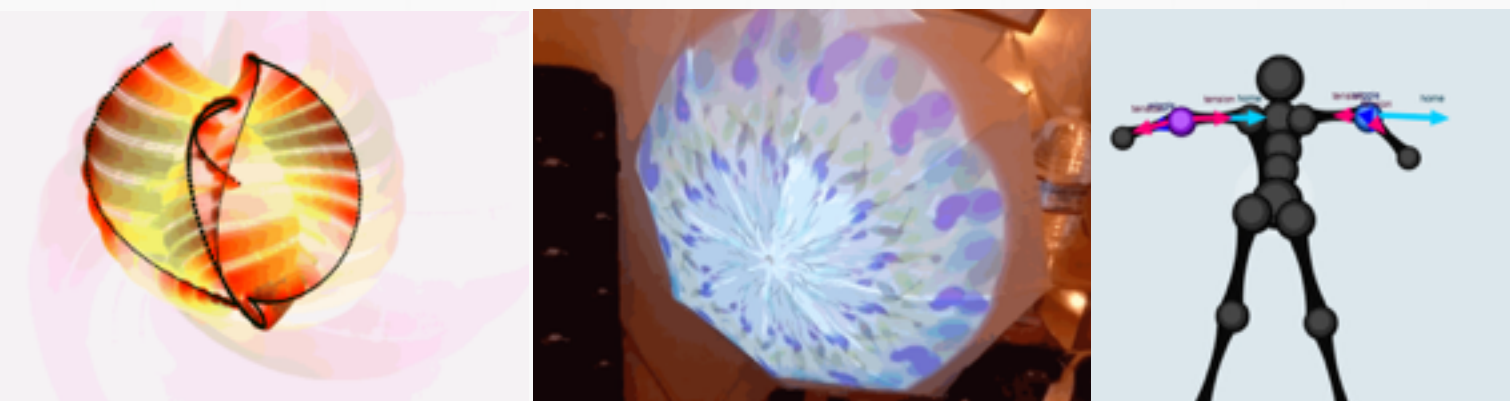
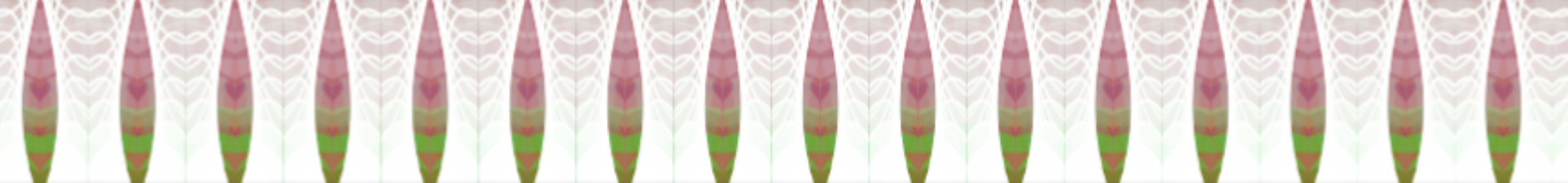




Generative Art

(and games and more)

KATE COMPTON @GALAXYKATE



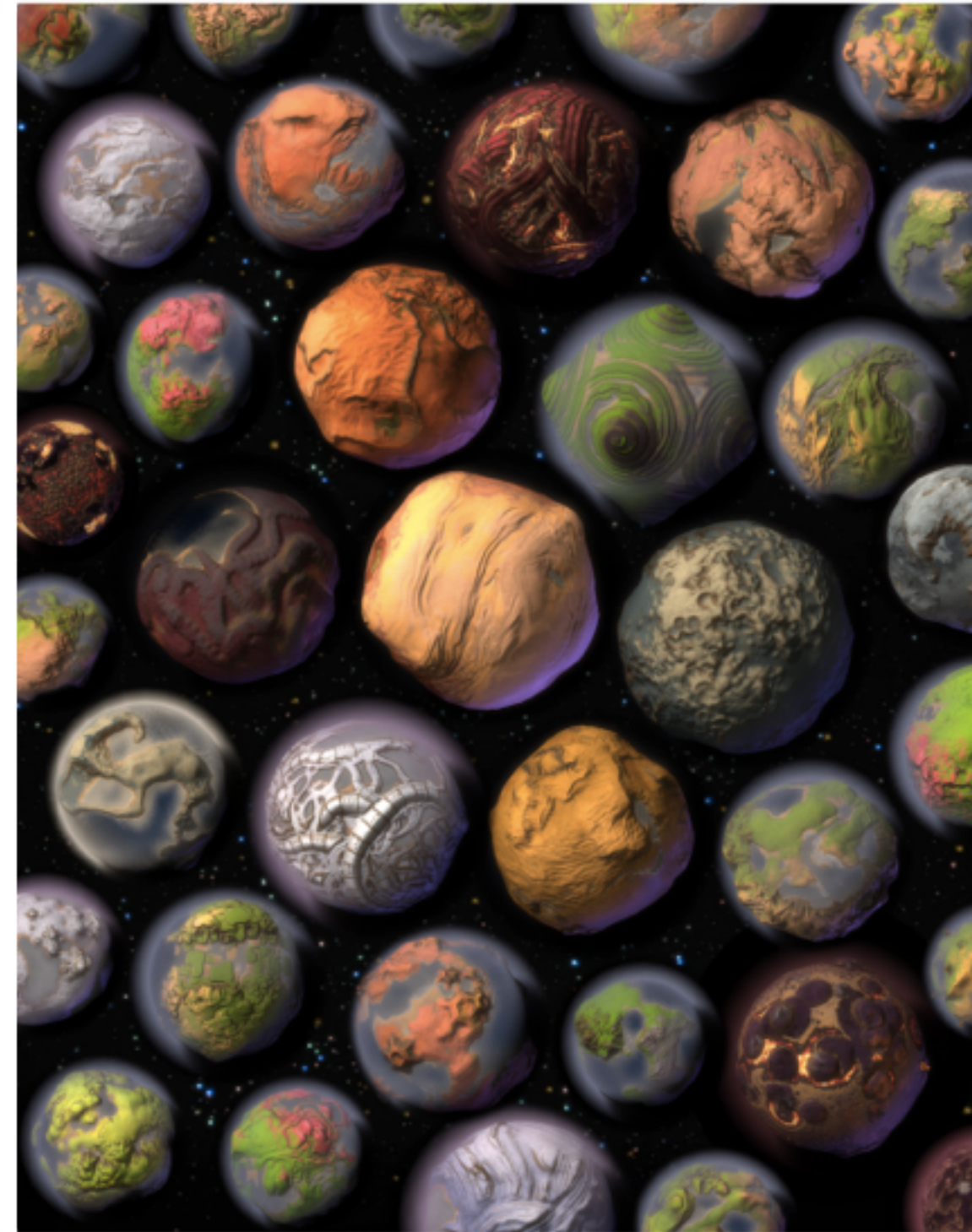
GalaxyKate

KATE COMPTON

GALAXYKATE.COM

@GALAXYKATE

- 5 YEARS ON SPORE, SIMCITY (AND SOME CANCELLED PROPERTIES)
- 5+ YEARS OF A PHD IN GENERATIVE GAMES AND CREATIVITY TOOLS FOR CASUAL USERS
- CONTRACTING FOR CHATBOTS ON THE GOOGLE HOME AND 3D PRINTING APPS
- MADE TRACERY, A LANGUAGE FOR GENERATIVE TEXT. USED FOR CHEAPBOTSDONEQUICK, HOSTING ~~3791~~ 6000 ACTIVE BOTS
- I MAKE GENERATIVE ARTBOTS, GAMES, ART TOOLS AND MORE
- I WRITE ABOUT AND TEACH OTHERS HOW TO MAKE GENERATIVE THINGS.



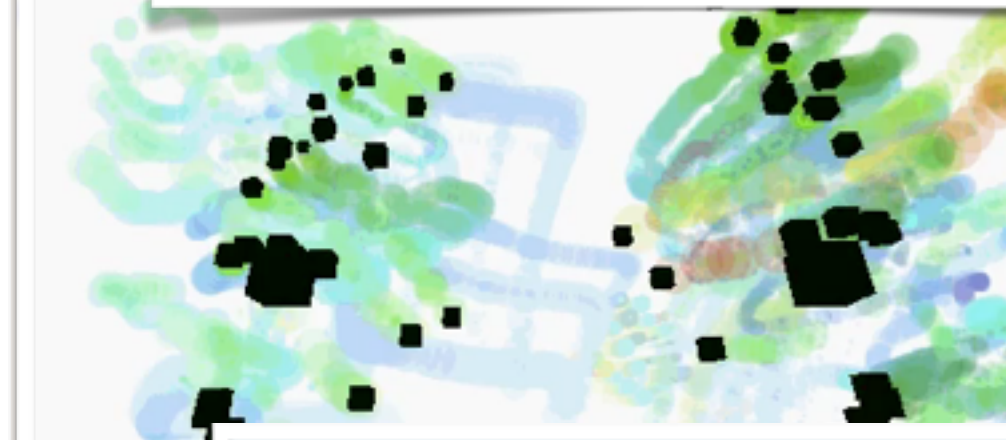
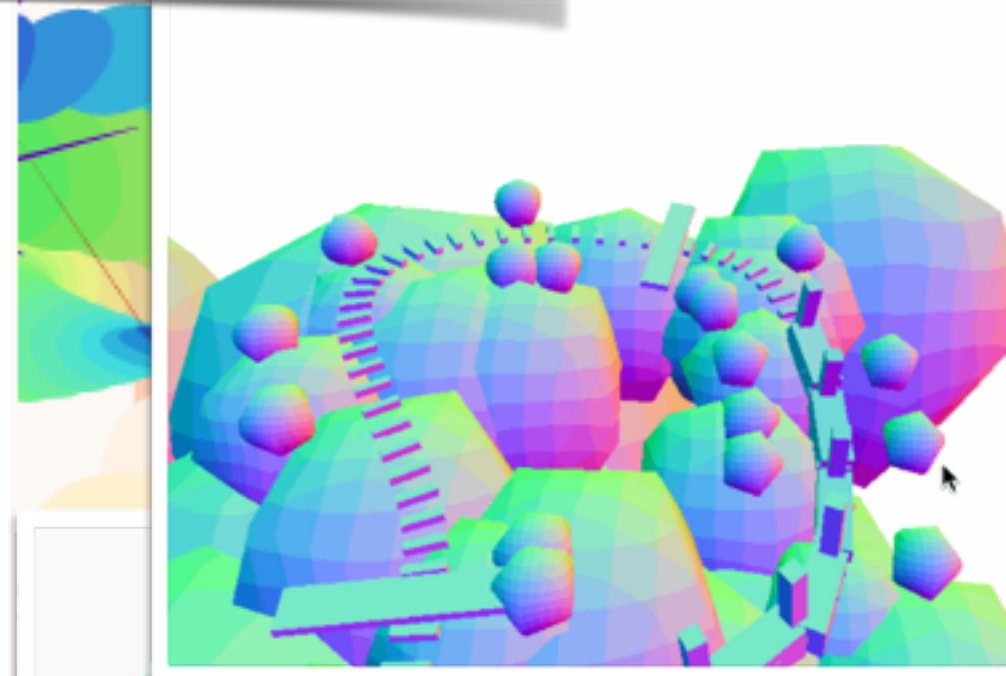
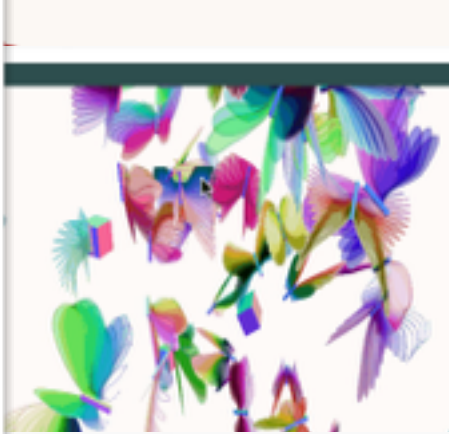
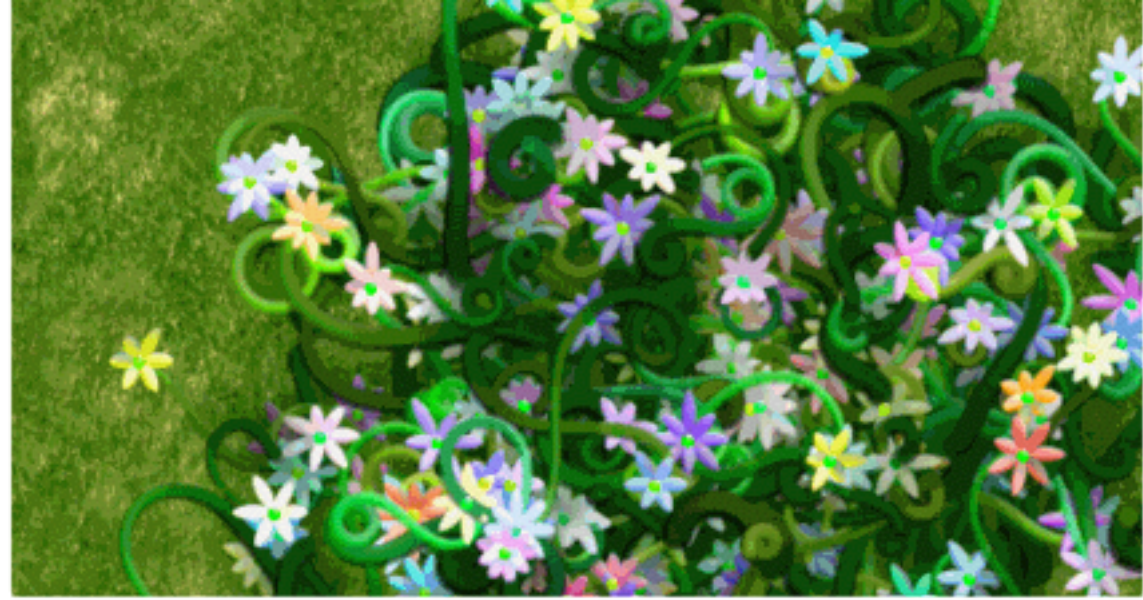
GalaxyKate

KATE COMPTON

GALAXYKATE.COM

@GALAXYKATE

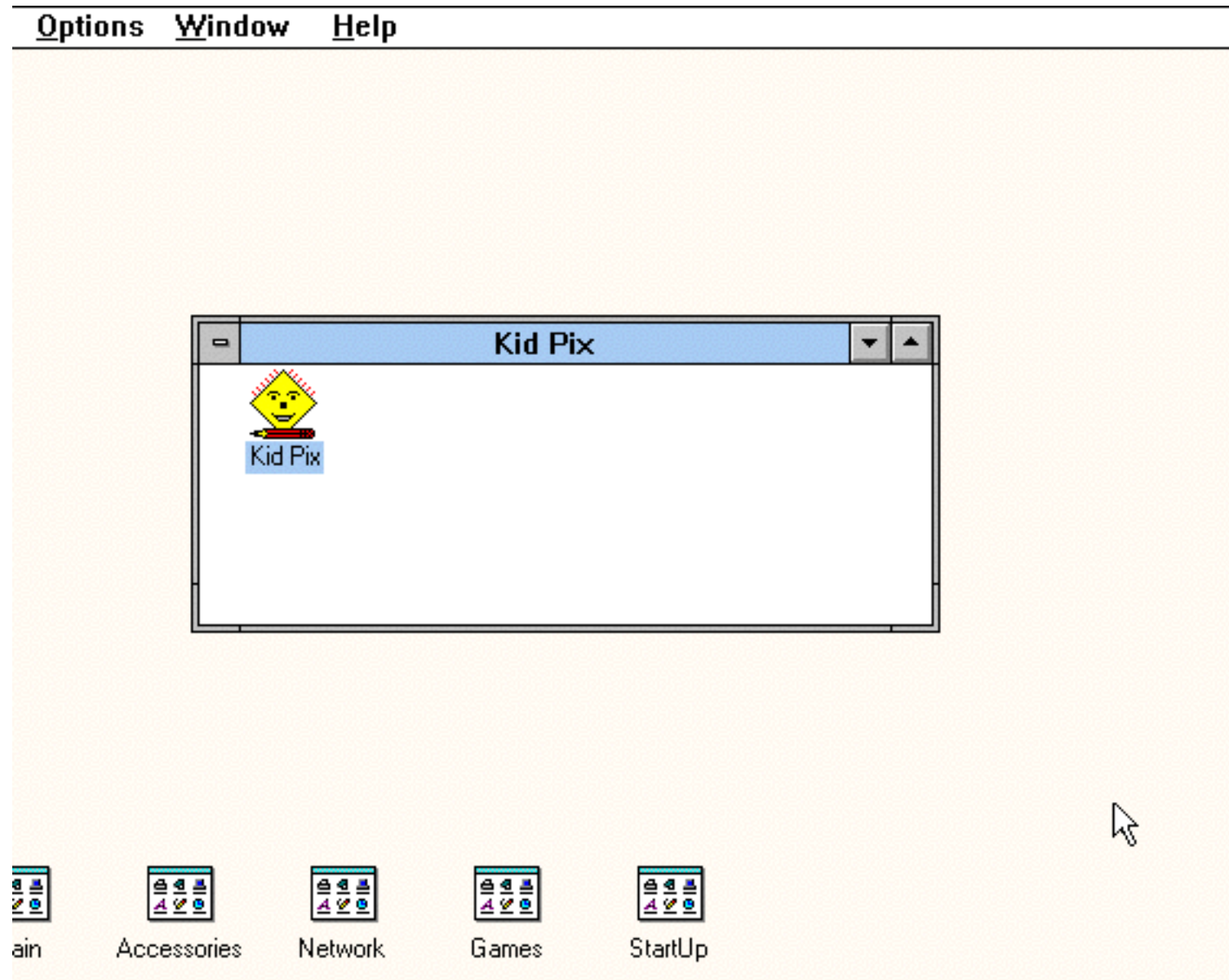
- 5 YEARS ON SPORE, SIMCITY (AND SOME CANCELLED PROPERTIES)
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Generative art can be interactive!

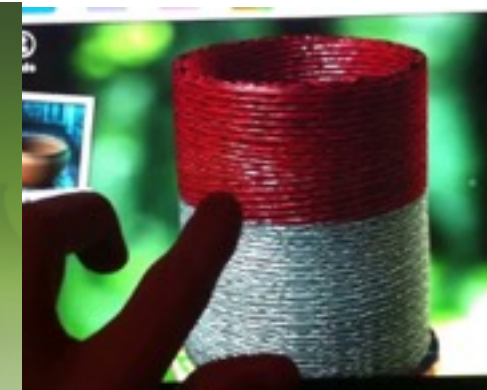


Generative art can be interactive!



What can you generate?

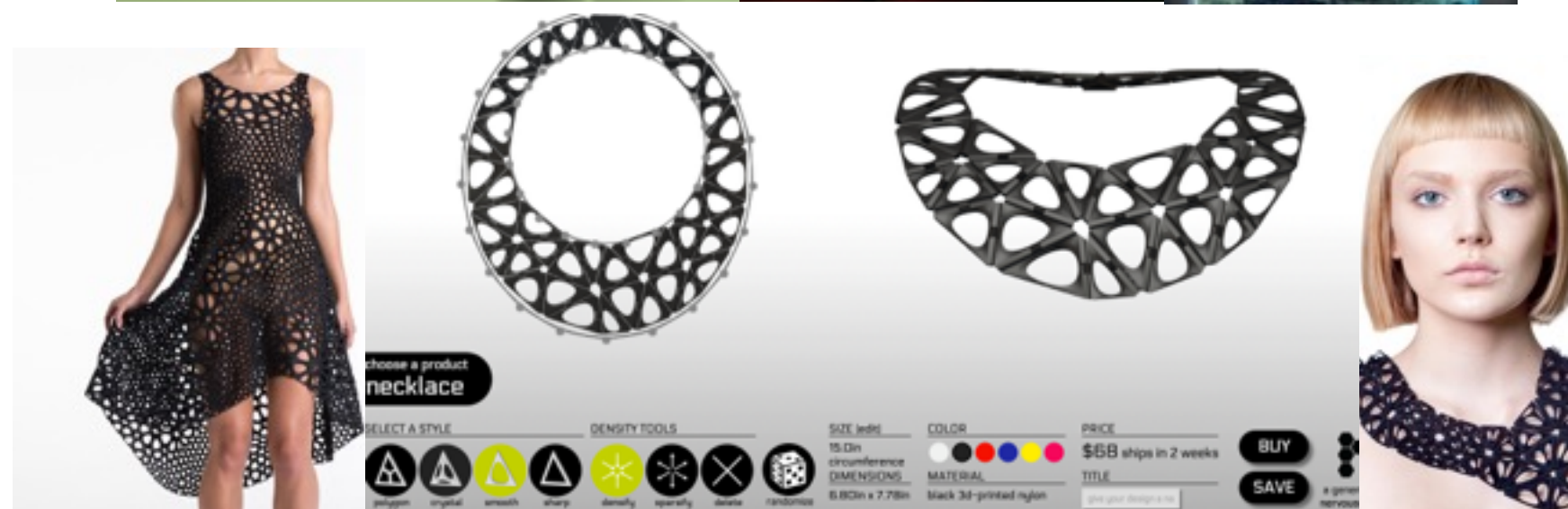
- Music



- ARCHITECTURE

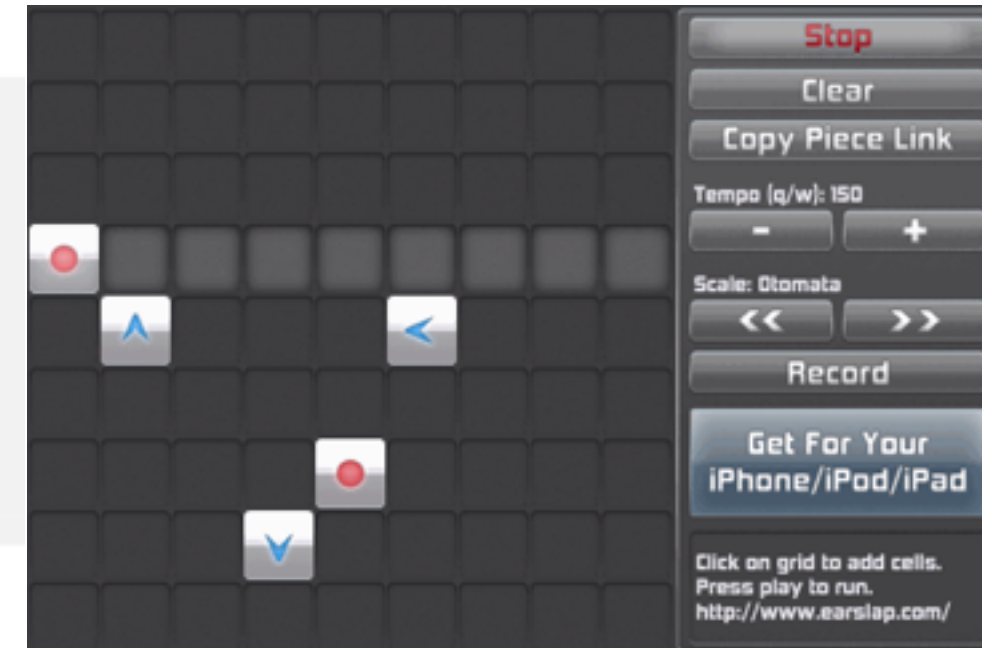
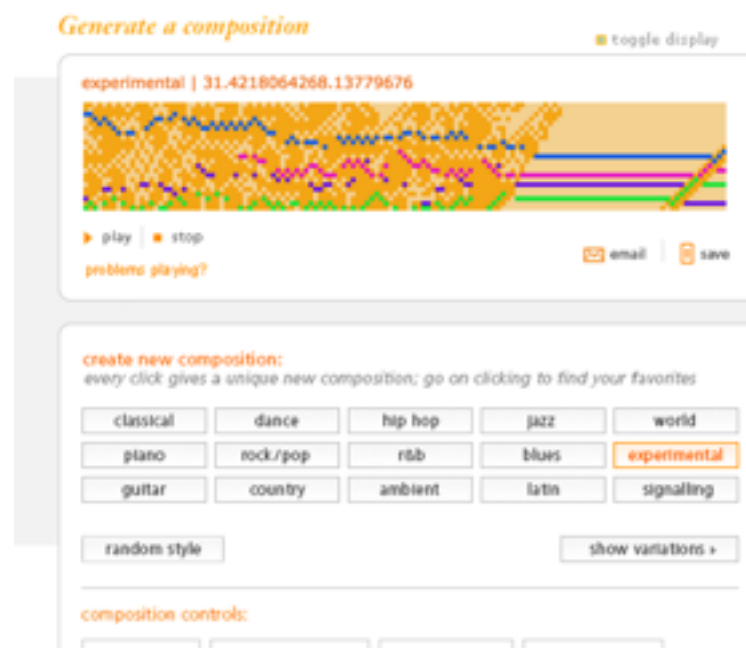
- ART

- FASHION



- INDUSTRIAL DESIGN

- ???

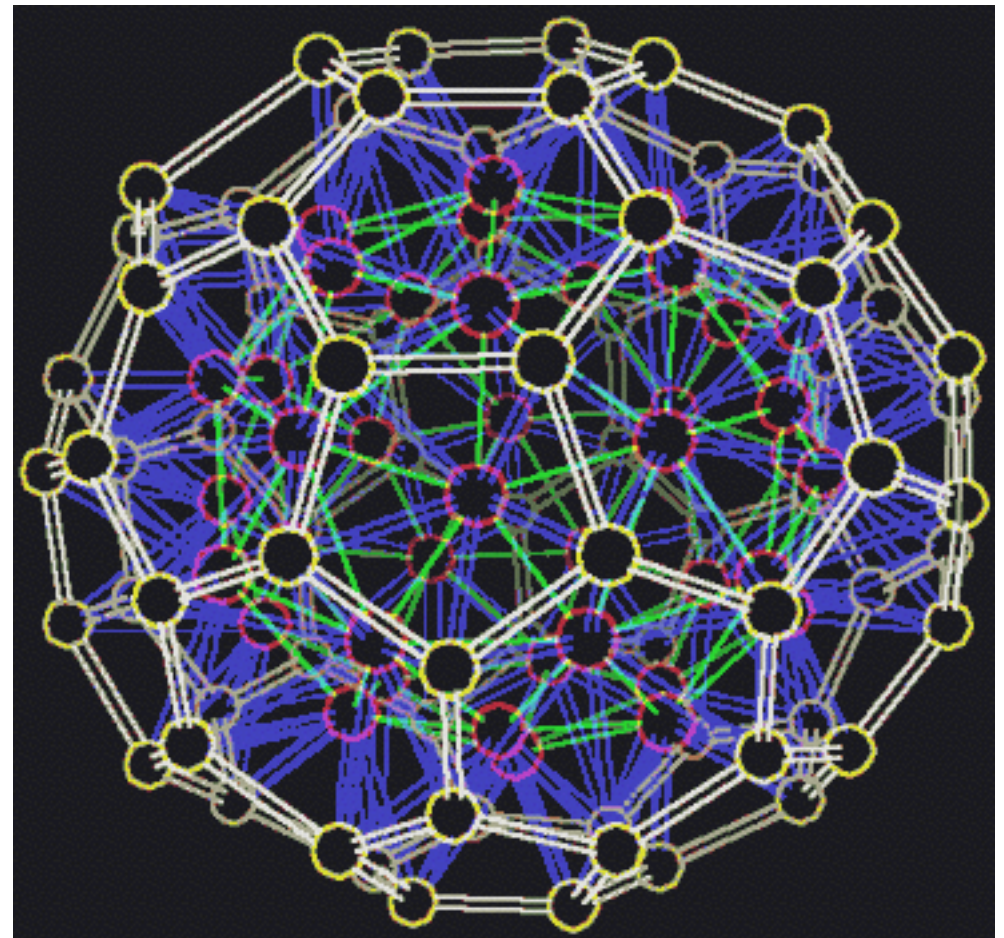


What can you generate?

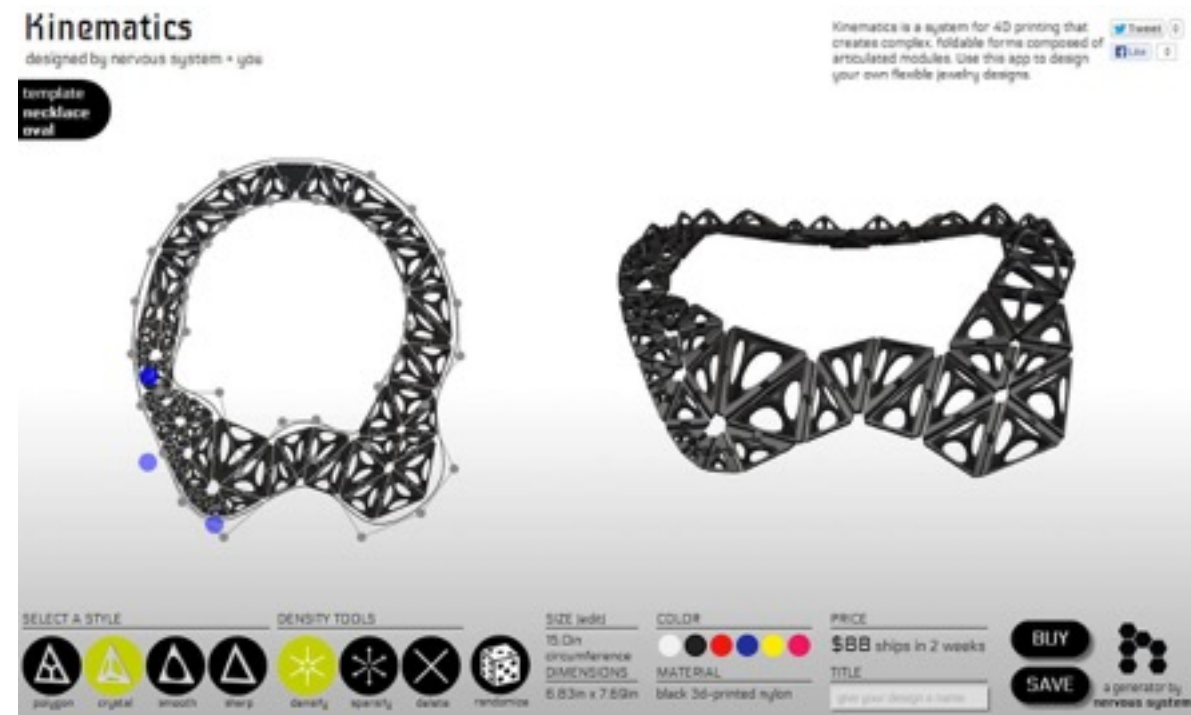
TENSEGRITY ARCHITECTURE



self-equilibrated configurations of truncated regular polyhedral tensegrities					
type	tetrahedral	cubic	octahedral	dodecahedral	icosahedral
(a) super-stable					
(b) not super-stable					

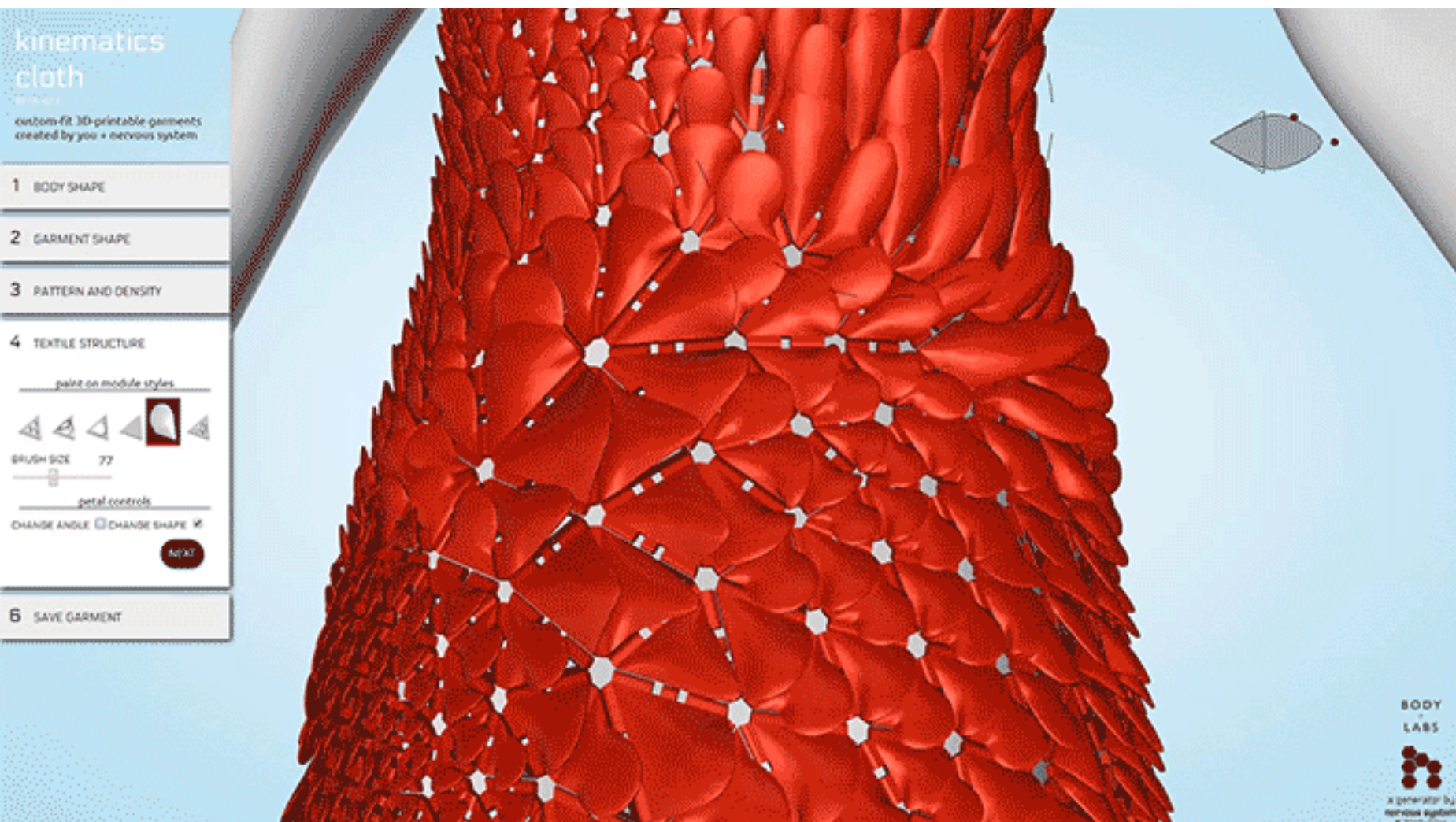


What can you generate?



POINT-BASED PARAMETRIC DELAUNAY DIAGRAMS

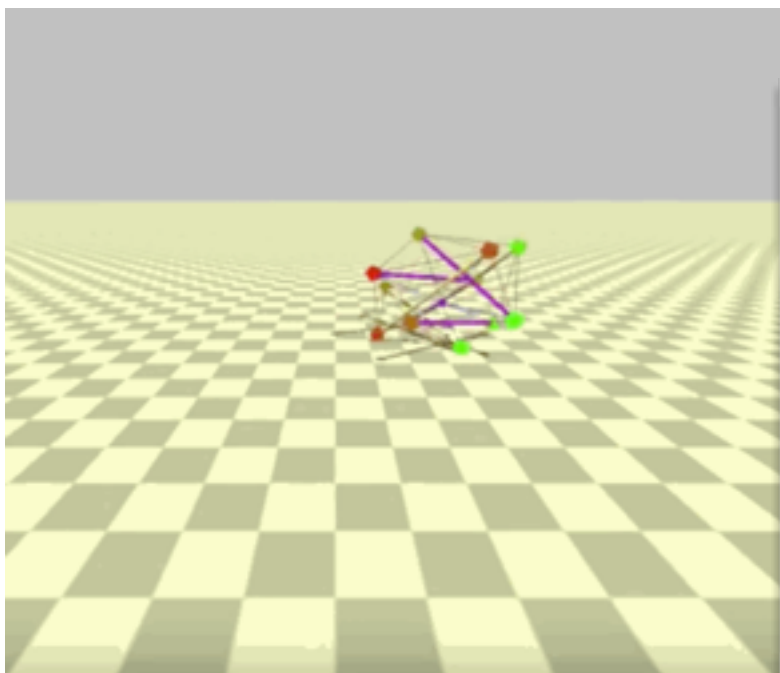
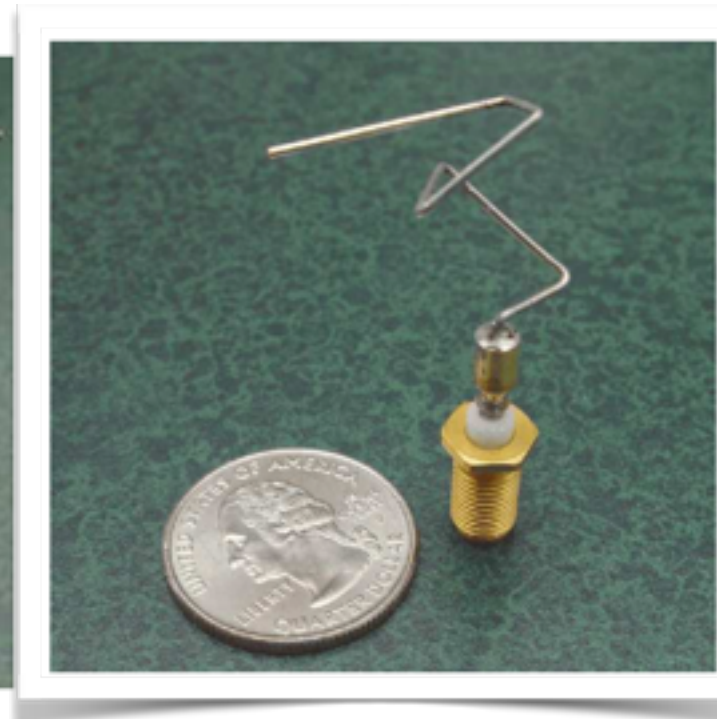
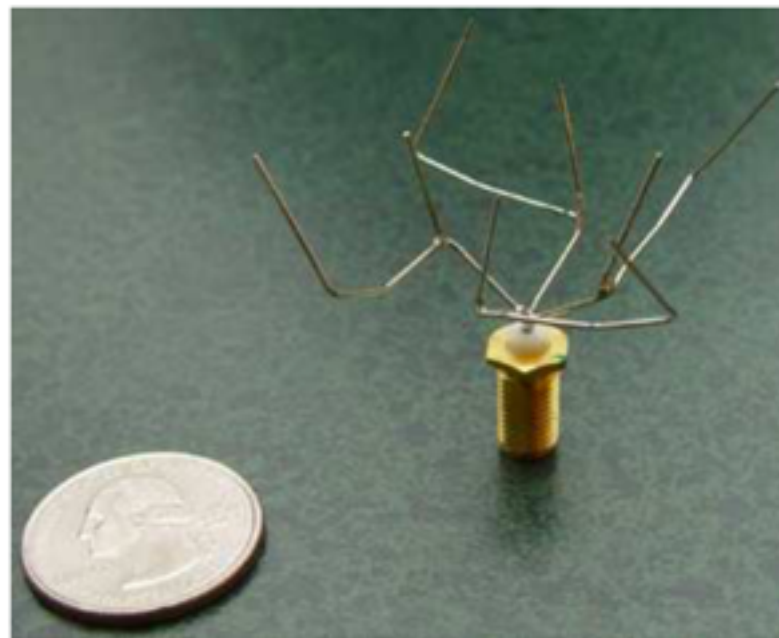
NERVOUS SYSTEM



What can you generate?

GENETIC ALGORITHMS

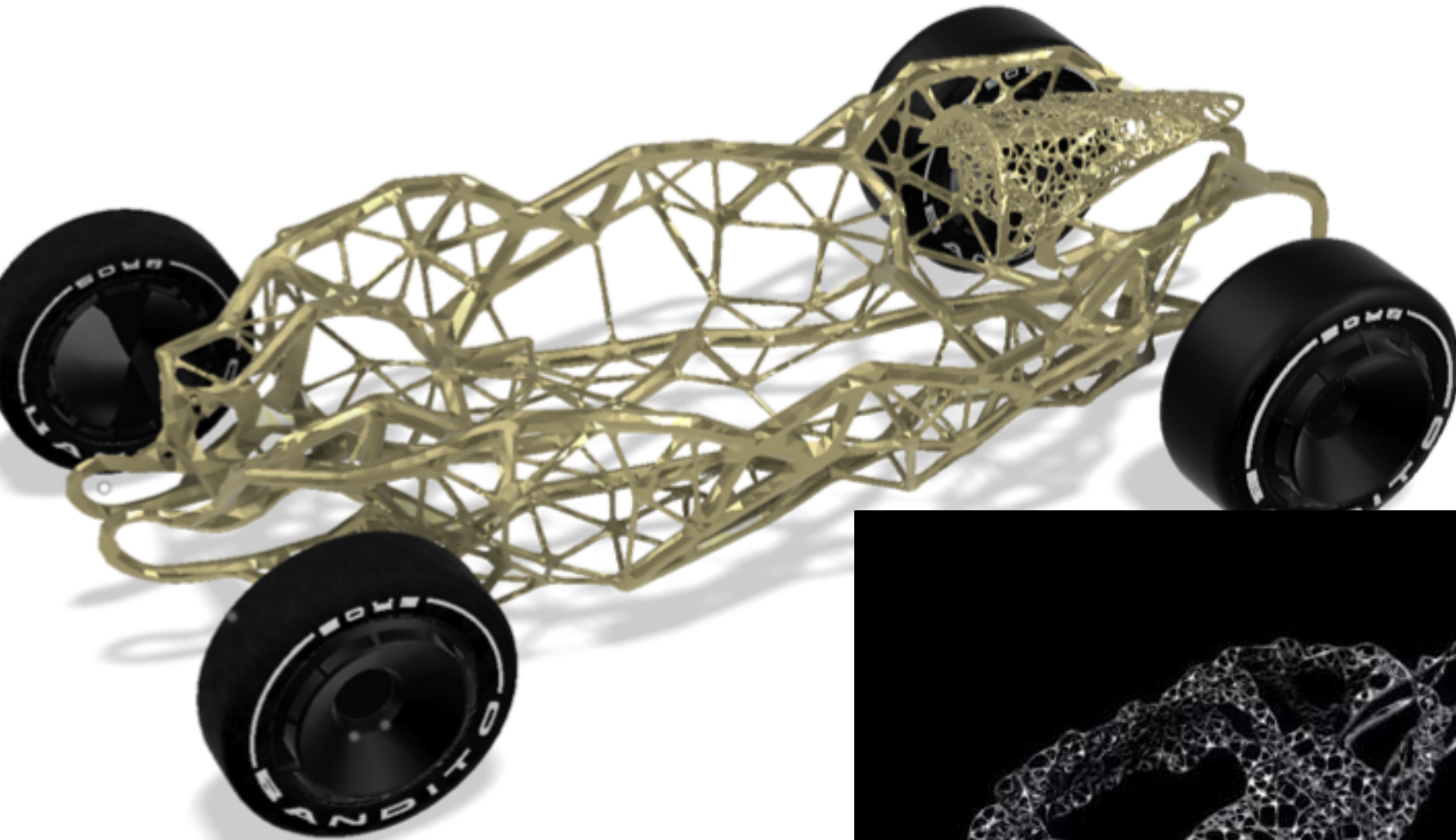
2006 NASA ST5
SPACECRAFT ANTENNA



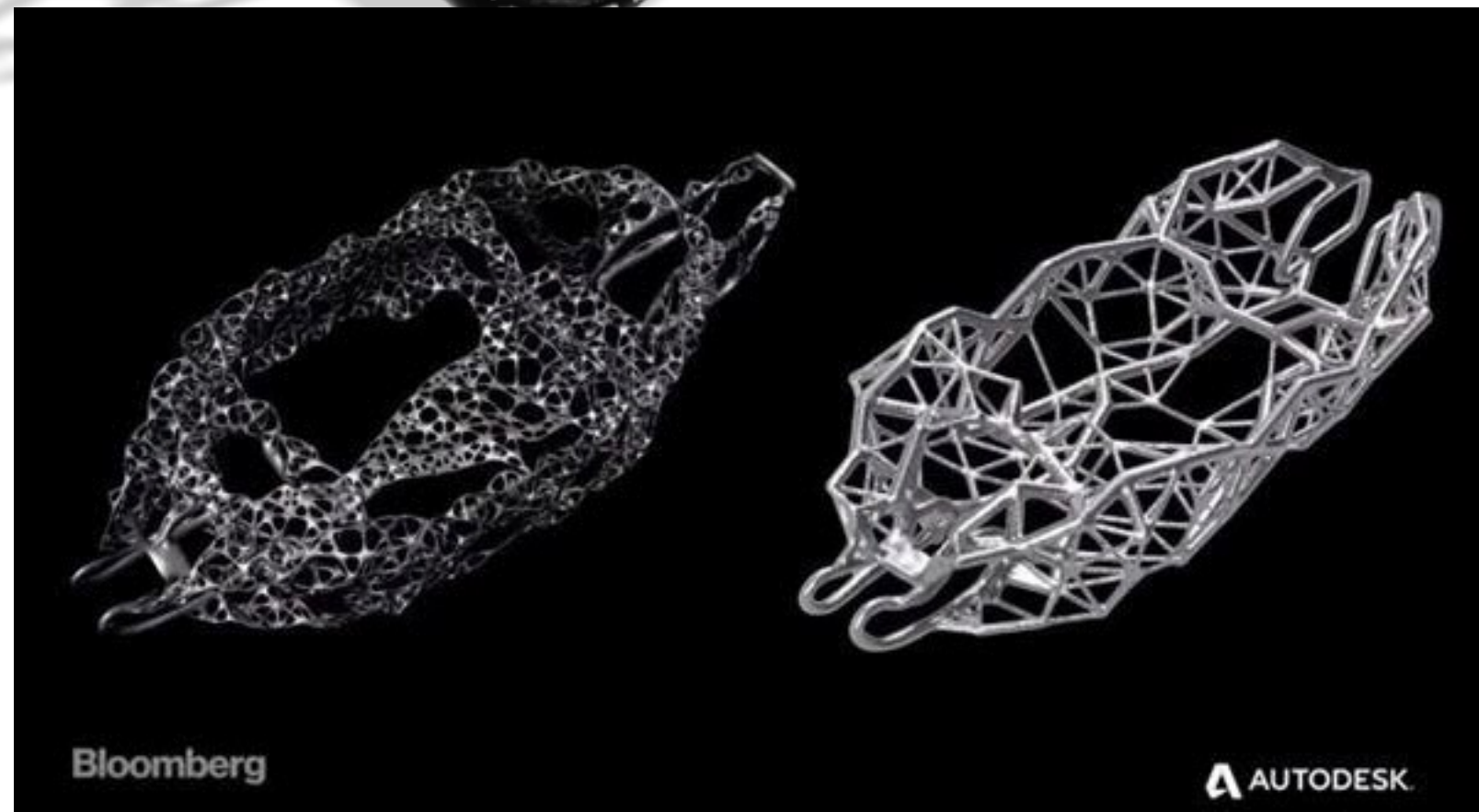
2015 NASA SUPER BALL BOT

What can you generate?

GENETIC ALGORITHMS



HACKROD

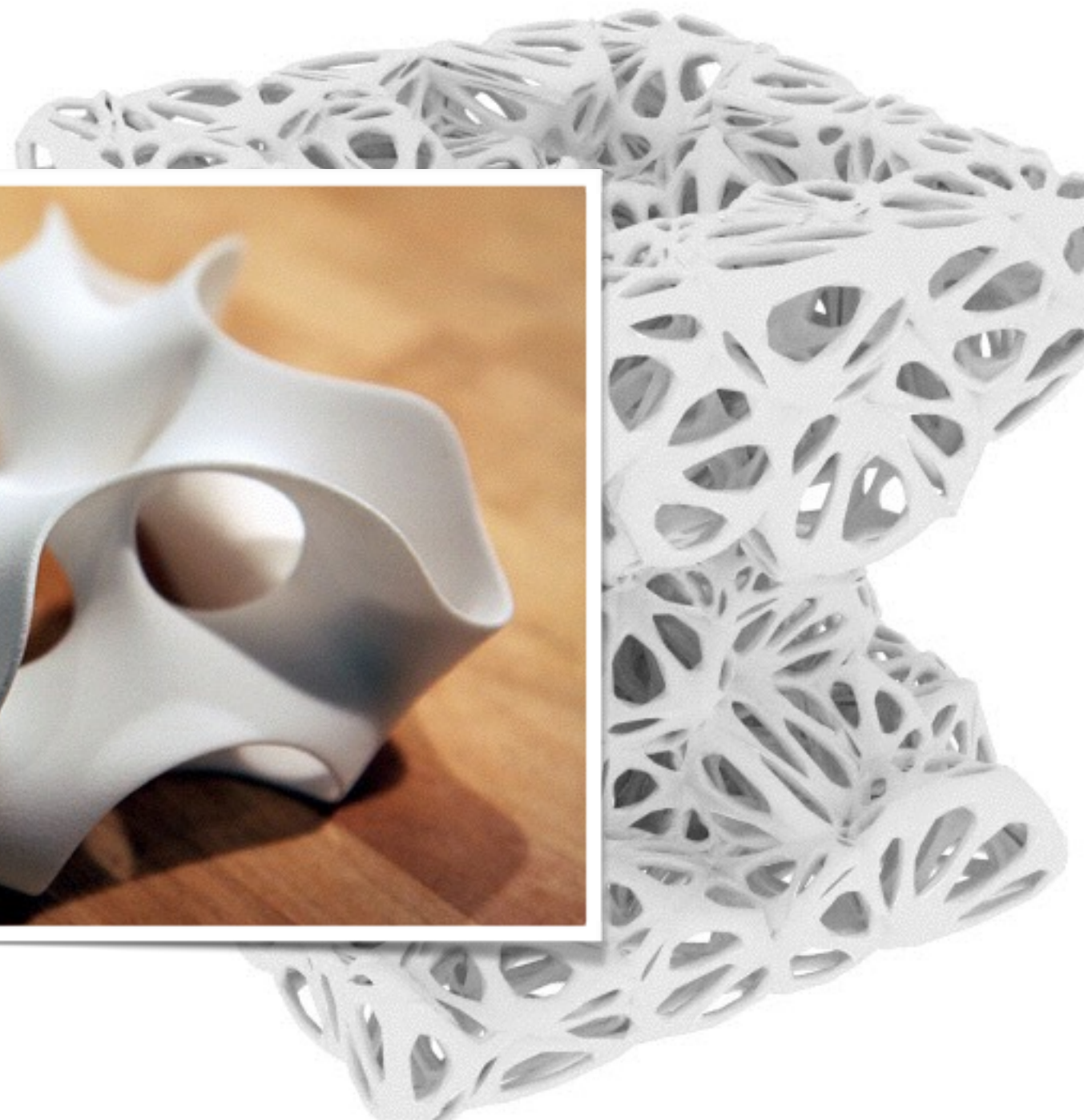
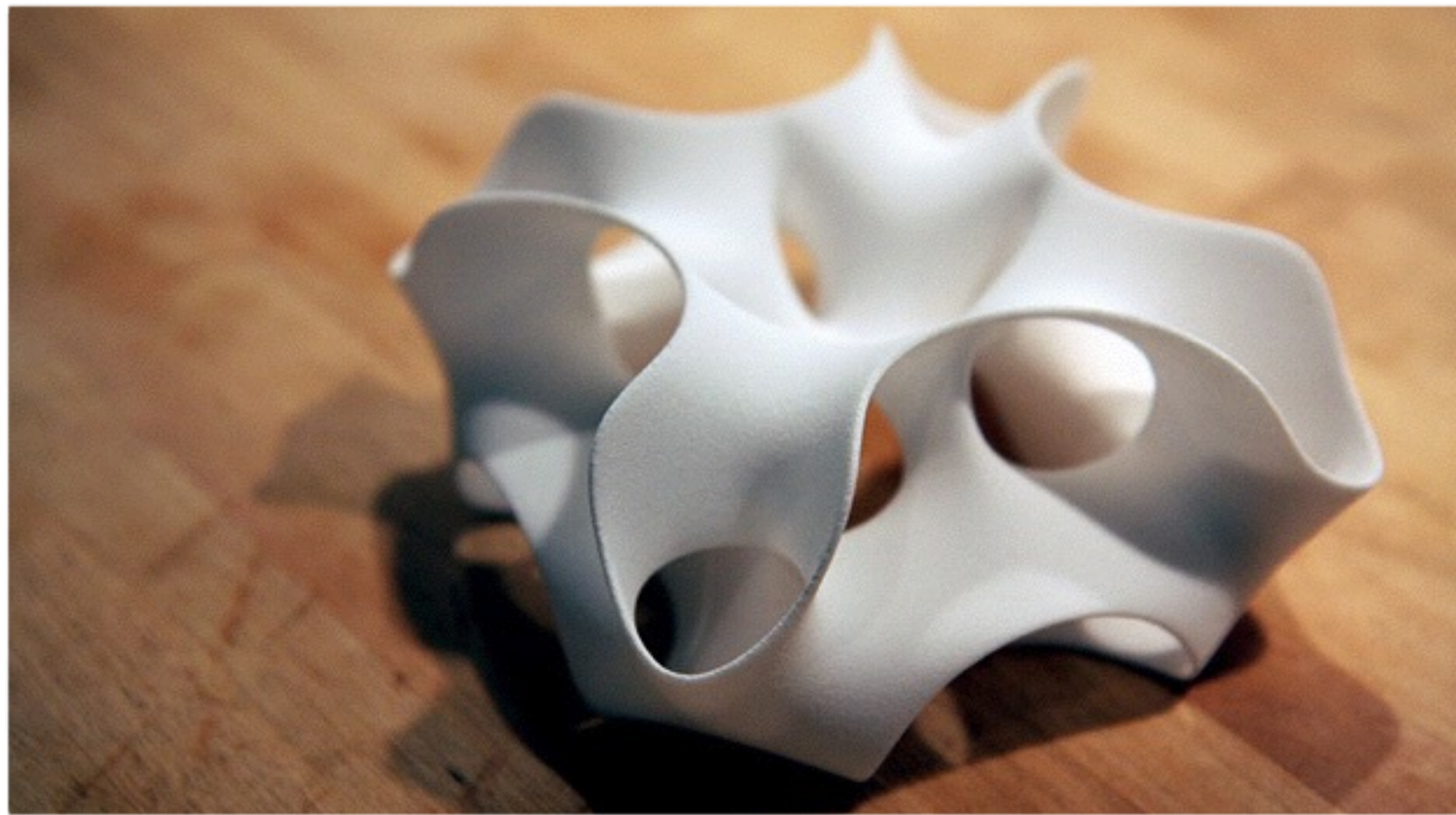
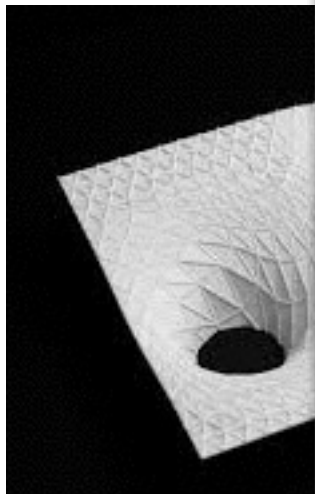
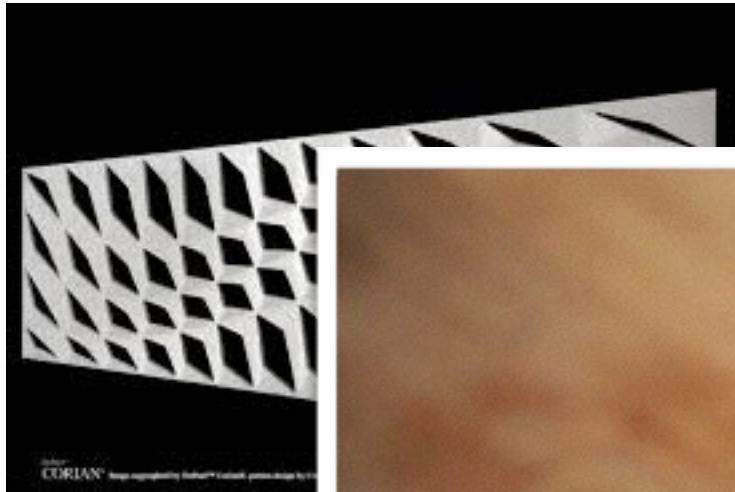


Bloomberg

AUTODESK

What can you generate?

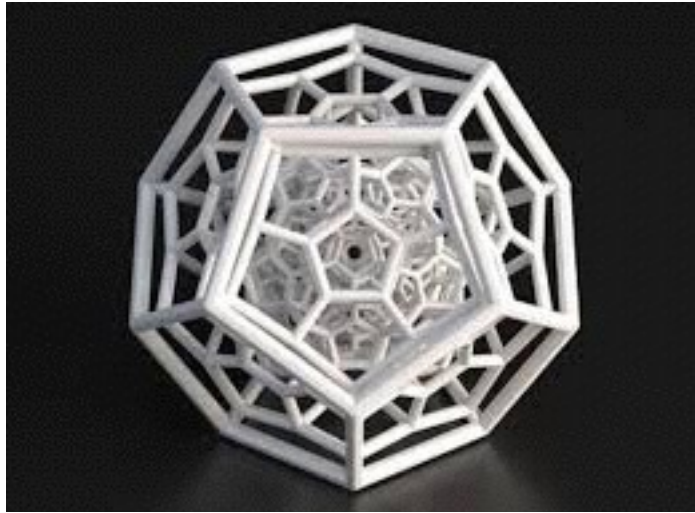
PARAMETRIC OBJECTS: GRASSHOPPER3D



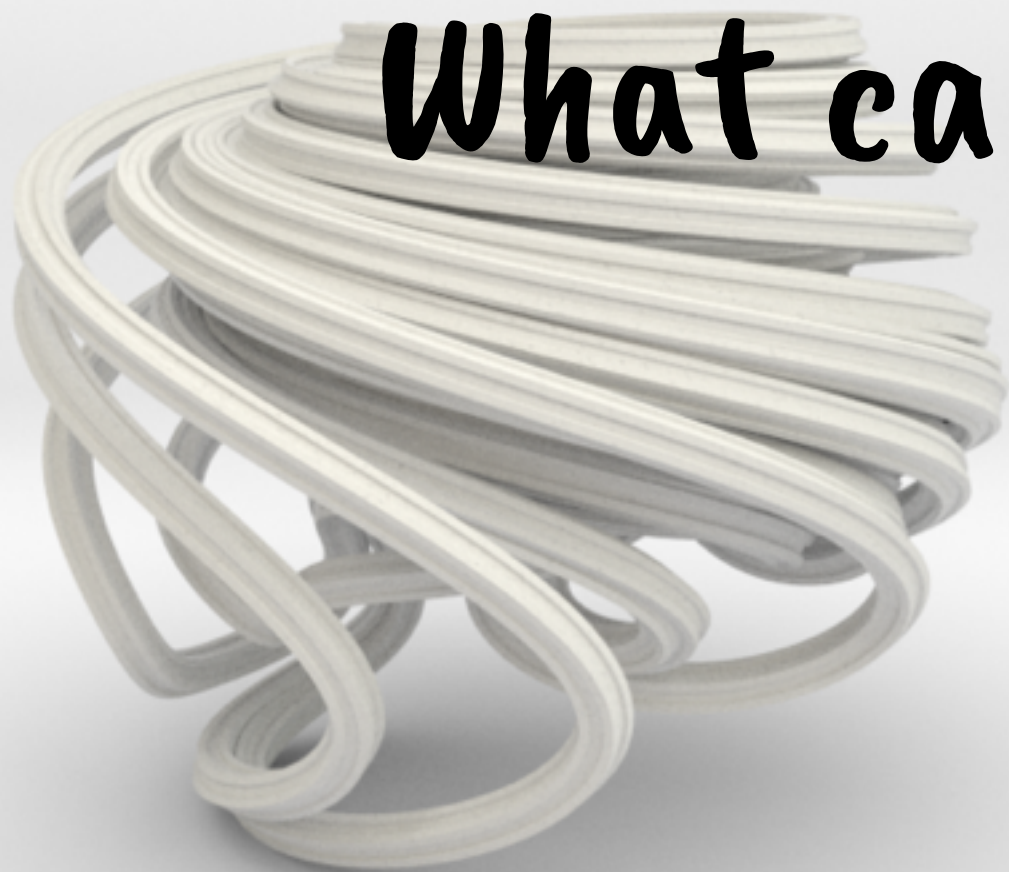
What can you generate?

SURFACE TENSION MODELS

BATHSHEBA GROSSMAN

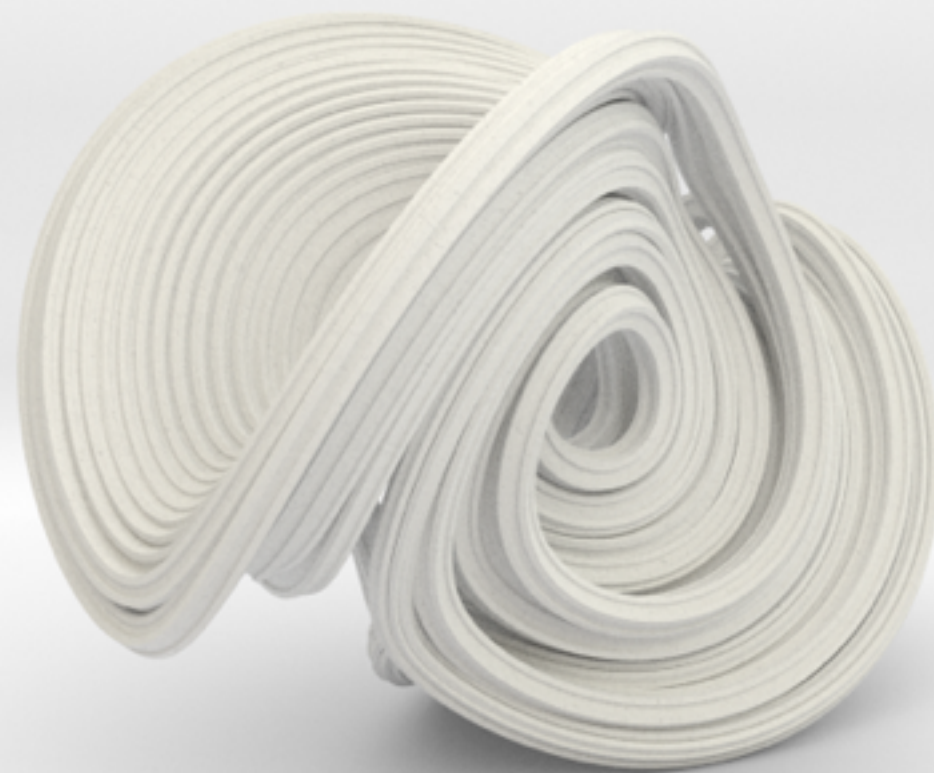
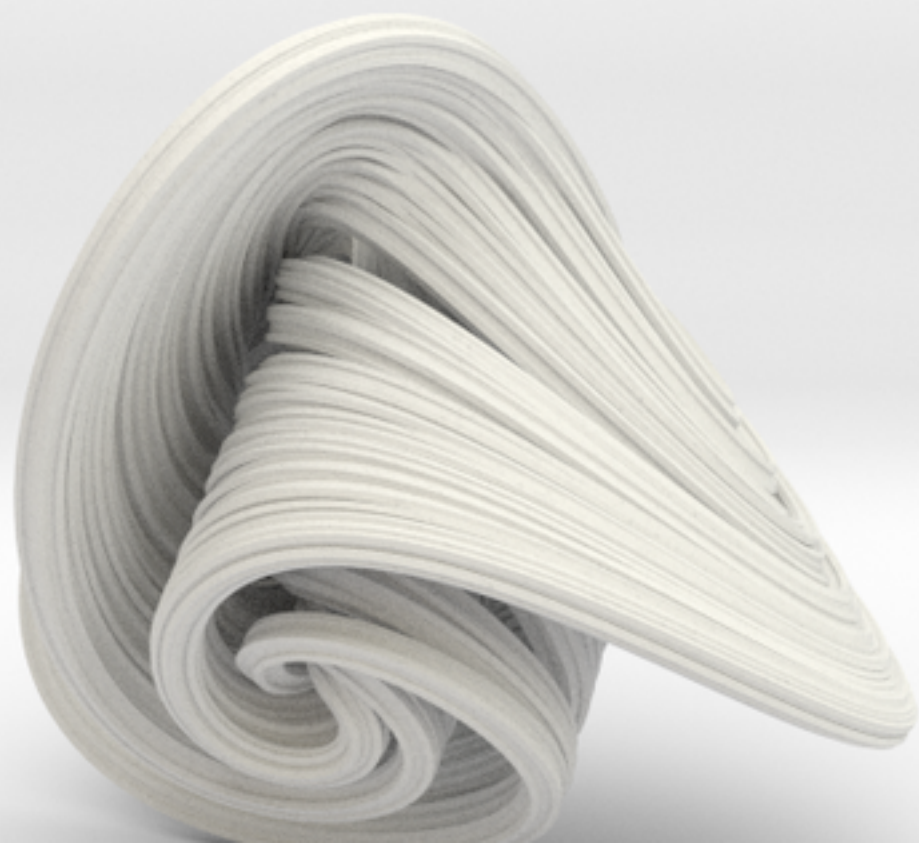


What can you generate?



STRANGE ATTRACTORS

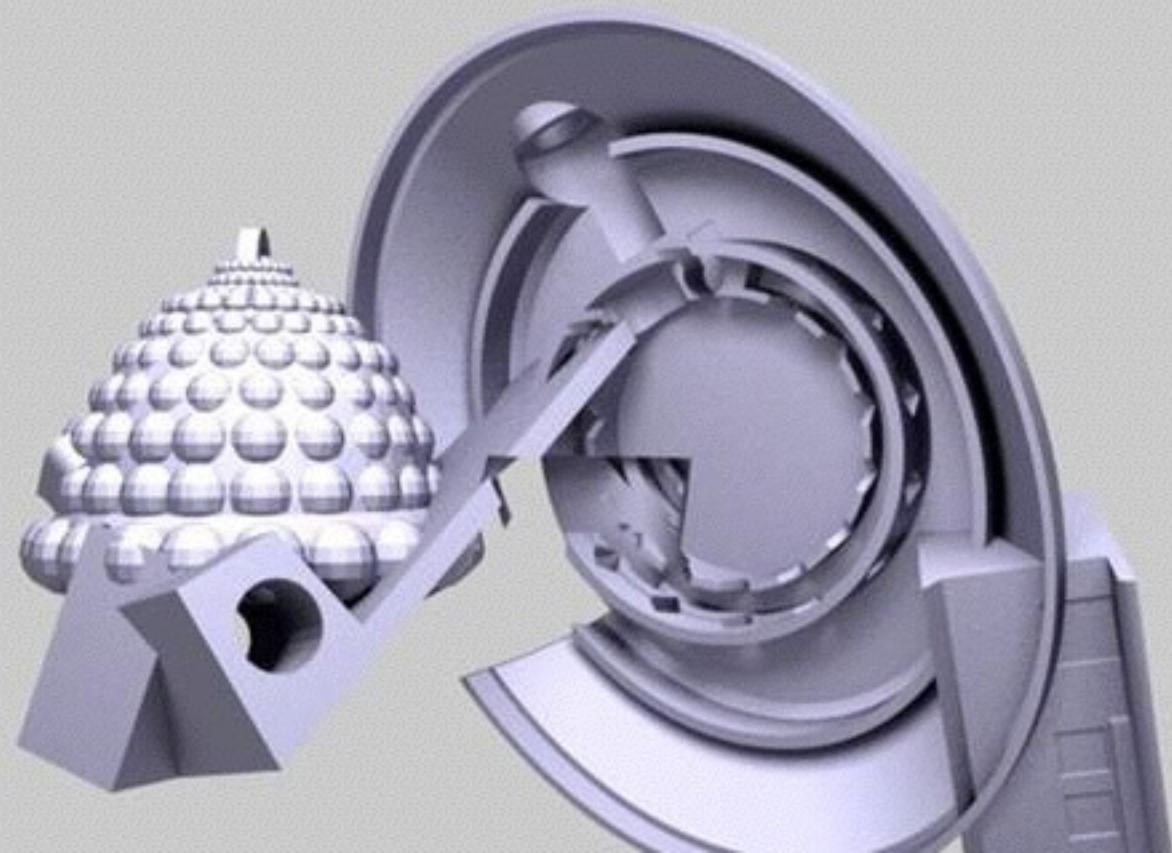
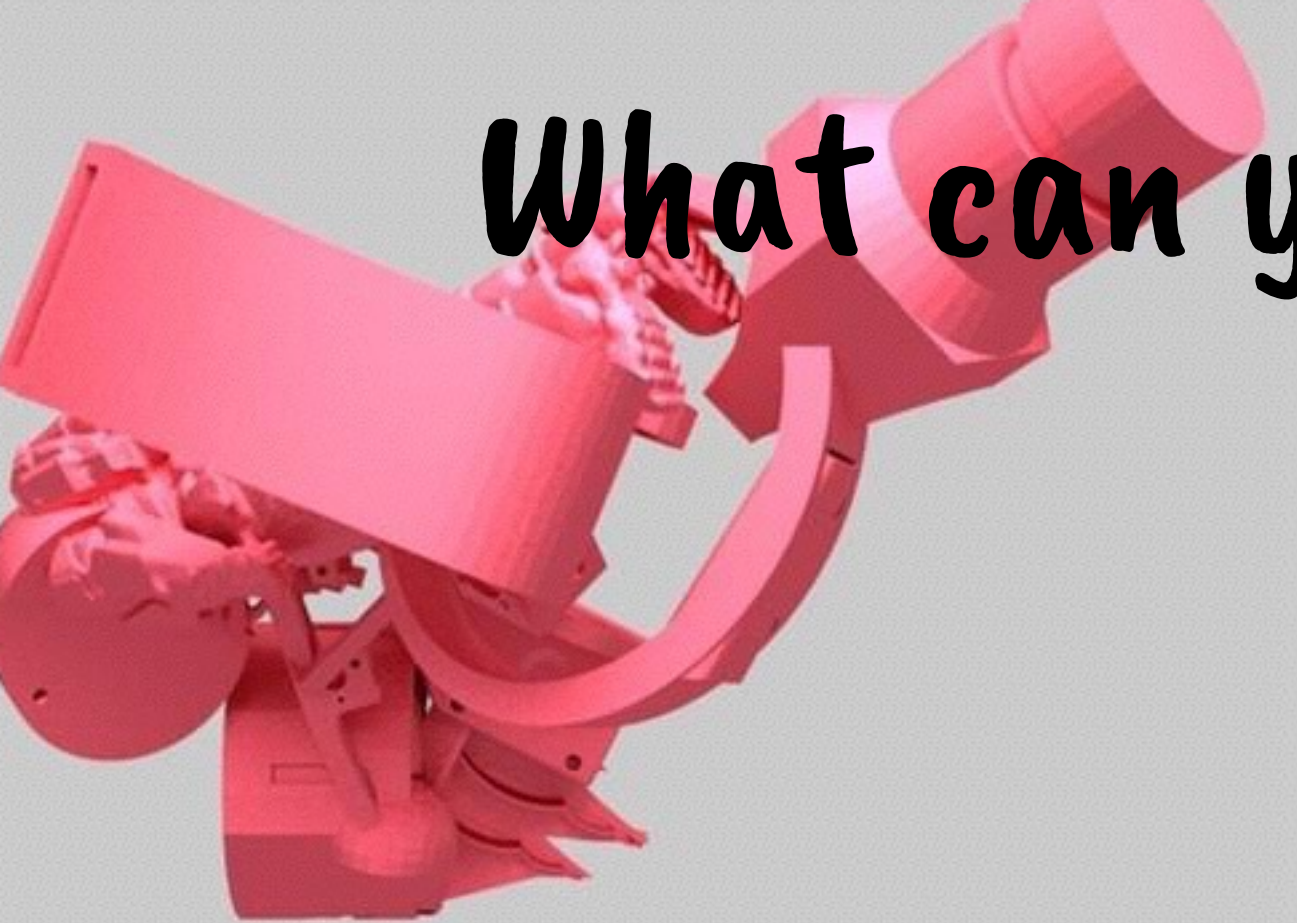
"SOLIDLY MATHEMATICAL" BY TAYLOR GIBSON @ SHAPEWAYS



What can you generate?

GRAMMAR-BASED CROWD-SOURCED MODELS

SHIV INTEGER



What can you generate?

PARAMETRIC PARTICLE-BASED PATTERN GENERATION



ALL OVER PRINT SHIRTS BY BOT COUTURE



ALOHA ARRAY

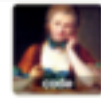


HEARTBEAT OF THE PAL...



What can you generate?

PARAMETRIC PARTICLE-BASED PATTERN GENERATION



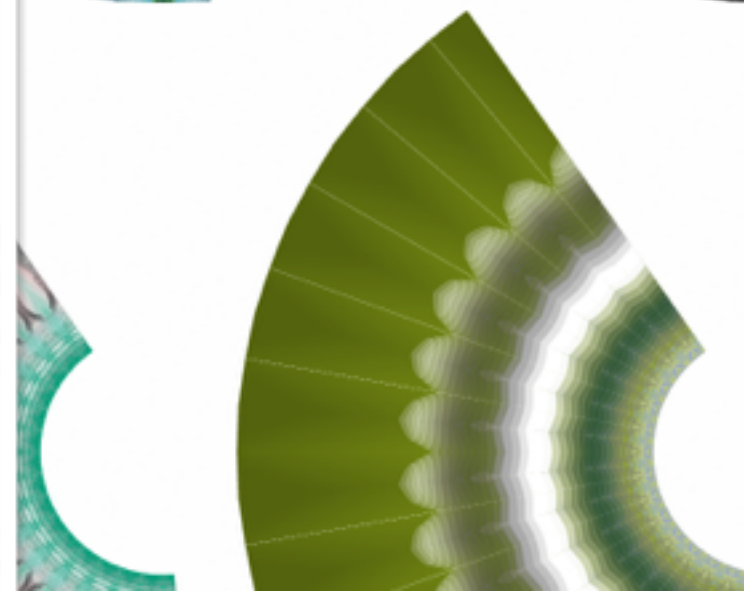
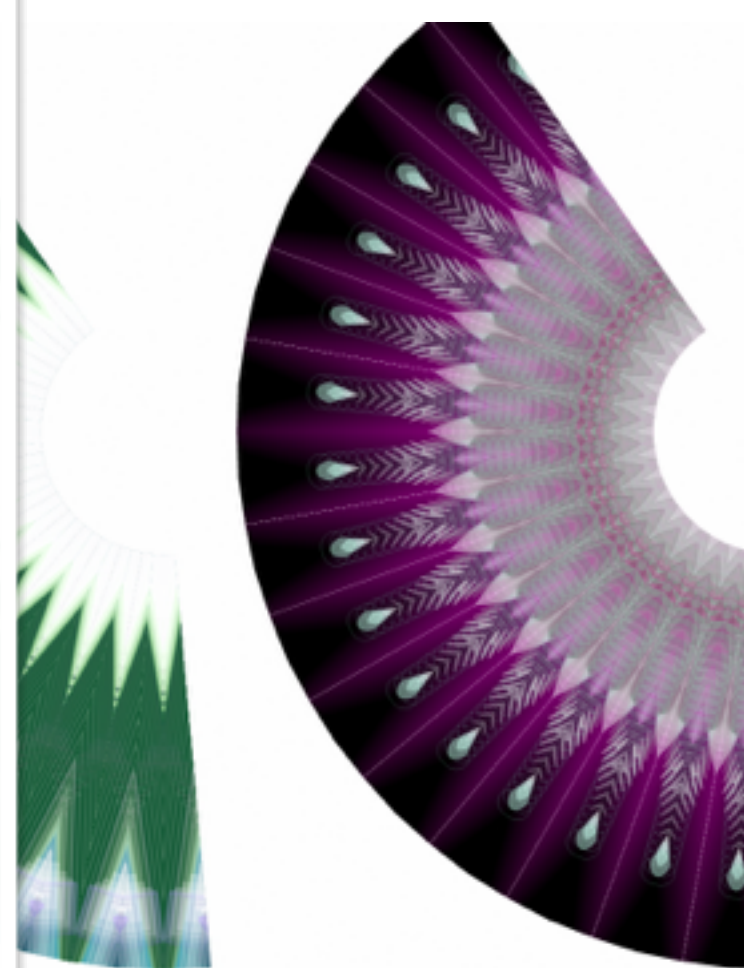
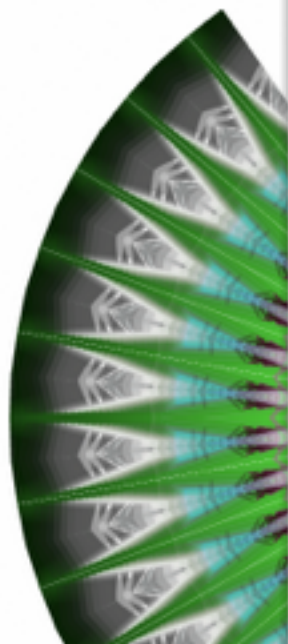
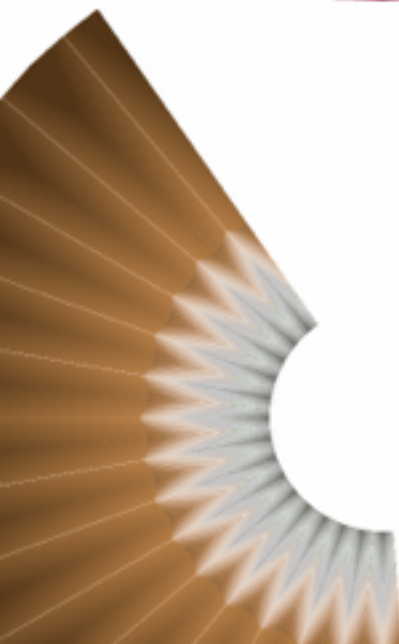
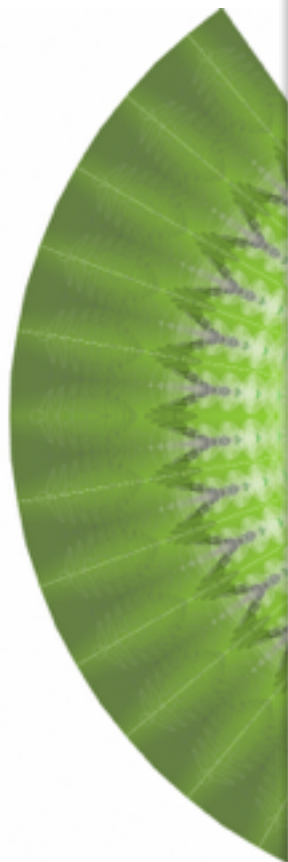
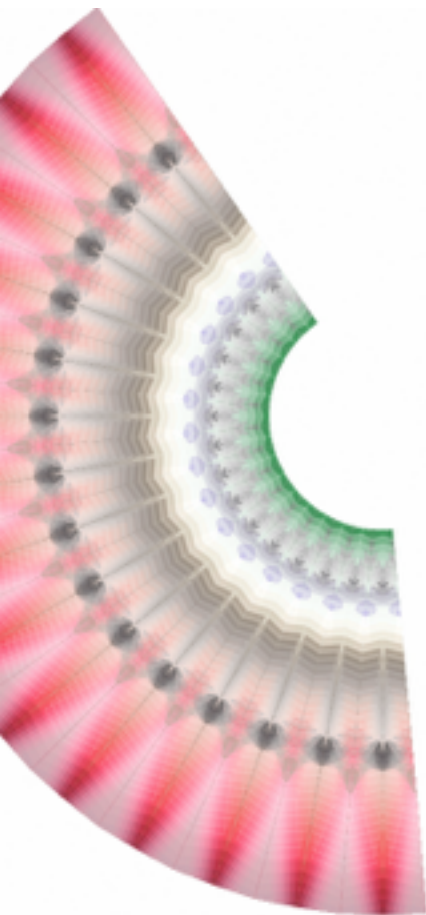
Kate Indiecade
@GalaxyKate

Bot-designed human-sewn skirt for @nuclai.

As the human, I am definitely the weakest link.
Sewing is hard 🤪



RETWEETS LIKES



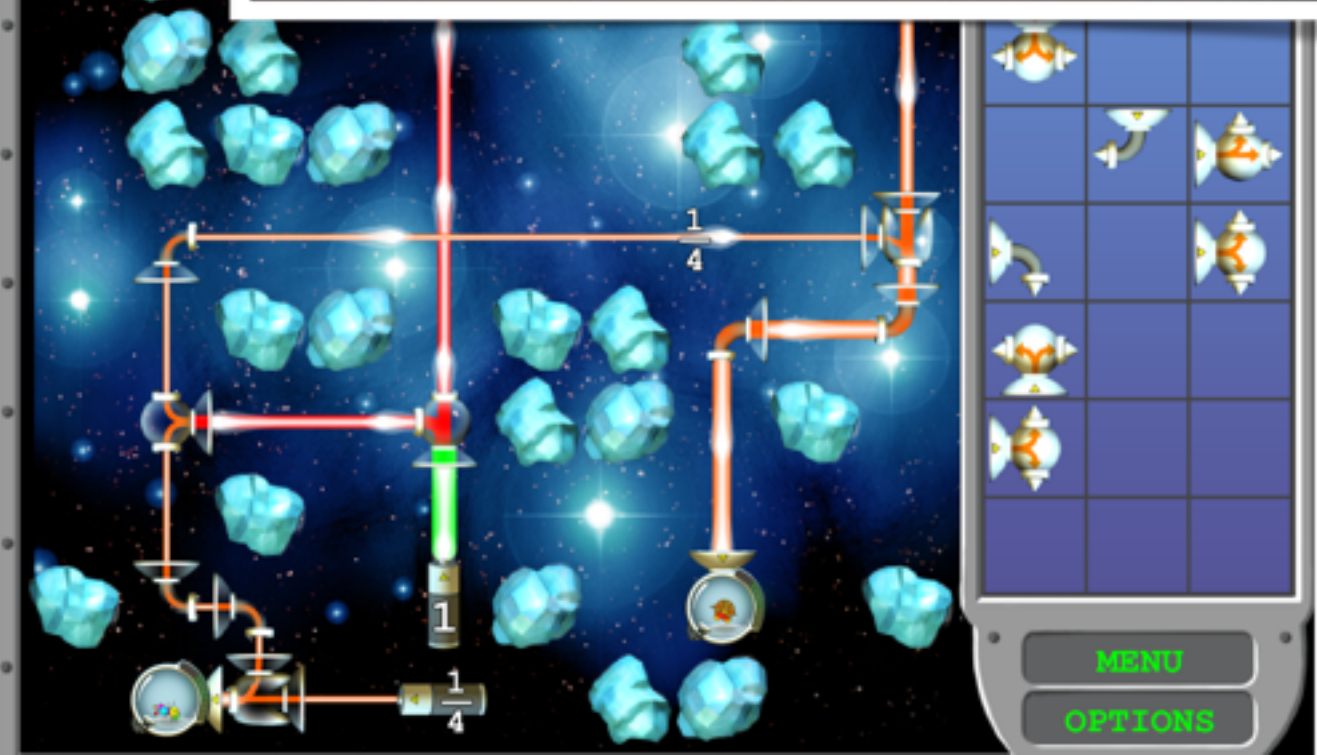
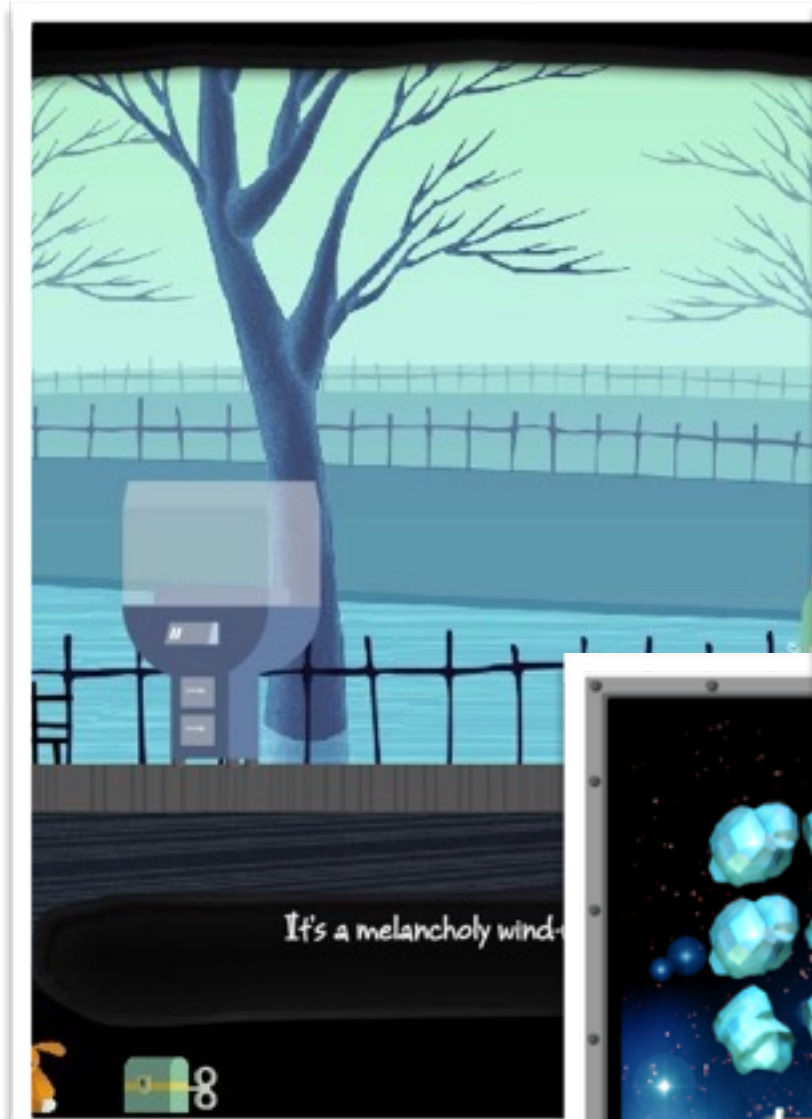
What can you generate?

- ANIMATIONS
- TEXTURES
- LEVELS
- RULES
- STORIES



What can you generate?

- ANIMATIONS
- TEXTURES
- LEVELS
- RULES
- STORIES



What can you generate?

"WE SAVED SO MUCH TIME AND MONEY BY MAKING
A GENERATOR INSTEAD OF HIRING ARTISTS"

SAID NO ONE EVER



What can you generate?

"WE SAVED SO MUCH TIME AND MONEY BY MAKING
A GENERATOR INSTEAD OF HIRING ARTISTS"

SAID NO ONE EVER

INSTEAD:

- ART THAT IS MADE FROM USER INPUT
- ART THAT THE COMPUTER AND USER MAKE TOGETHER
- ART THAT YOU CAN GENERATE FOREVER (OVER AND OVER AND OVER AND OVER)
- AN ARTSPACE THAT YOU CAN EXPLORE MATHEMATICALLY

Ways to interact with a generator

The Sorting Hat Bot @SortingBot · 13 Jun 2015
@LtPinkerton You stand before the Sorting Hat, my firearm is past
For Slytherin you cast your lot, since you are rather last

The Sorting Hat Bot @SortingBot · 11 Jun 2015
@astrophobiatic Your thoroughfare is like a scent, your ray is like a bluff
This fateful day's the day you join the house of Hufflepuff!

The Sorting Hat Bot @SortingBot · 2 Jun 2015
@Tpaul264 The Sorting time is here at last, my academe is thine
In Hufflepuff you do belong, since you are rather fine

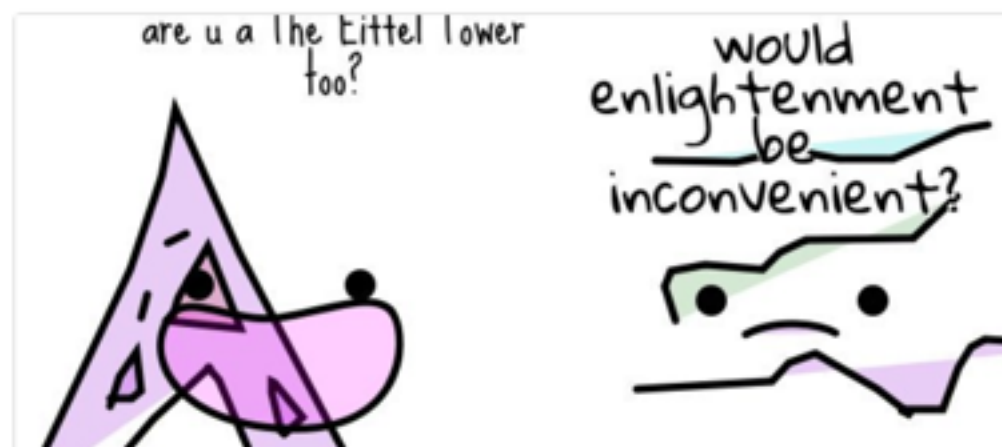
The Sorting Hat Bot @SortingBot · 31 May 2015

ethereal shadow @DepressedDryad · Oct 4
@everyonesai Good evening, botfriend!

everyones a AI @everyonesai
Following

Replying to @DepressedDryad

i wrote u this comic



Josh Moore @Prebuiltlothar · Sep 16
Replying to @DUNSONnDRAGGAN
New game

DUNSONs & DRAGGANs @DUNSONnDRAGGAN · Sep 16
>NEW GAME
Warehouse of the Textiles
You are a level 1 CEO. You have 3HP. You are in the car park.

Josh Moore @Prebuiltlothar · Sep 16
Go south

DUNSONs & DRAGGANs @DUNSONnDRAGGAN · Sep 16
>GO SOUTH.
You are in the Bedroom department.
There is a FARLIG here. It is attempting to eat a frying pan.

Josh Moore @Prebuiltlothar · Sep 16
Inventory

DUNSONs & DRAGGANs @DUNSONnDRAGGAN · Sep 16
>INVENTORY
You are carrying:
beech helm
an unassembled KULLAR
an unassembled HÄRÖ

Josh Moore @Prebuiltlothar · Sep 16
Attack FARLIG

DUNSONs & DRAGGANs @DUNSONnDRAGGAN · Sep 16

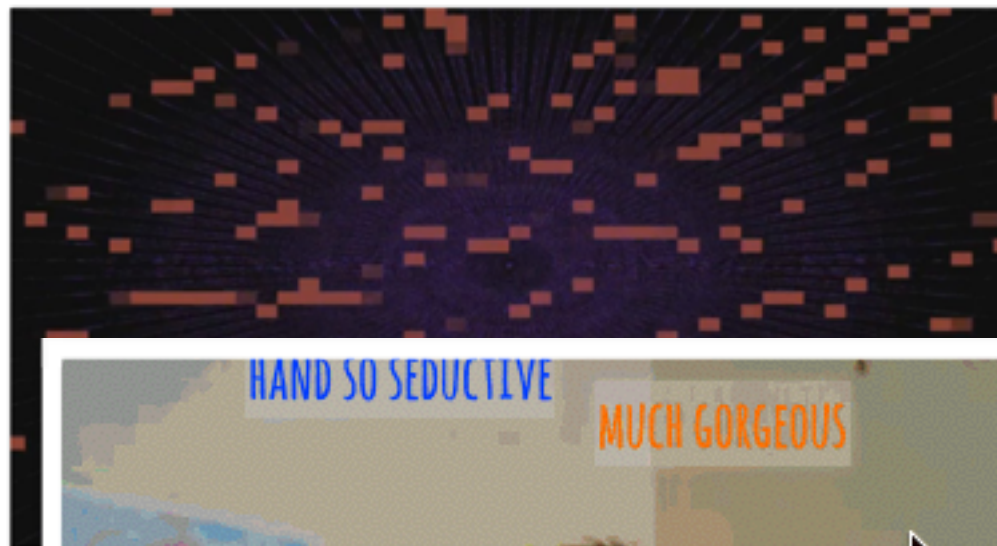
Ways to interact with a generator



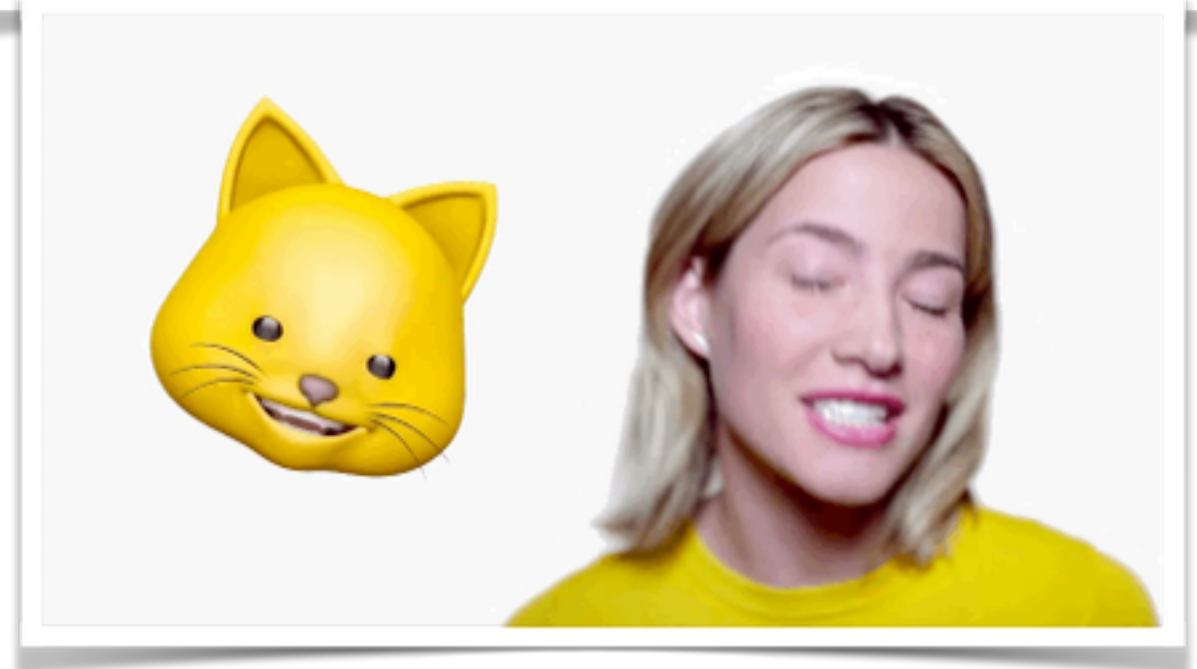
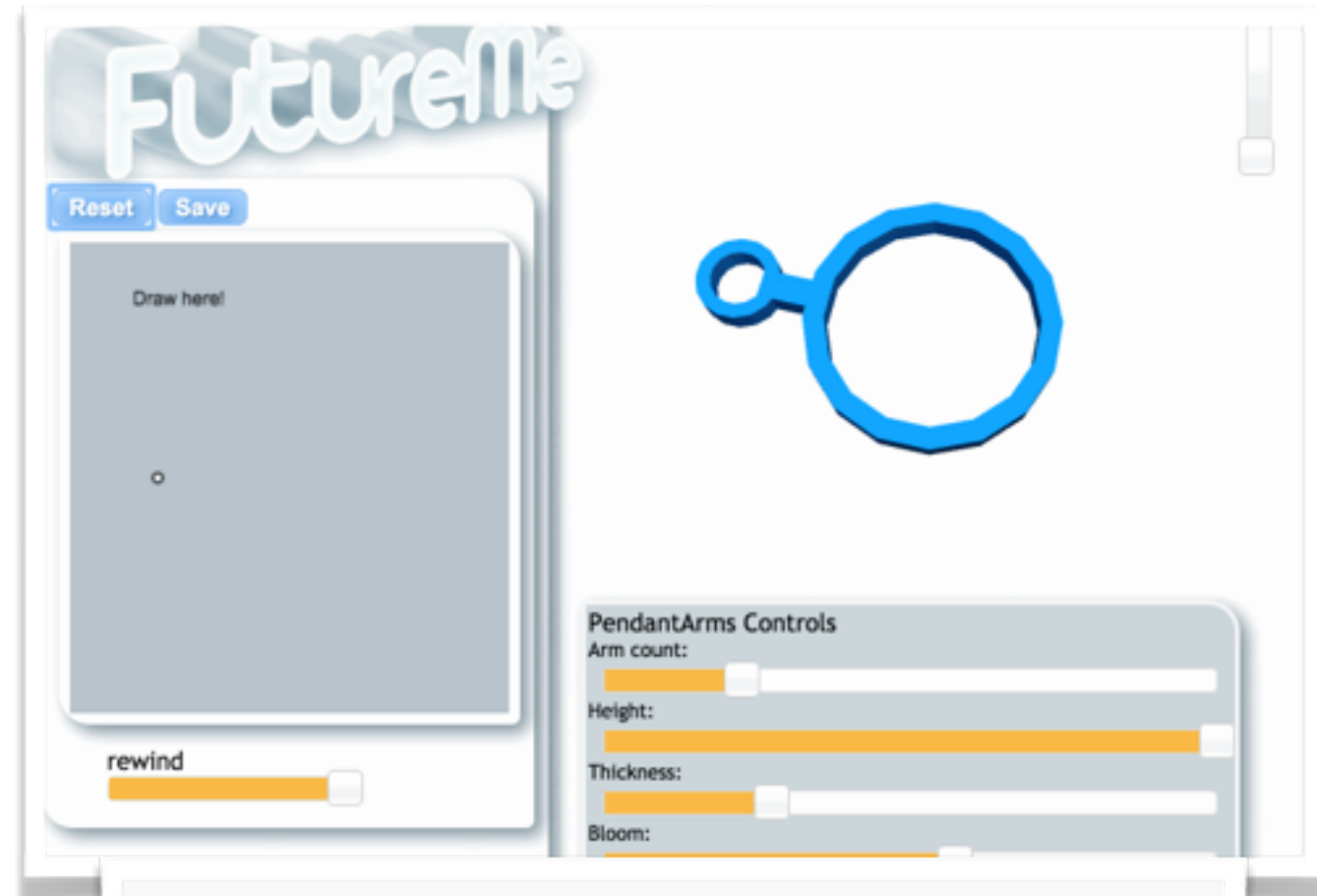
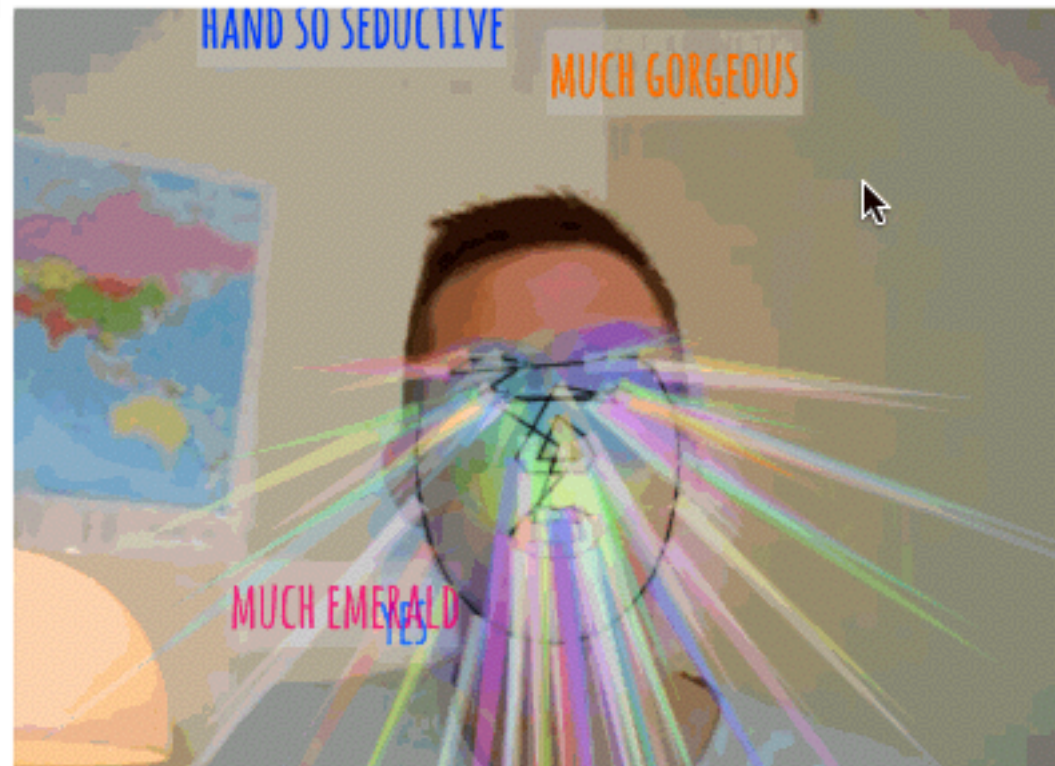
Following

Here it is! Every element in this @kindohm video, including the edit itself, was created entirely algorithmically.

vimeo.com/190071294



10:



You can generate anything

(geometry, sound, texture, text)

and use it for any reason

(art, gameplay, politics, comedy, fashion)

but HOW DO YOU DO IT?

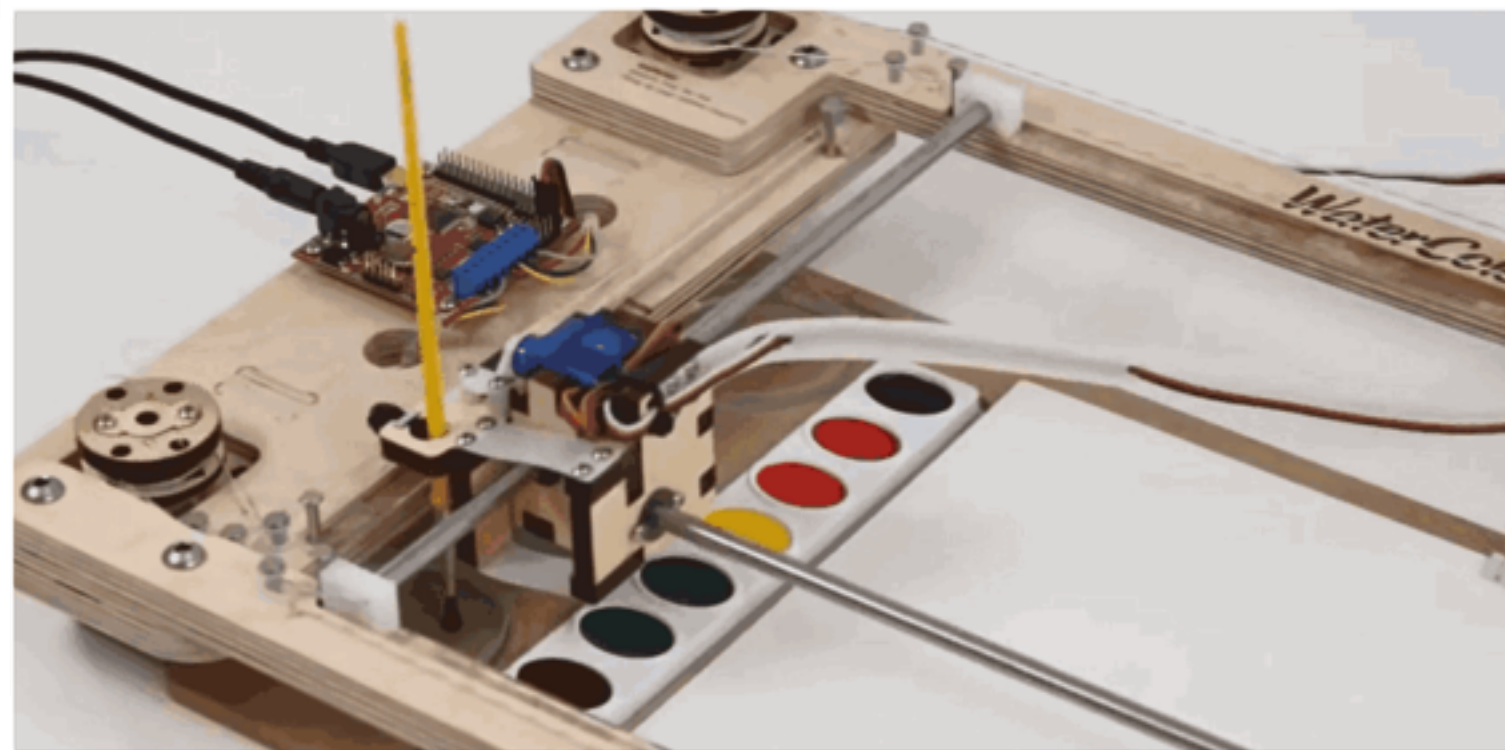
Lets think about making a generator

“Make things that make things”

Mike Cook, organizer of ProcJam



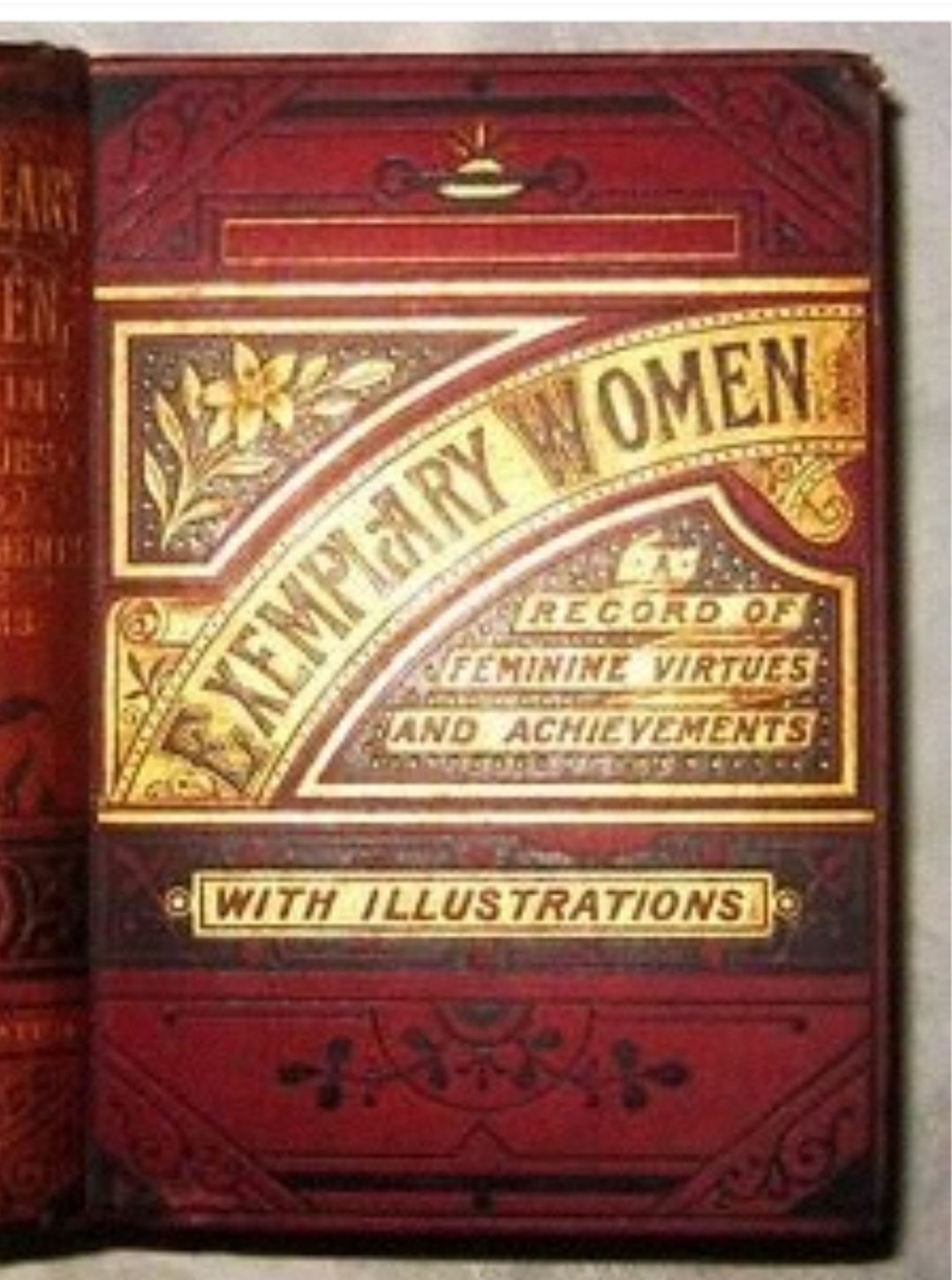
“ARTIST IN A BOX”



Lets think about making a generator

"MAKE THINGS THAT MAKE THINGS"

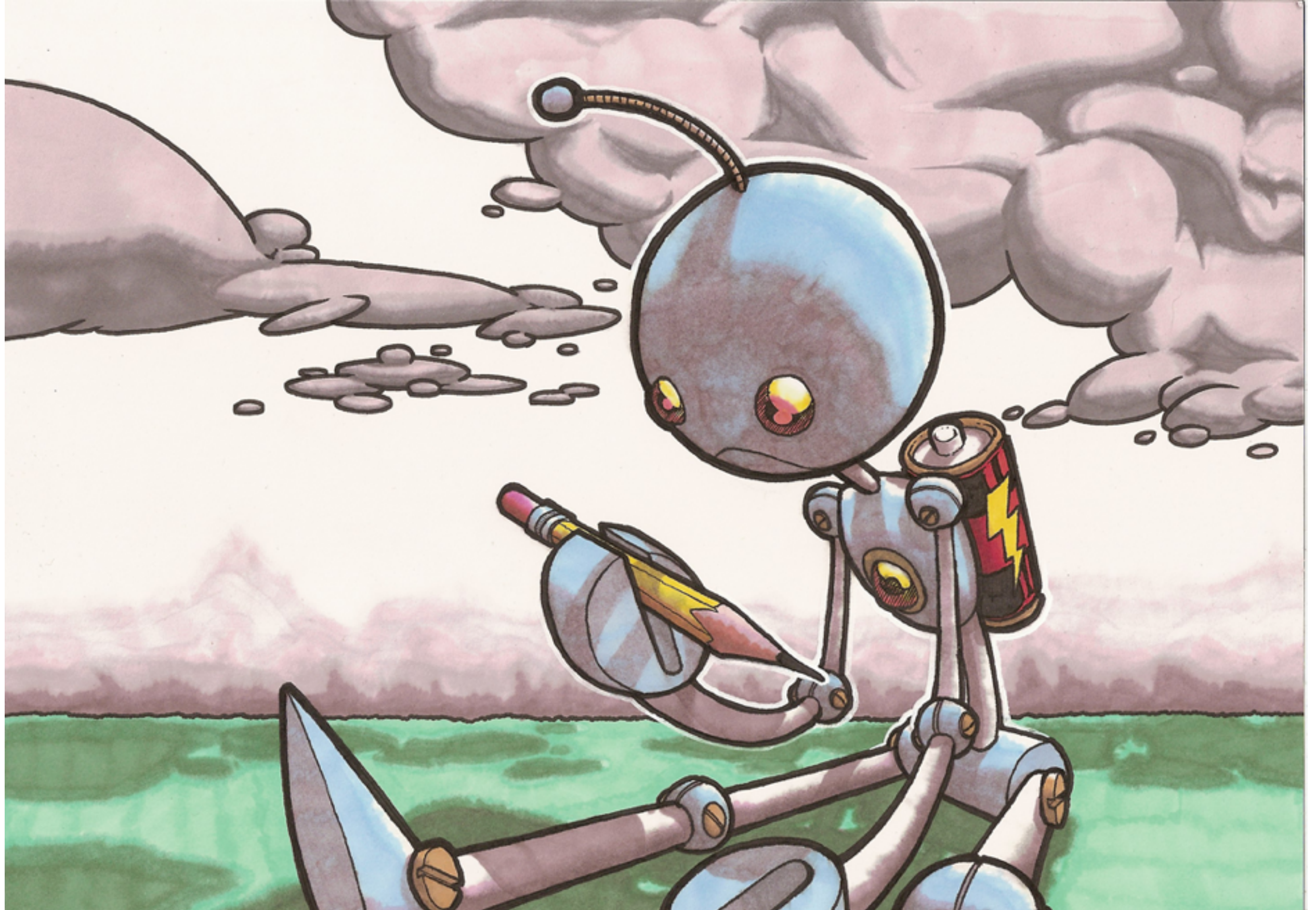
MIKE COOK, ORGANIZER OF PROCJAM



Define your possibility space:

- What are the properties you want?
- What constraints do you have?
- What's bad?
- and what **MUST NOT HAPPEN?**

(Kate Compton "So you want to build a generator...")



...So how do you build it?

Generativity is a pipeline...



Merel Bekking scans the brain of Dezeen founder Marcus Fairs to create his "perfect" design



Your Brain_manufacturing

What if you could create a design based on your inner most feelings by measuring your brain activity? Would you like it? How would you relate to it? These were the central questions for Your Brain_manufacturing, a research project by designer Merel Bekking.

Italian designer [Lucas Maassen](#) wired his brain to an EEG-measuring device and relaxed as he contemplated the word "comfort." Then he and Belgian [Unfold](#) principal Dries Verbruggen translated that brainwave file into instructions for Computer Numerical Control milling machines that carved a block of foam into a biomorphic 3-D couch.



Generativity is a pipeline...

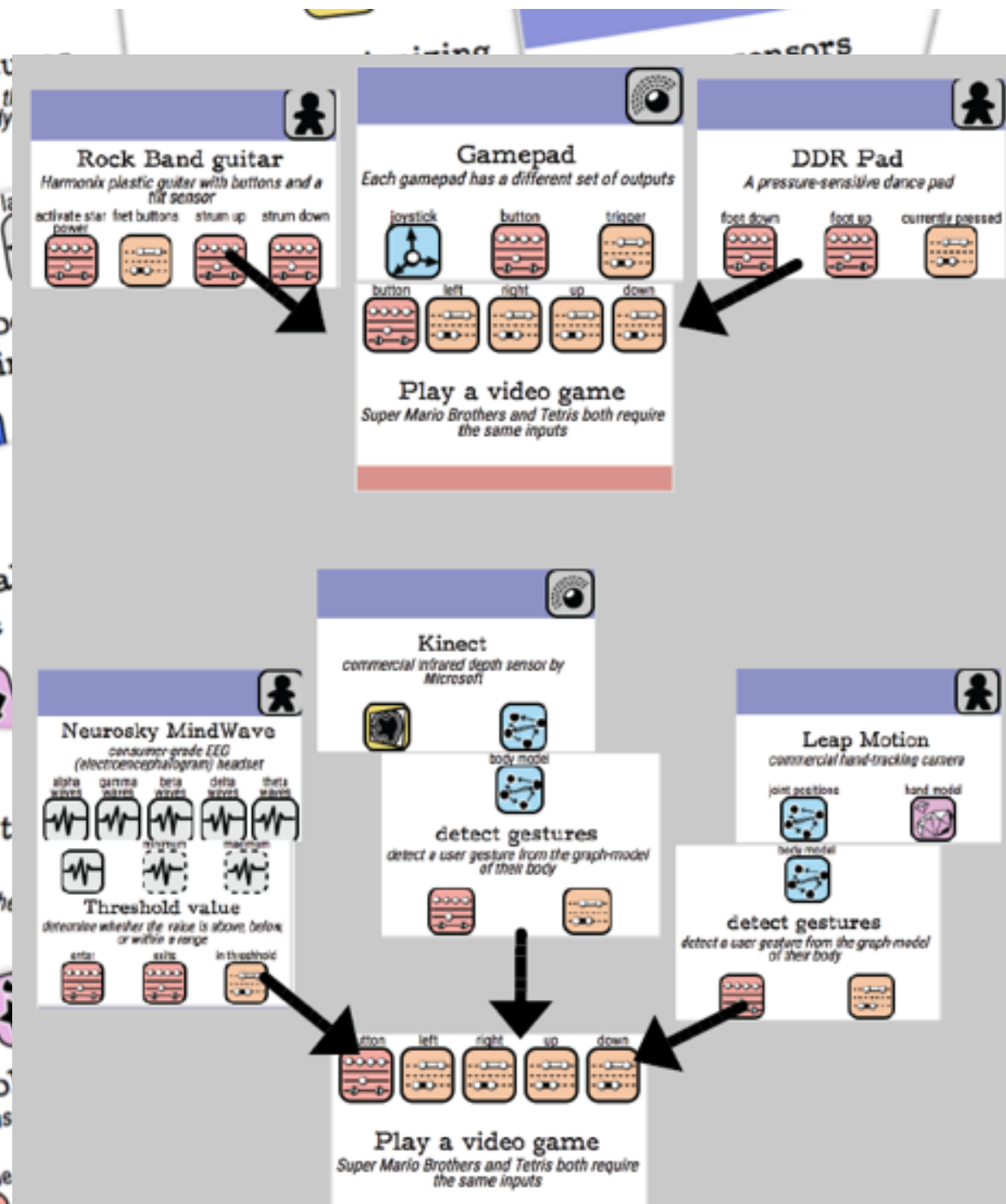
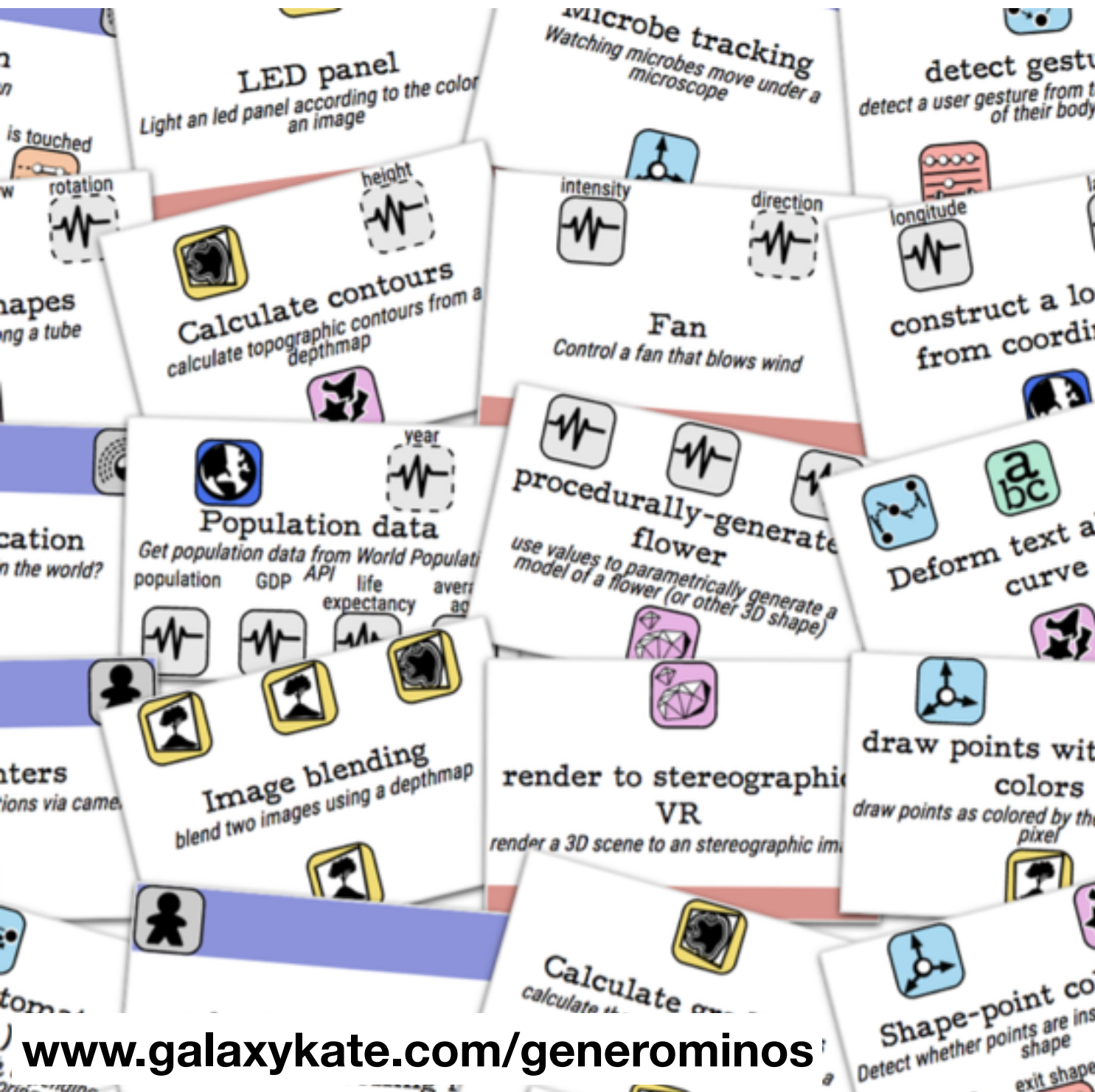
SOME INPUTS



SOME OUTPUTS

Generativity is a pipeline...

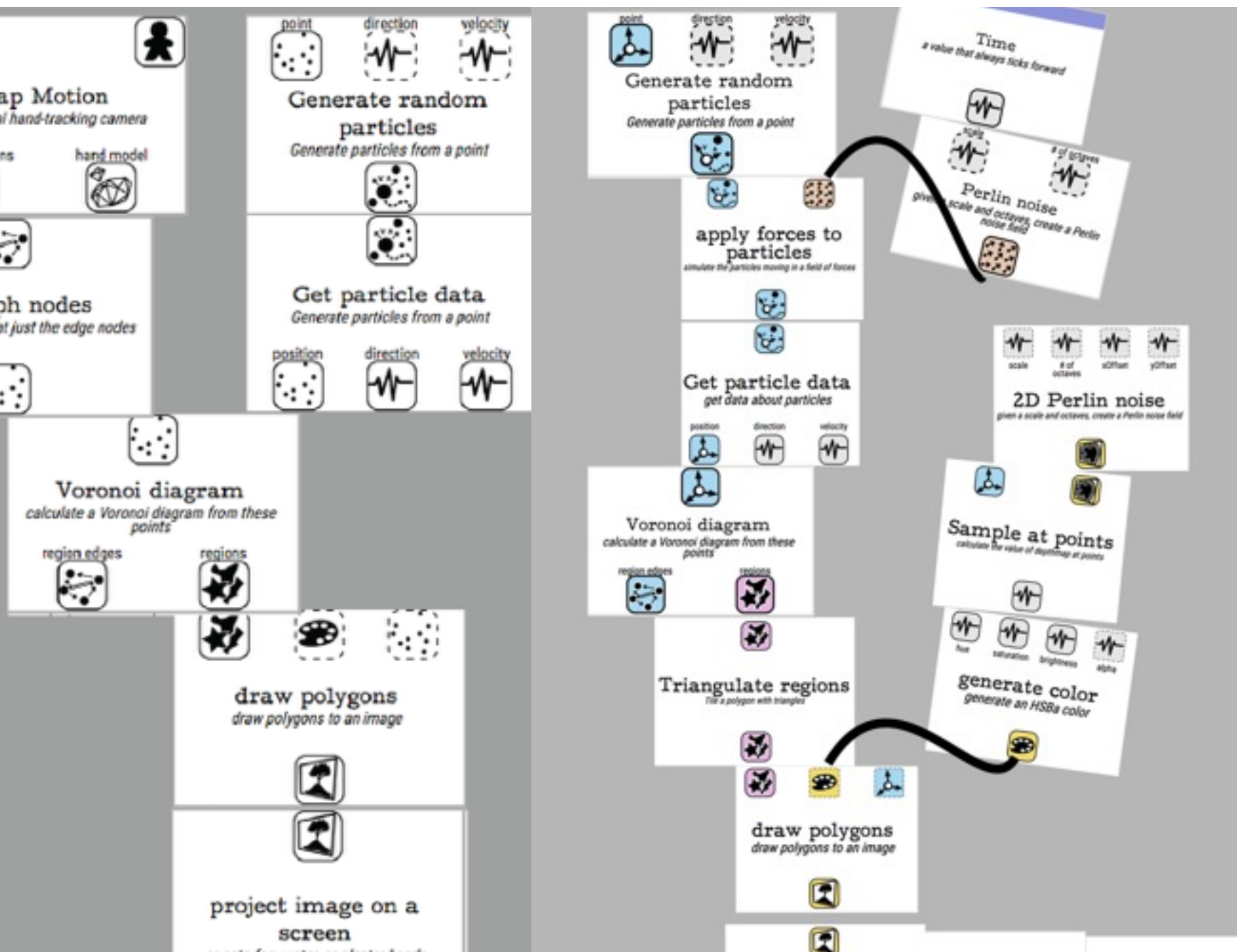
<http://www.galaxykate.com/generominos>



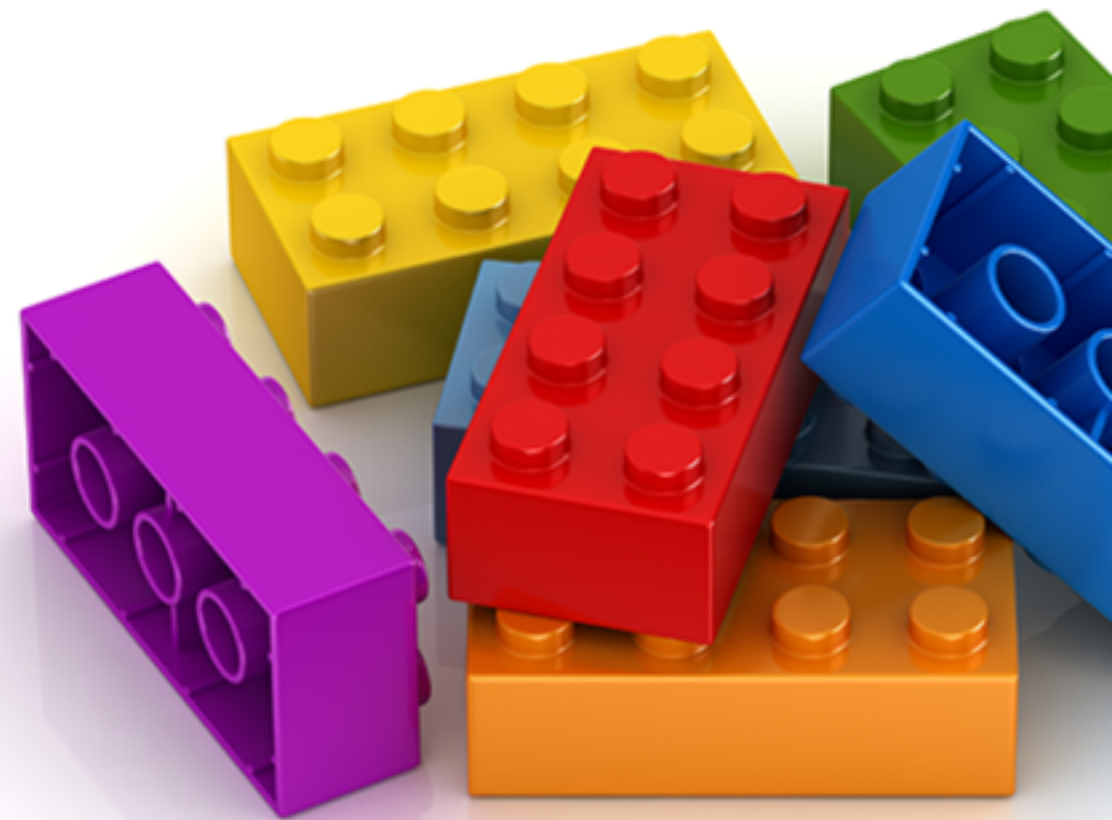
www.galaxykate.com/generominos

Generativity is a pipeline...

<http://www.galaxykate.com/apps/idlehands/>



Generativity is a pipeline...



Generative techniques

- GRAMMARS
- TILES
- PARAMETRIC
- GEOMETRIC TRANSFORMATION
- DISTRIBUTION
- PARTICLES & SIMULATION
- MACHINE LEARNING



Generative techniques

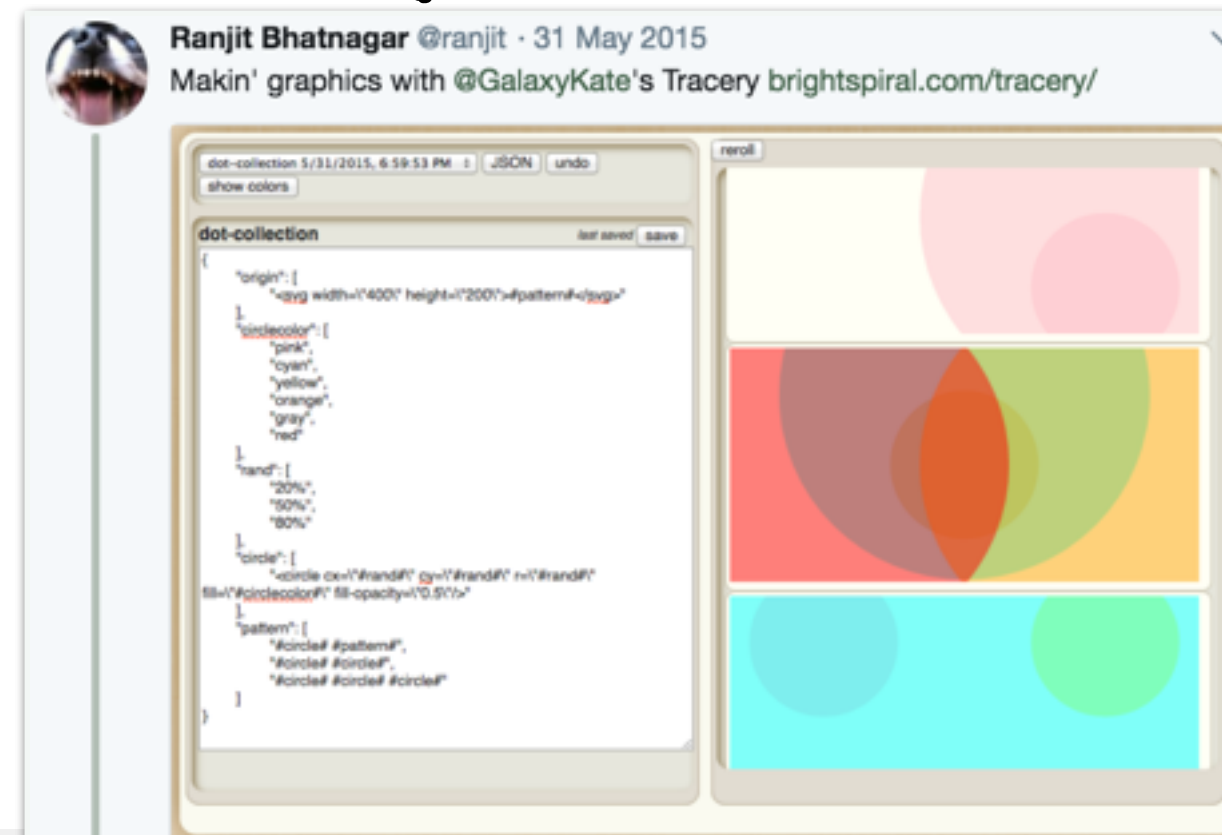
- GRAMMARS
- TILES
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tracery.io

Generative techniques

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- MACHINE LEARNING



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    <text x="10" y="90" style="stroke: #660000; fill: #660000">
      Text grouped with shapes</text>
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```

tracery.io

Generative techniques

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tracery.io

A GENERATIVE FRAMEWORK OF GENERATIVITY, COMPTON AND MATEAS 2017

Generative techniques

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https://diablo.gamepedia.com/Map_Generation

Generative techniques

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WOLFGANG AMADEUS MOZART

Musikalisches Würfelspiel

Table of Measure Numbers

Part One

	I	II	III	IV	V	VI	VII	VIII
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

Part Two

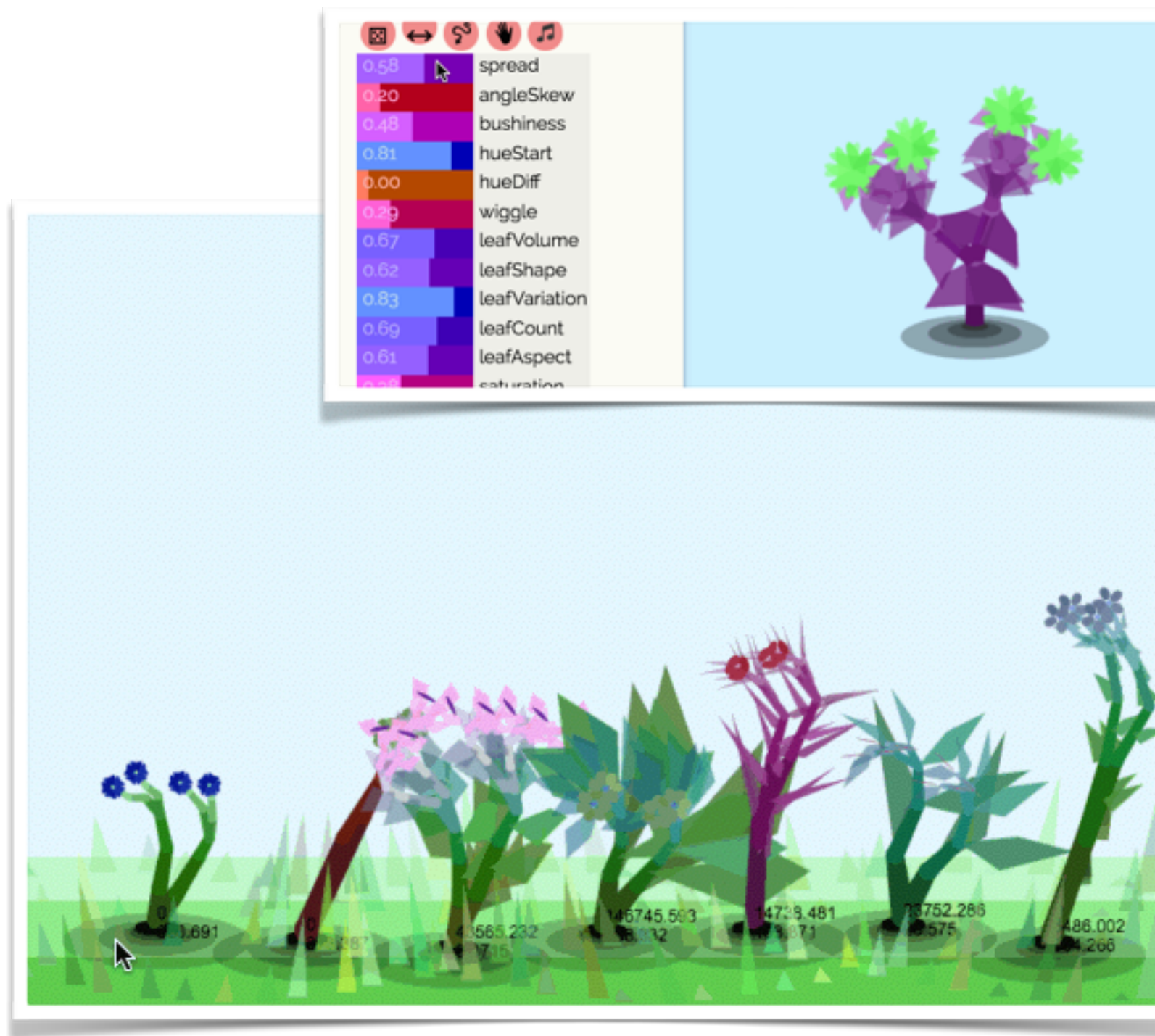
	I	II	III	IV	V	VI	VII	VIII
2	70	121	26	9	112	49	109	14
3	117	39	126	56	174	18	116	83
4	66	139	15	132	73	58	145	79
5	90	176	7	34	67	160	52	170
6	25	143	64	125	76	136	1	93
7	138	71	150	29	101	162	23	151
8	16	155	57	175	43	168	89	172
9	120	88	48	166	51	115	72	111
10	65	77	19	82	137	38	149	8
11	102	4	31	164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

Table of Measures



Generative techniques

- GRAMMARS
- TILES
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- DISTRIBUTION
- PARTICLES & SIMULATION
- MACHINE LEARNING



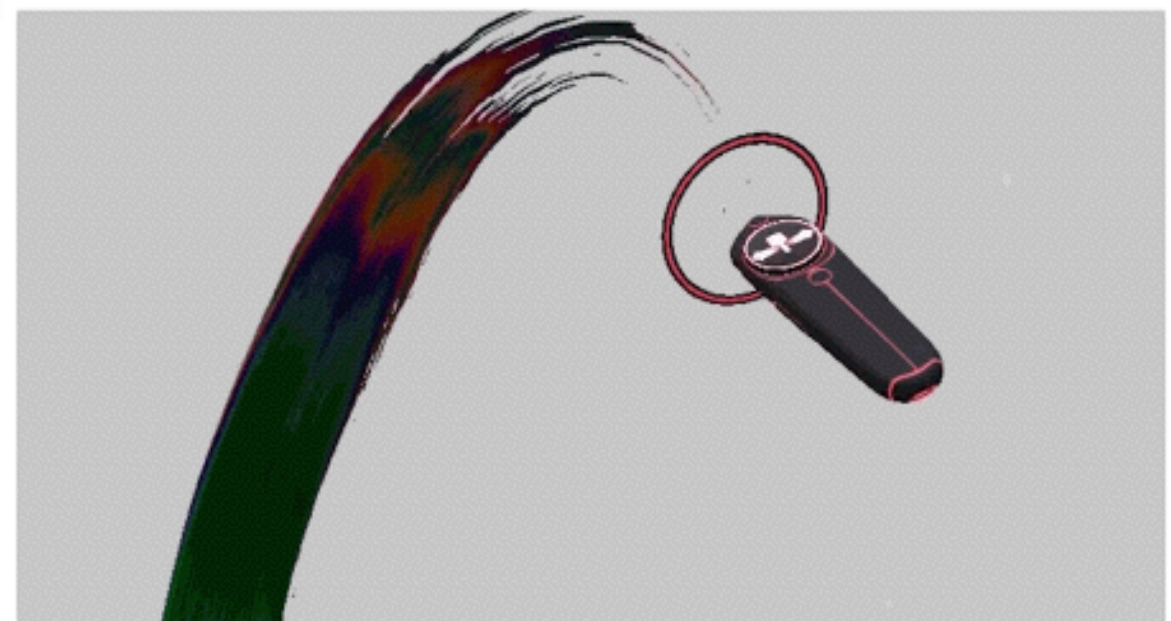
Generative techniques

- GRAMMARS
- TILES
- PARAMETRIC
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- DISTRIBUTION
- PARTICLES & SIMULATION
- MACHINE LEARNING

IOBrush
Tangible Media group

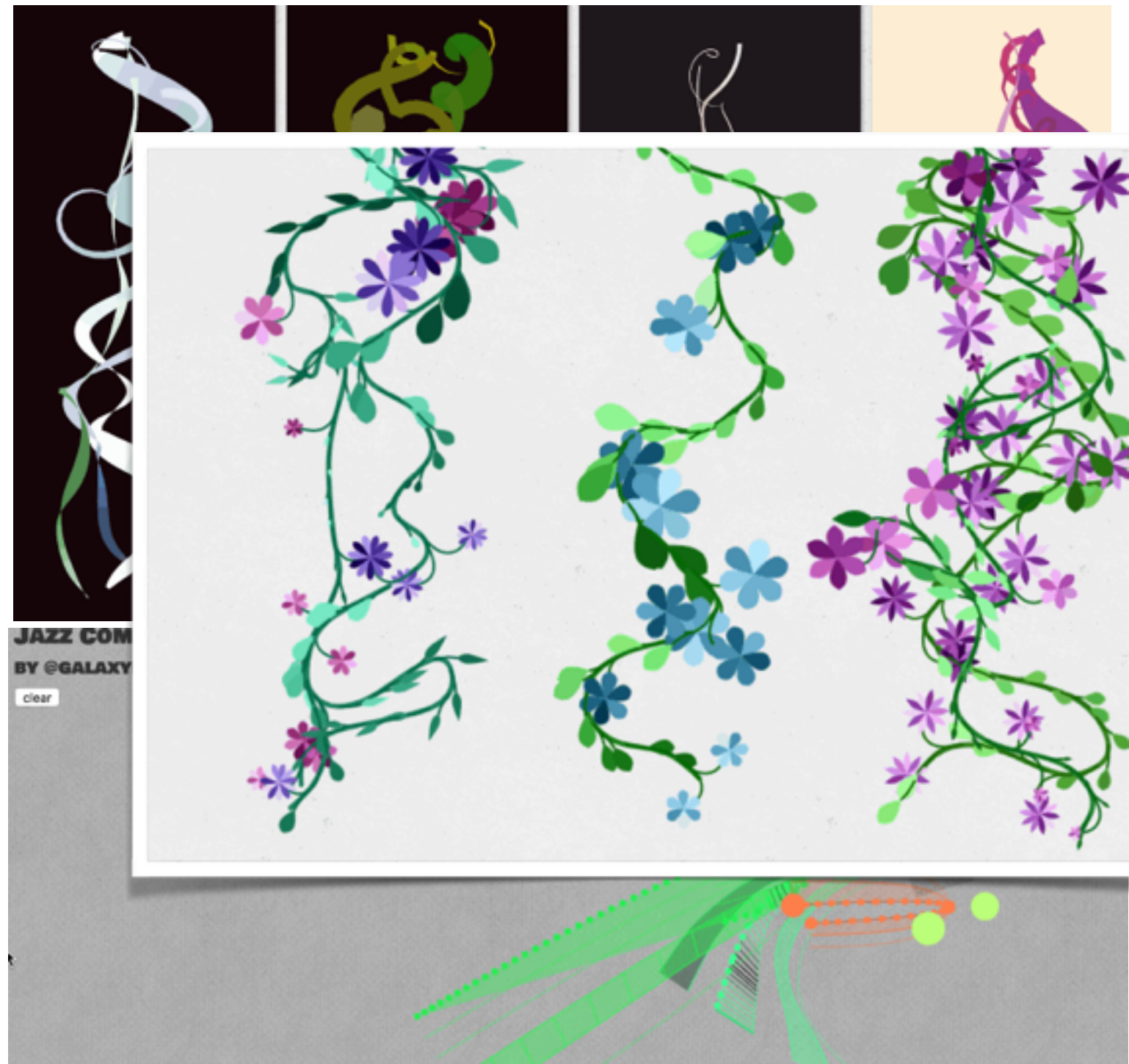


Tiltbrush
Google



Generative techniques

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Generative techniques

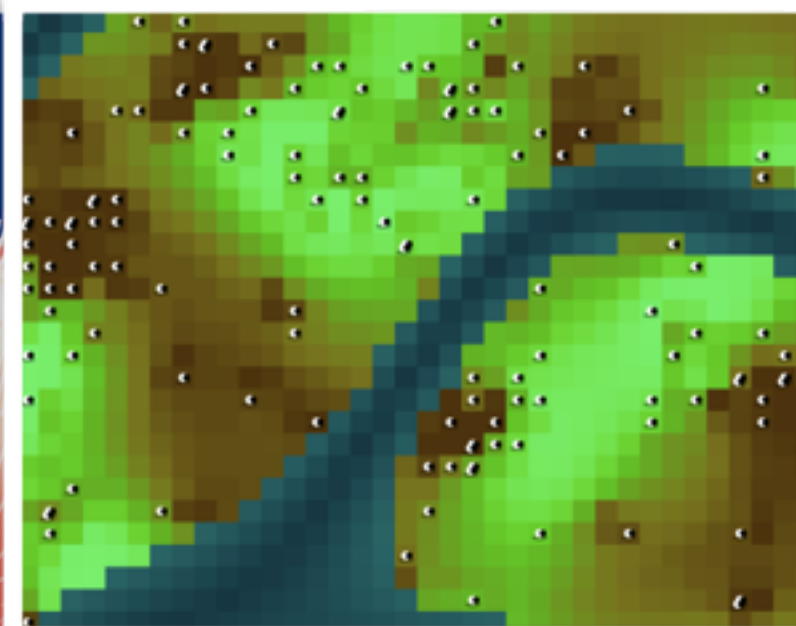
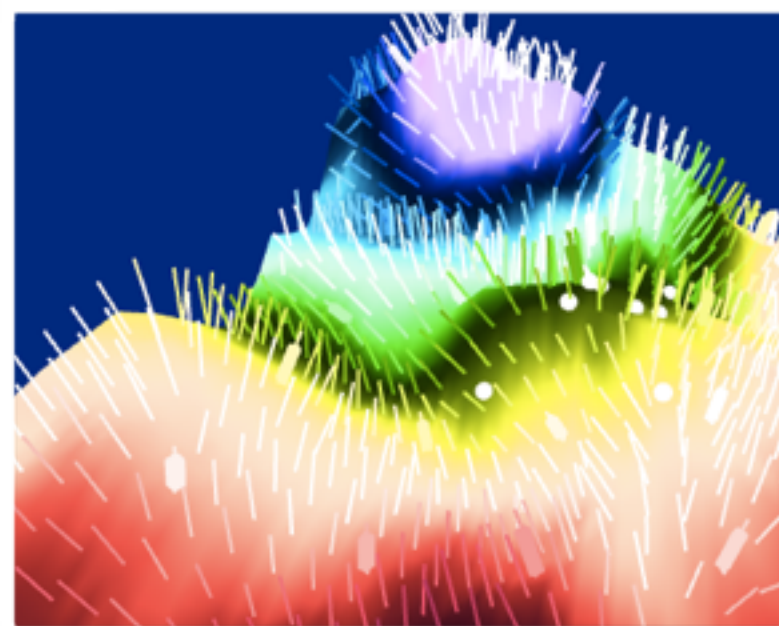
- GRAMMARS
- TILES
- PARAMETRIC
- GEOMETRIC TRANSFORMATION
- DISTRIBUTION
- PARTICLES & SIMULATION
- MACHINE LEARNING



Treachery of Sanctuary, Chris Milk

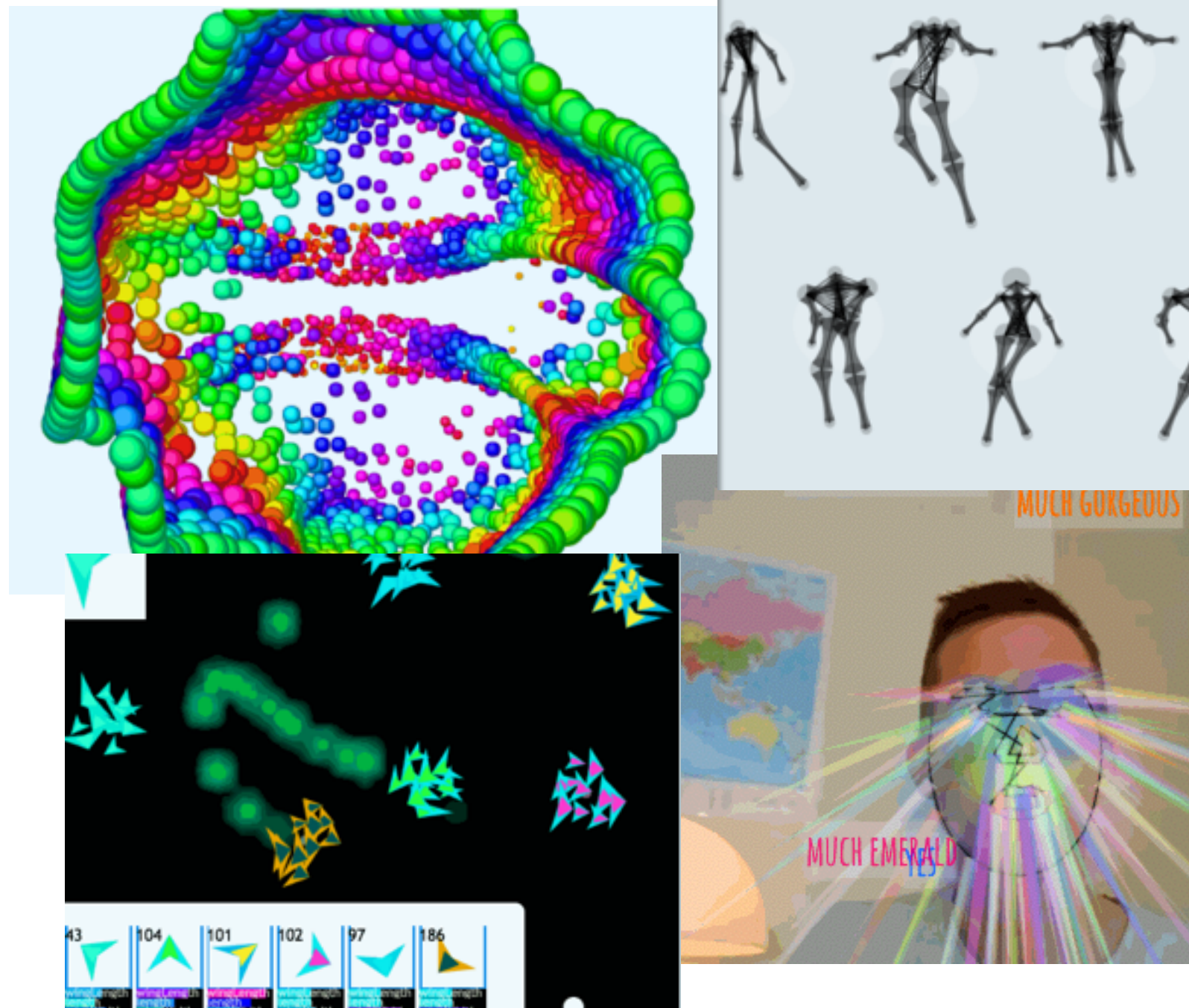
Generative techniques

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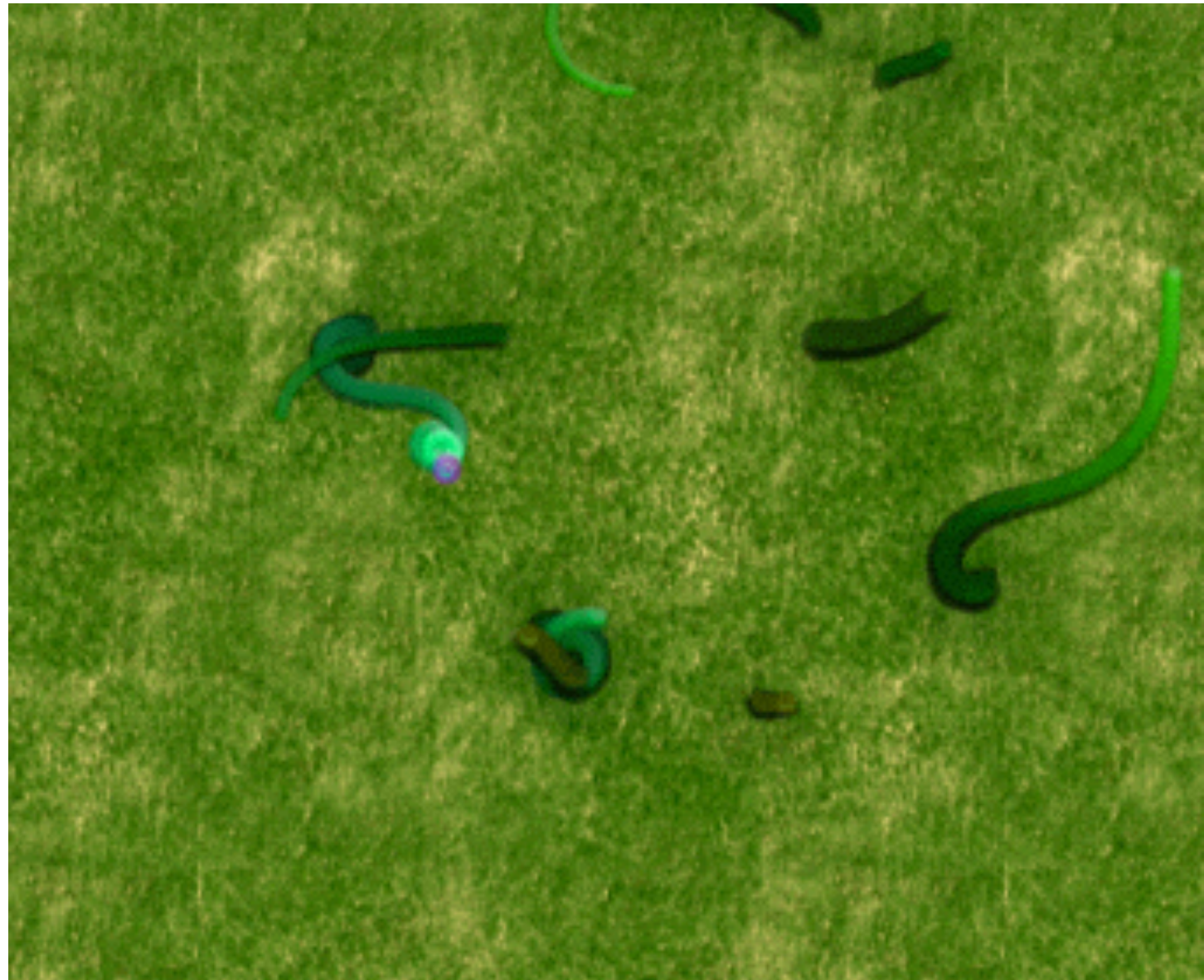
Generative techniques

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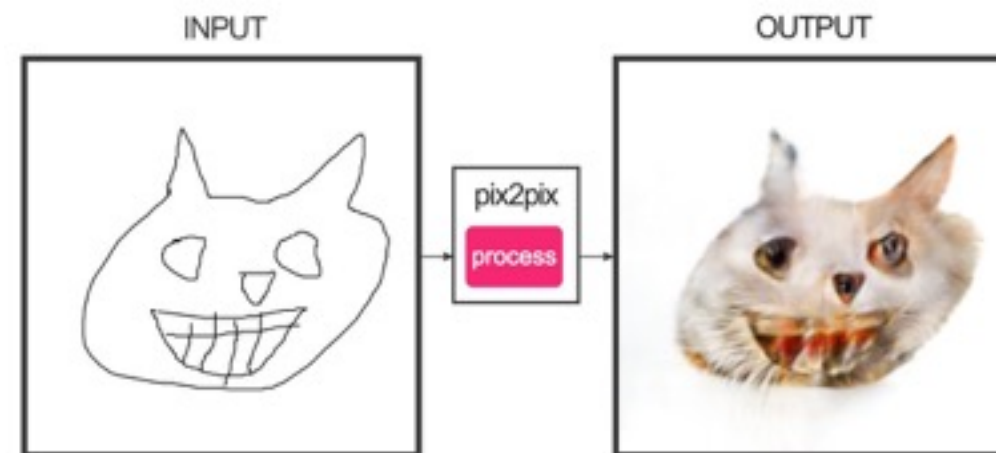
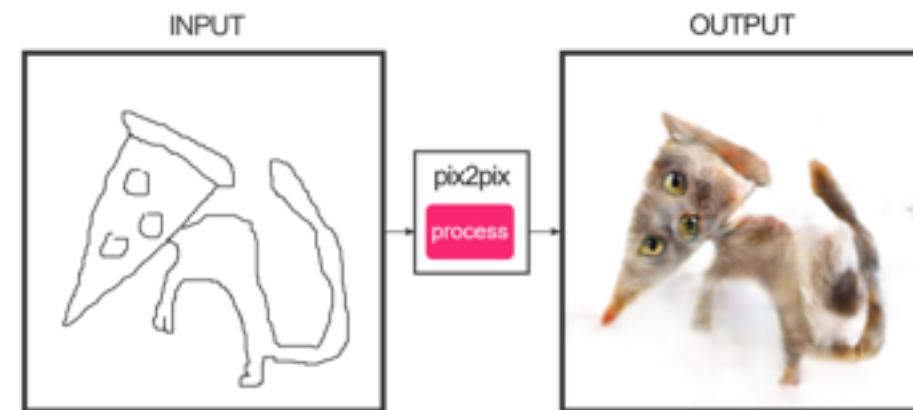
Generative techniques

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Generative techniques

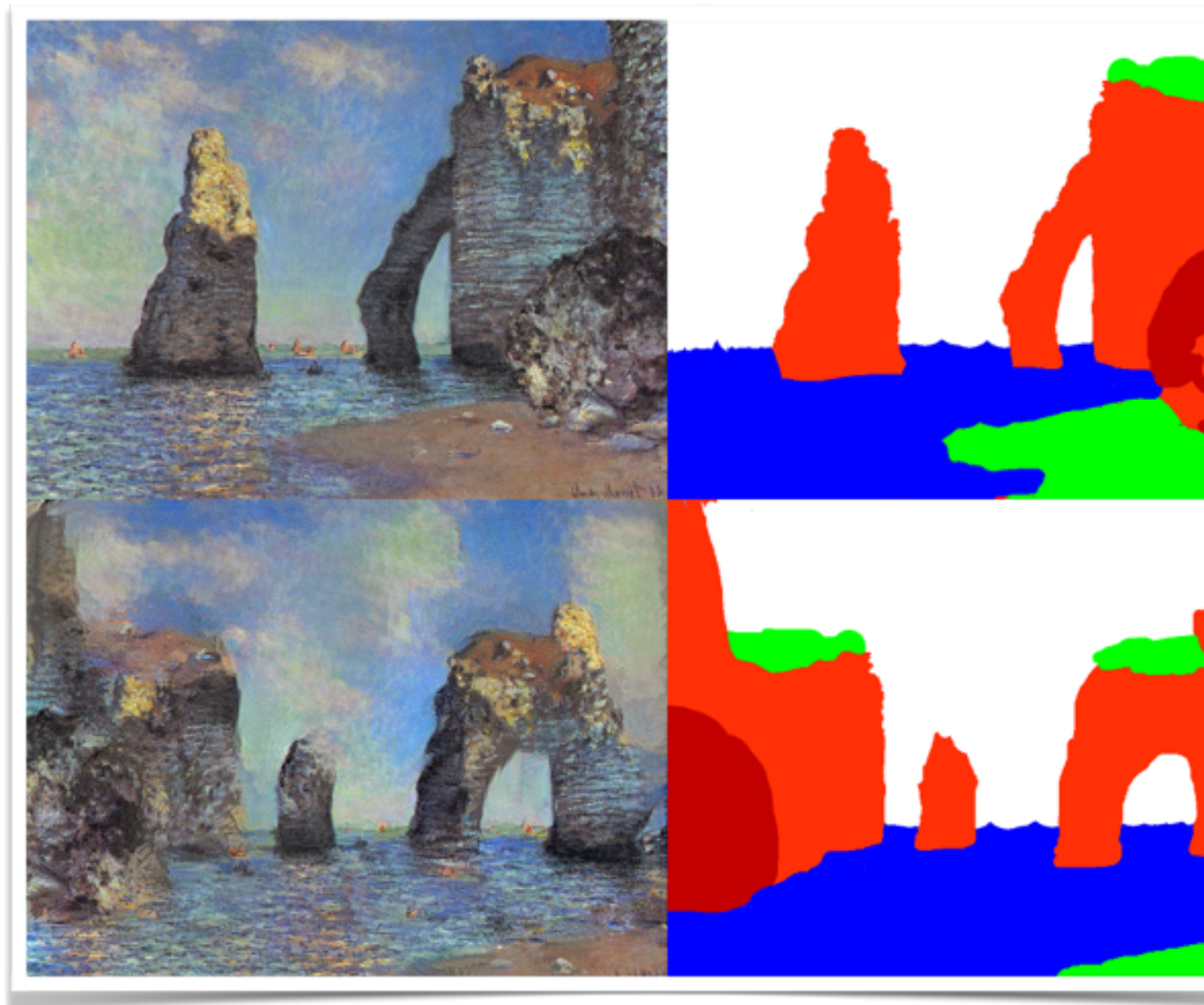
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<https://affinelayer.com/pixsrv/index.html>

Generative techniques

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Alex Champandard, Neural Doodle

Generativity in Javascript

JAVASCRIPT HAS MANY FEATURES WELL-SUITED FOR GENERATIVITY

- FLEXIBLE DATA STRUCTURES
- ✨FUNCTIONAL PROGRAMMING✨
- JQUERY, SELECTORS AS A PATTERN
- CHAIN SYNTAX LENDS ITSELF TO GENERATIVE CHAINS
- (PYTHON IS GOOD TOO, JUST NOT AS NATIVELY INTERACTIVE)

map, filter, and reduce
explained with emoji 🤔

```
map([🐮, 🍌, 🐔, 🌽], cook)  
=> [🍔, 🍟, 🍗, 🍿]
```

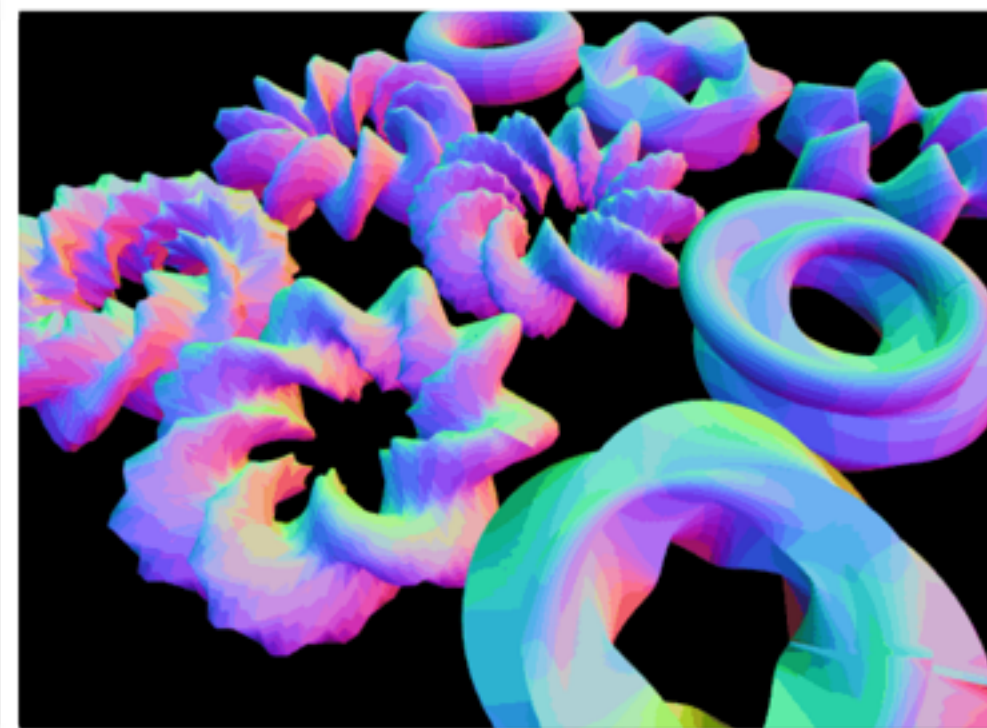
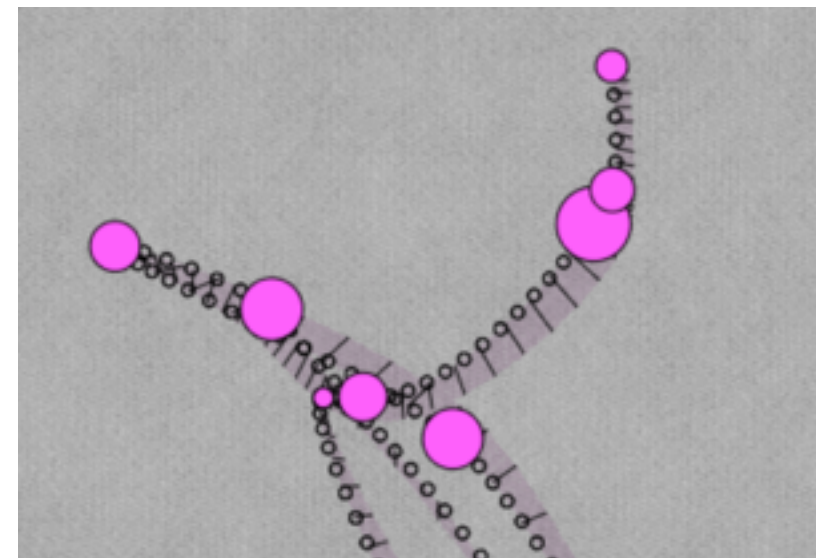
```
filter([🍔, 🍟, 🍗, 🍿], isVegetarian)  
=> [🍟, 🍿]
```

```
reduce([🍔, 🍟, 🍗, 🍿], eat)  
=> 🤩
```

Generativity in Javascript

JAVASCRIPT HAS MANY GENERATIVE LIBRARIES

- DANCER.JS
- RHILL VORONOI
- TRACERY & BOTTERY
- SVG, CANVAS, THREE.JS, PROCESSING



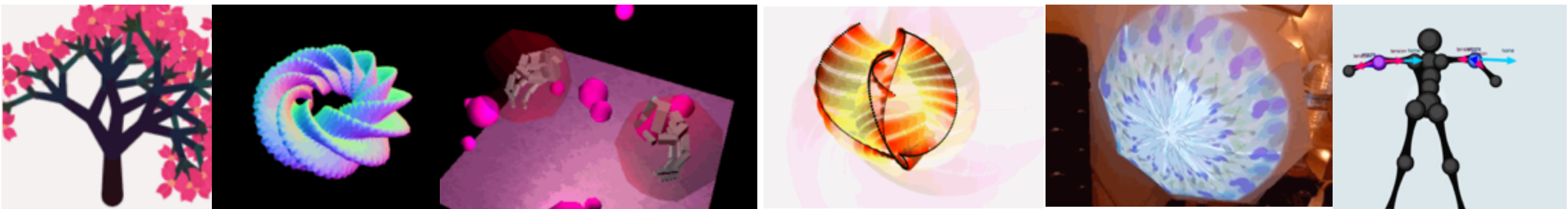
Generativity in Javascript

JAVASCRIPT PLAYS WELL WITH UNUSUAL INTERFACES

- TWITTER DATA
- BIG DATA APIs
- LEAP MOTION
- MOUSE GESTURES
- 3D PRINTING APIs
 - (BUT NO MORE SPOONFLOWER)



Generativity in Javascript



JAVASCRIPT HAS MANY FEATURES WELL-SUITED FOR GENERATIVITY

JAVASCRIPT HAS MANY GENERATIVE LIBRARIES

JAVASCRIPT PLAYS WELL WITH UNUSUAL INTERFACES

WHAT WILL YOU BUILD?

QUESTIONS? @GALAXYKATE