www.sudowrite.com/>



Interactive Narrative: “AI Dungeon”

<https://play.aidungeon.io/>



The screenshot shows the home page of the AI Dungeon website. At the top, there is a navigation bar with a hamburger menu icon, the word "Home", and buttons for "JOIN", "+ NEW", "LOGIN", and "HELP". Below the navigation bar is a large banner with a background image of a fantasy dungeon. The banner contains a "NEW UI" badge, the heading "Experience improved game play!", and a paragraph of text: "Try out our new enhanced game screen! Improvements include responsive text size, improved readability, full screen toggle, and capability for future visuals for Dragon users. You can switch to the old view under the settings display tab." A teal button labeled "Try new game screen" is positioned at the bottom right of the banner. At the bottom left of the page, the word "Worlds" is visible with a right-pointing arrow.

Home

JOIN + NEW LOGIN HELP

NEW UI

Experience improved game play!

Try out our new enhanced game screen! Improvements include responsive text size, improved readability, full screen toggle, and capability for future visuals for Dragon users. You can switch to the old view under the settings display tab.

Try new game screen

Worlds

My main question:

"Why are we not all generating art all the time now?"

CLIP+...

"Progressive
Denoising
Autoencoder"

AKA

"Diffusion Model"

PLUG FOR TONIGHT'S TALK:



"Curves & Categories, in the style of
Wassily Kandinsky"

CLIP+...

"Progressive
Denoising
Autoencoder"

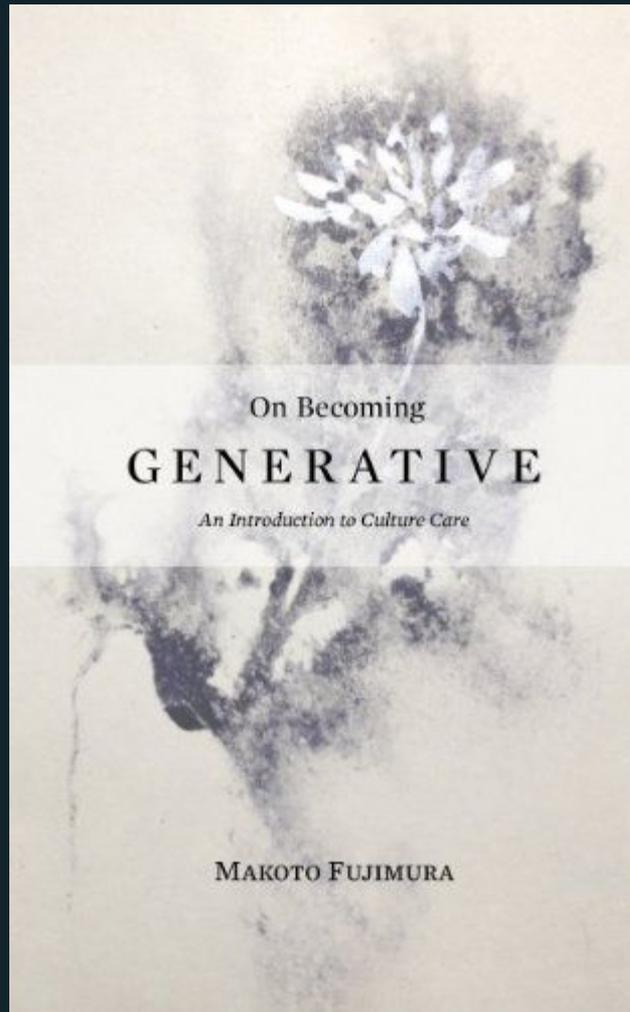
AKA

"Diffusion Model"



"Curves & Categories, in the style of
Wassily Kandinsky"

One more plug:



Discussion Questions

"Why are we not all
generating art all the
time now?"

What are the roles of...

- spontaneity & inspiration
- method & process
- purpose/intentionality & control
- communication
- emotion (joy, anguish,...)
- personal style

...in artistry?

(visual art, music, poetry, novels,...)