PV259
Generative Design Programming
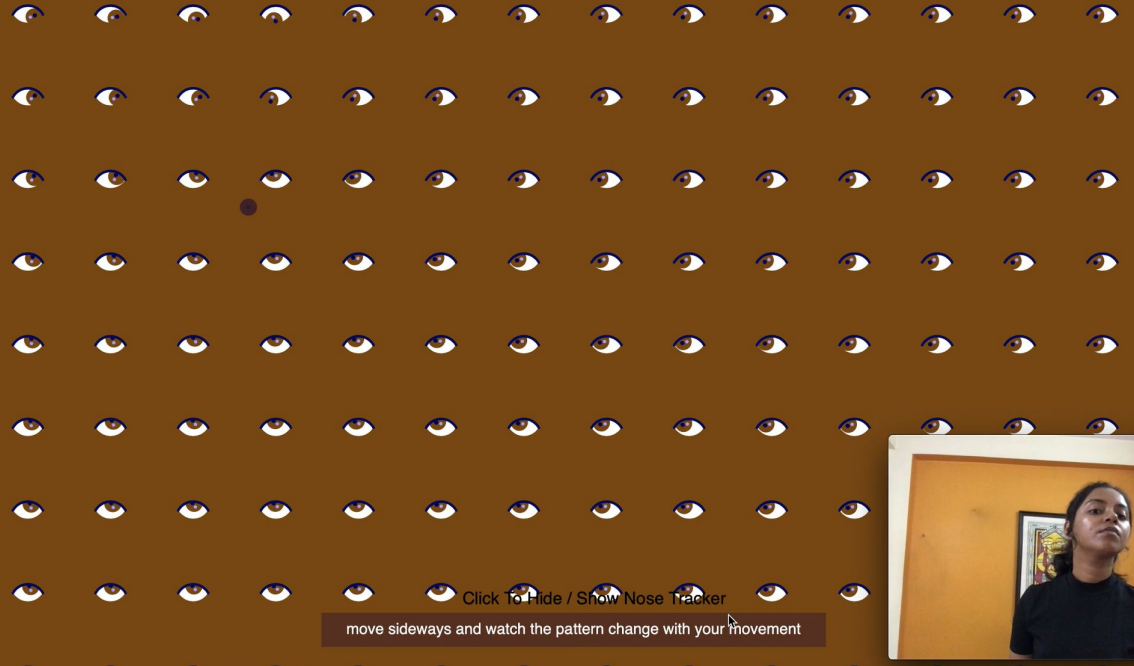
Week 9
Machine learning

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FI

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→ INTERACTIVE APP

Magnetic vision

Krishnokoli Roychakraborty, 2020

The numerous eyes tend to follow a singular point almost like a frenzy. This piece was designed to generate a sense of how herd mentality functions. It shows how a singular point can garner extreme attention and judgement from observers. Herd mentality is a state where people can be influenced by their peers to adopt certain behaviours on a largely emotional, rather than rational, basis.

Click To Hide / Show Nose Tracker

move sideways and watch the pattern change with your movement

Video, p5 editor

→ INTERACTIVE APP

Blooming binary trees

Krishnokoli Roychakraborty, 2020

In book 'Nature of Code', Schiffman explains how fractals can be interpreted as the visual depictions of tree branches, lightning bolts or mountains. This unique visualisation along with the concept of social afforestation was the motivation behind this piece. Like the idea of social afforestation which requires active human participation for forestry this piece's interactivity lies in proximity of the viewer and the screen.

Check out <u>other examples from Krishnokoli</u>

<u>**Video, p5 editor**</u>
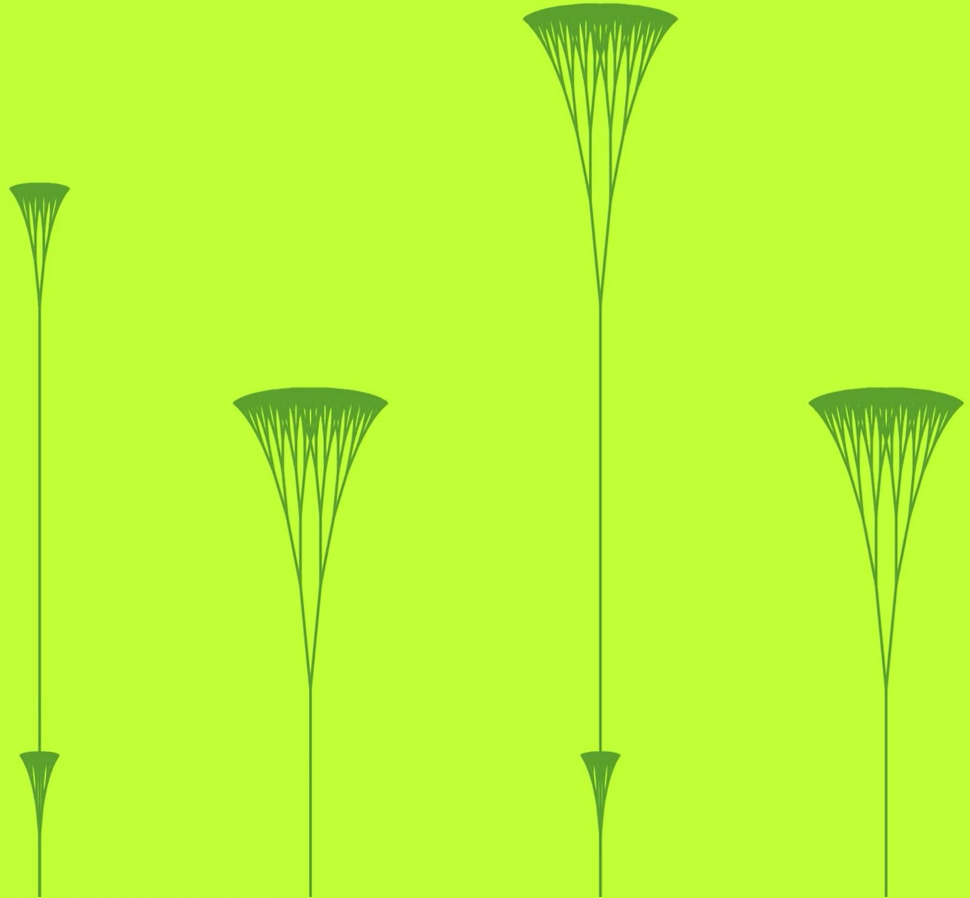
→ INTERACTIVE APP

Infinite Herbarium

Caroline Rothwell

Using similar technology to that which powers Google Lens, participants are invited to create a plant 'morph'. Two plants are identified. The visual characteristics of those plants are fed into a ML model that has been trained to generate mutating plant images through exposure to scientific illustration data, made available in the open source Biodiversity Heritage Library.

https://infiniteherbarium.withgoogle.com/

1 Open the QR code below on your phone or tablet
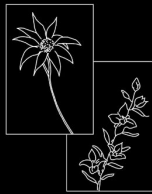
2 Photograph two plant specimens

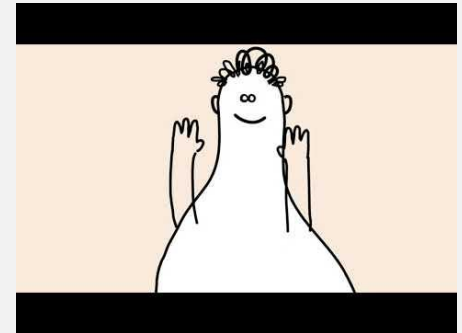3 Watch a hybrid species evolve as a morphing, generated artwork

→ INTERACTIVE APP

Scroobly

Google & bit.studio, 2020

https://www.scroobly.com/

Start

→ INTERACTIVE APP

Interplay Mode

Google

https://experiments.withgoogle.com/interplay-mode/view/

People watch videos everyday to learn new things. But what if you could do more than just watch? What if there could be interplay between you and the video creator? These prototypes let you interact right alongside the video and practice what you just saw.

→ INTERACTIVE APP, AUDIO

Robot Neil's Bubble Bath

Tero Parviainen (Teropa), 2020
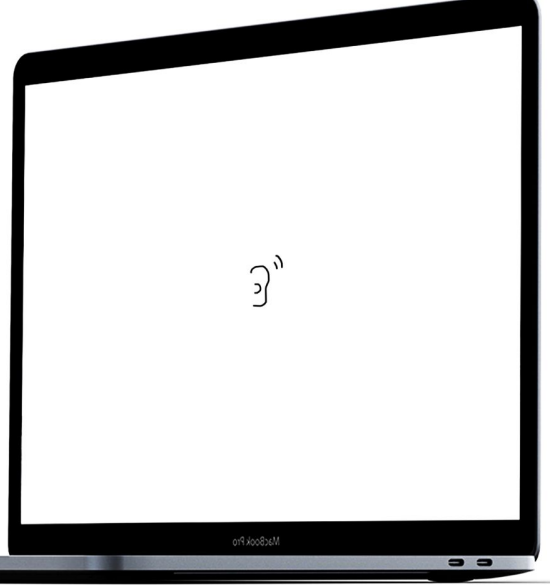
Lots of other cool examples on music:
https://codepen.io/teropa/pens/public

"There is a bird flying above the sea."

Scribbling Speech

Xinyue Yang, 2018

xinyue.de/scribbling-speech

Language and images are closely intertwined: We think in pictures and we explain facts as spatial constellations. What if the spoken word could be transformed into dynamic visual worlds in real time? Speech input, machine learning and recurrent neural networks for image generation allow to computer generate complex imaginary worlds that follow the narrator and thus create complex animations controlled by linguistic structures.
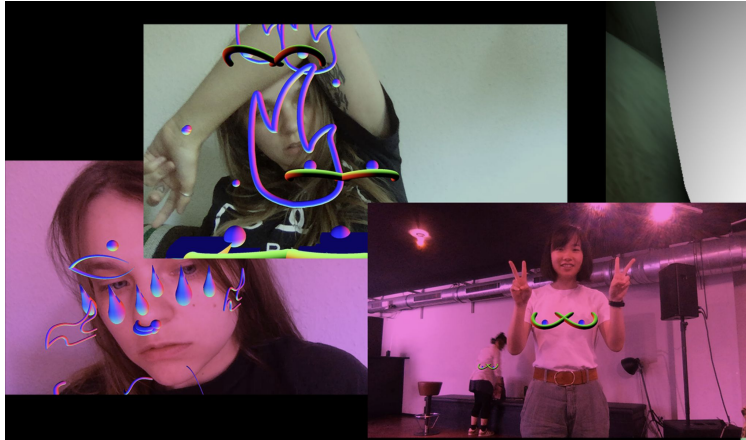
(Bc. thesis)
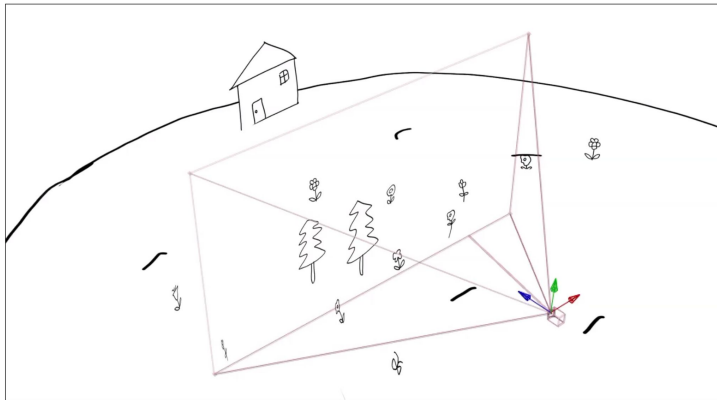
"I look to the left/right." - Rotating to the left/right view

Other examples

Let's read a story – The project takes the corpus of Aesop fables and investigates the possibility of exploring the connections between different characters and ideas from the original fables in a new and fun way using machine learning language models.

AR body filters

Quick, draw! – Google

→ VIDEO

unstoPEPPAble

Jan Pokorný, 2021

www.generativedesign.cz/archive/unstopeppable

All good things have an end. Thankfully, computer-generated Peppa Pig cartoons are not a good thing, and also have no end. They make just enough sense to be uncanny, and just enough nonsense to be on the edge between 'dark' and 'hilarious'. And what is more, you cannot stop them — they're unstoPEPPAble. A text-generating neural network (trained on the whole of the Internet), a state-of-the-art set of TTS voices (meant to help the visually impaired) and a bunch of video and image editing tools are misused with one goal in mind: destroying your childhood.

Basic terminology

ML – machine learning

model – machine learning program

training

pre-trained models

transfer-learning

https://ml5js.org/

What we can do with ml5.js?

BodyPose
Full-body pose estimation

HandPose
Hand-skeleton finger tracking

FaceMesh
Facial landmark detection

ImageClassifier
Image content recognition

SoundClassifier
Audio detection and classification

ml5 NeuralNetwork
Train your own neural networks

Example sketches

Getting output from webcam:
https://editor.p5js.org/mrehacek/sketches/3_nNWmIIe

PoseNet: detecting person (skeleton tracking)
https://editor.p5js.org/mrehacek/sketches/RIP1tEMY2

MobileNet: detect objects in images
https://editor.p5js.org/mrehacek/sketches/xISNXPZ5L

Teachable Machine
(transfer learning – create own model)
https://teachablemachine.withgoogle.com/

All resources

1. <u>ml5.js</u> – library for p5.js to start playing with ML
2. <u>Experiments with Google</u> examples
3. <u>Coding Train: Beginner's Guide to Machine Learning in JavaScript with ml5.js</u> – video series about all
4. <u>ML x Art</u> examples
5. <u>ML4A</u> complex examples
6. <u>Awesome-AI-art github</u> – list of all software, people, etc. regarding AI in arts
7. <u>NVIDIA</u> examples
8. <u>RunwayML</u> – software with more "complex" models