Intelligent Design

Kevin Nørby Andersen, October 2024

Today

9.00

Introduction to teacher and course

9.30

What is intelligence? Talk and discussion

10:30

Exercise 1: Introduction to classification with Teachable Machine and P5js

Rest of day

Exercise 1 with Kevin as support

Teacher

Kevin Nørby Andersen
owner / designer / developer at super ultra

Previously:

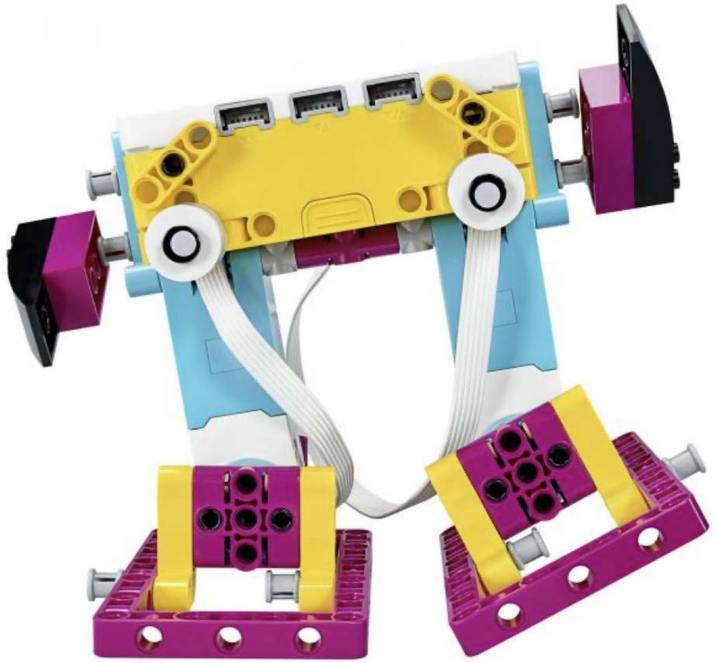
Bang & Olufsen
MIT Media Lab
The LEGO Group
Kollision

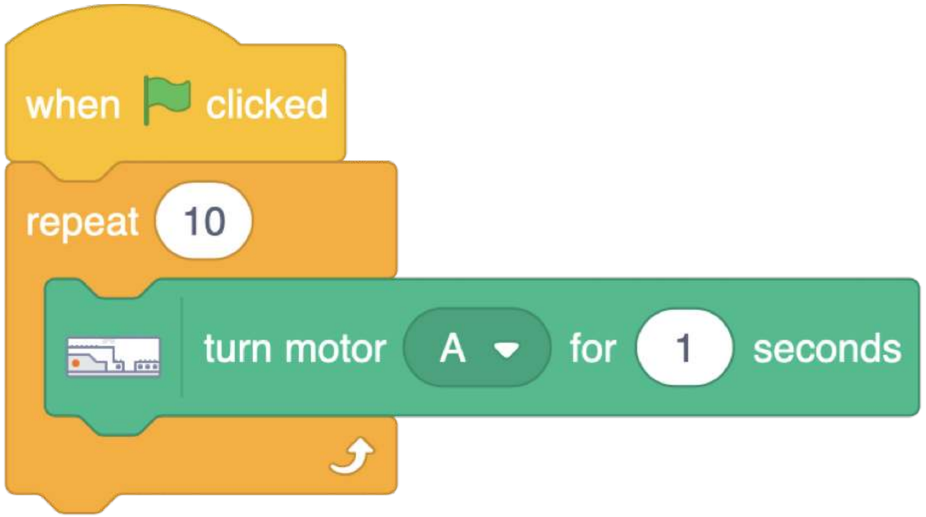
MSc Industrial Design, TU Eindhoven
BSc IT Product Design, Aarhus University

super ultra

Salling Lights
kollision
2014

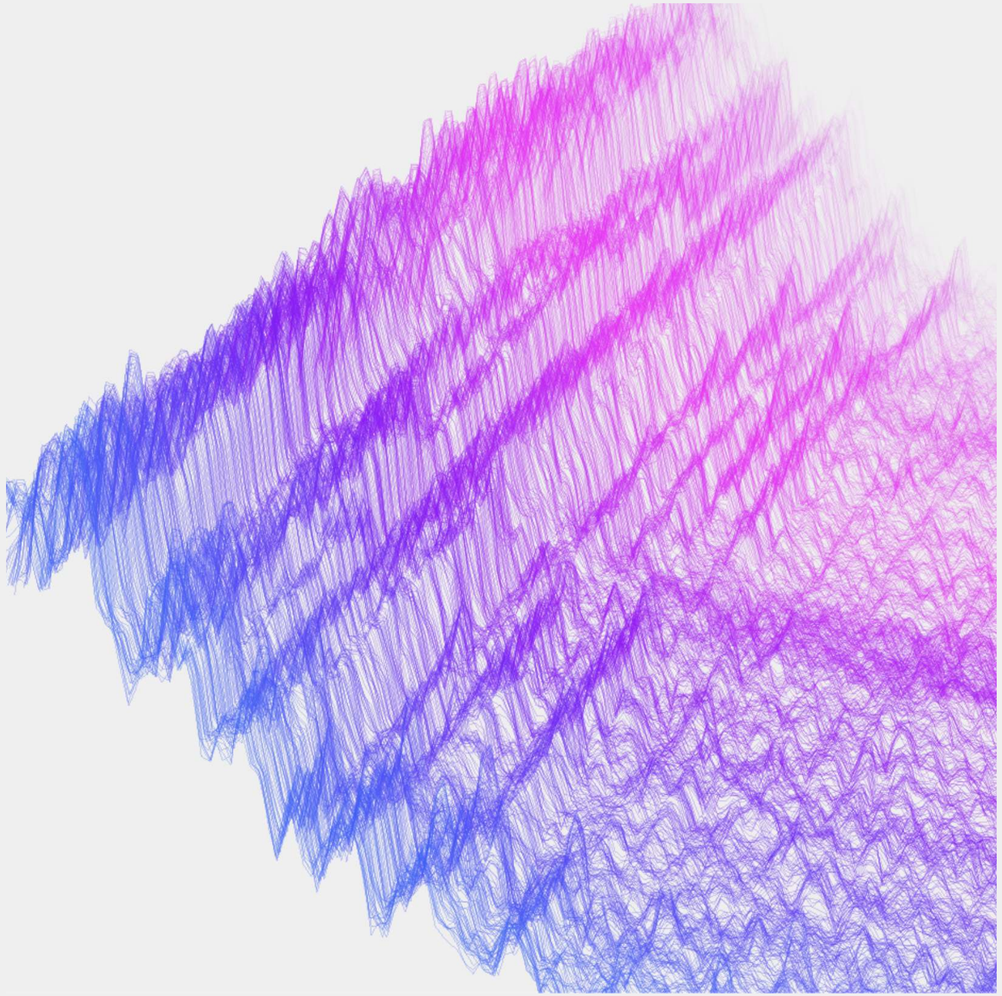
computers for play and learning



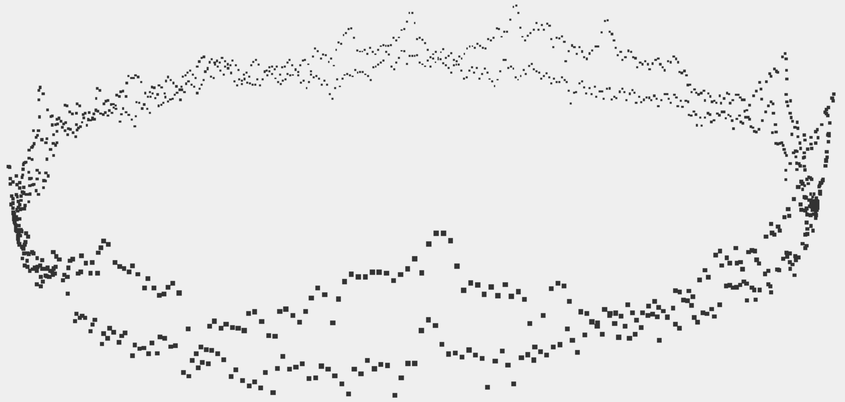


creativity and play
for kids

generative art



http://tiny.kevinandersen.dk/waves001/



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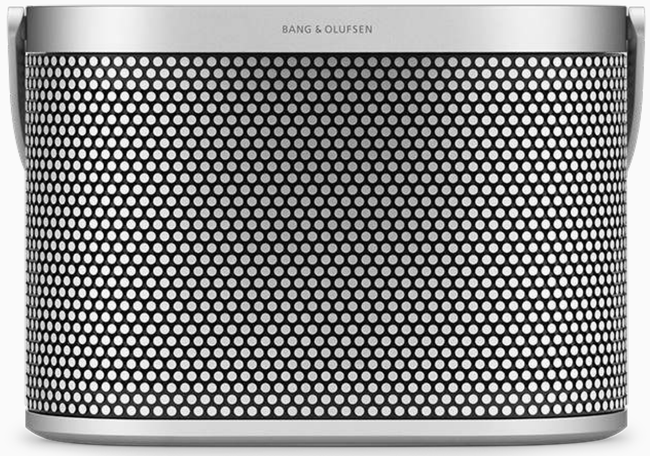
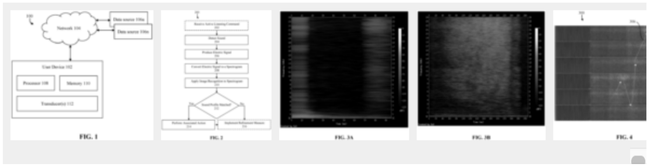


Touch-originating sound profile sensing systems and methods

Abstract

A device-agnostic system for detecting one or more sound profiles, each of the one or more sound profiles including at least one spectrogram produced from sound associated with a touch input and mapped to a control operation for a device, the system including a transducer and a processor. The transducer can detect a sound produced from touching a surface and produce an electrical signal from the detected sound. The processor is configured to receive the electrical signal from the transducer, convert the received electrical signal to a spectrogram, determine, using image recognition, that the spectrogram meets or surpasses a similarity threshold to one of the one or more sound profiles, and change at least one characteristic of the device based on the control operation mapped to the determined sound profile.

Images (5)



Classifications

G06F3/043 Digitisers, e.g. for touch screens or touch pads, characterised by the transducing means using propagating acoustic waves

View 6 more classifications

EP4345588A1
European Patent Offi

Download PDF

Other languages: Ger

Inventor: Kevin Nørby SILVANTO

Current Assignee : Ba

Worldwide applicatio

2023 • EP CN US

Application EP23200

2023-09-28 • Applic

2024-04-03 • Public

Status • Pendi

Info: Patent citations Priority and Related A

External links: Espac Discuss

sound computers


super
ultra

super ultra is a design studio based in Copenhagen
we design tools and products that extend
human ability to think and create

super
ultra

product

product discovery
interaction design
research and development
cross-functional collaboration

early-stage prototyping

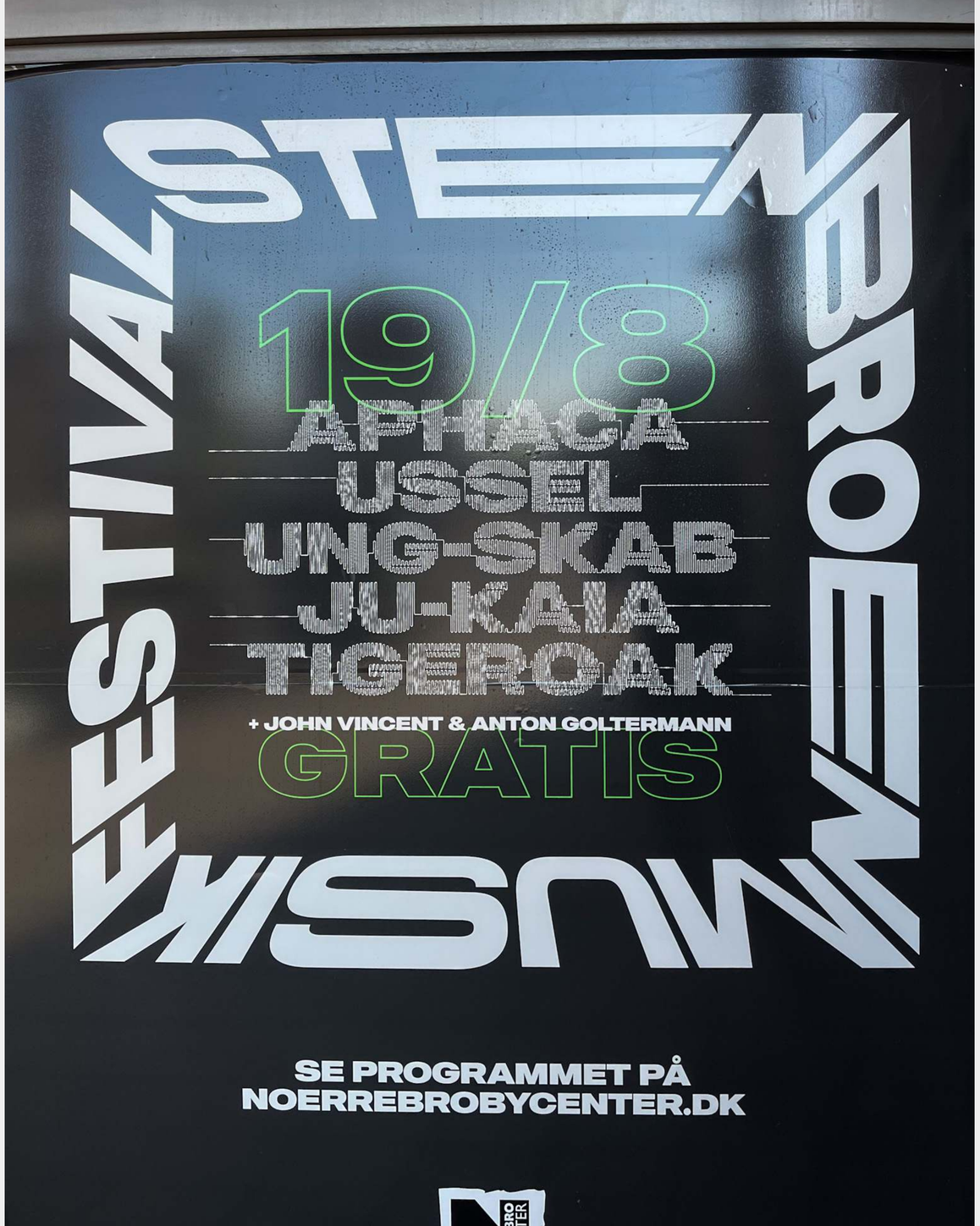
software
hardware
firmware
physical models

digital

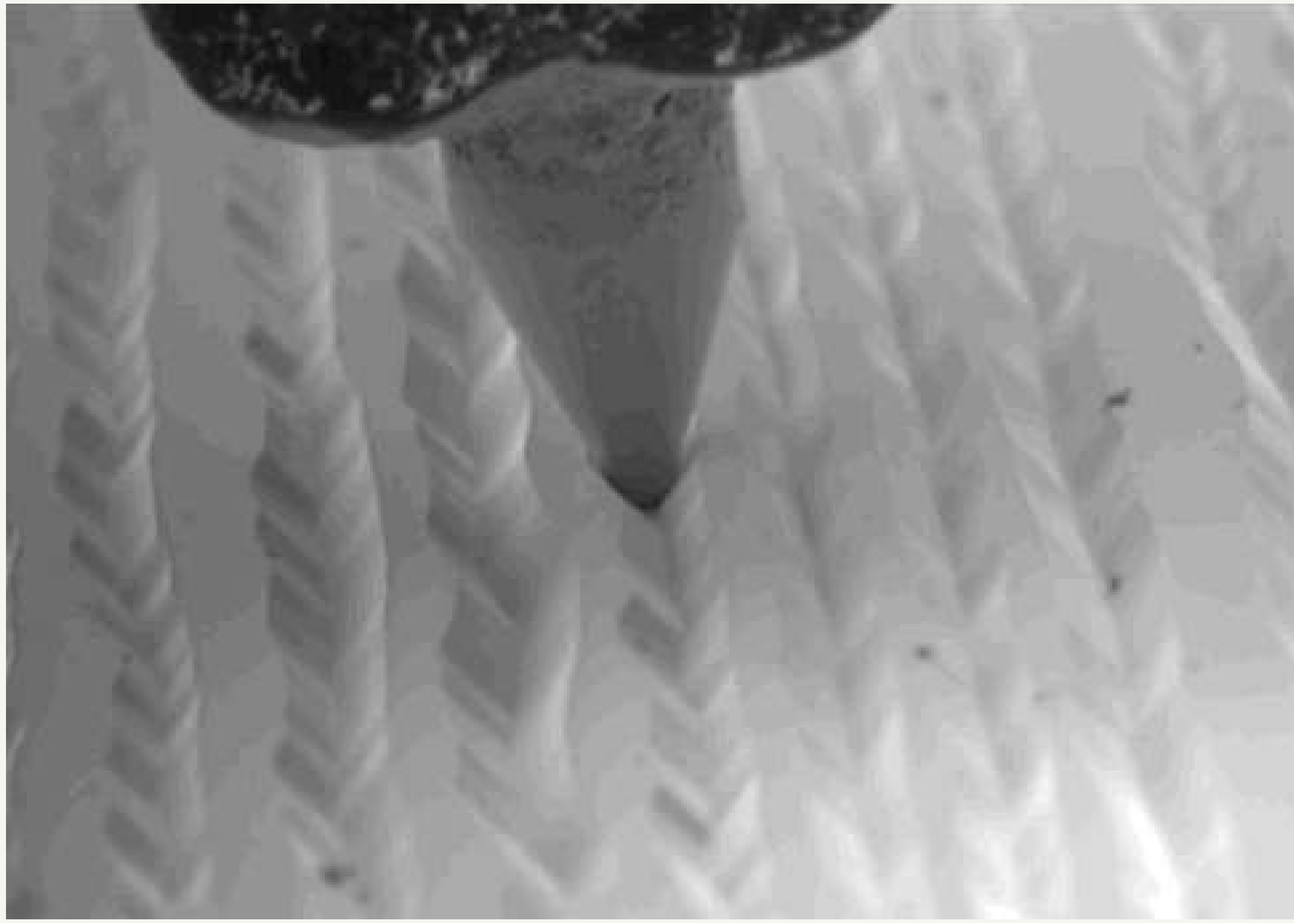
generative design
generative ai
spatial design
web development

Can we create a typeface based on sound?

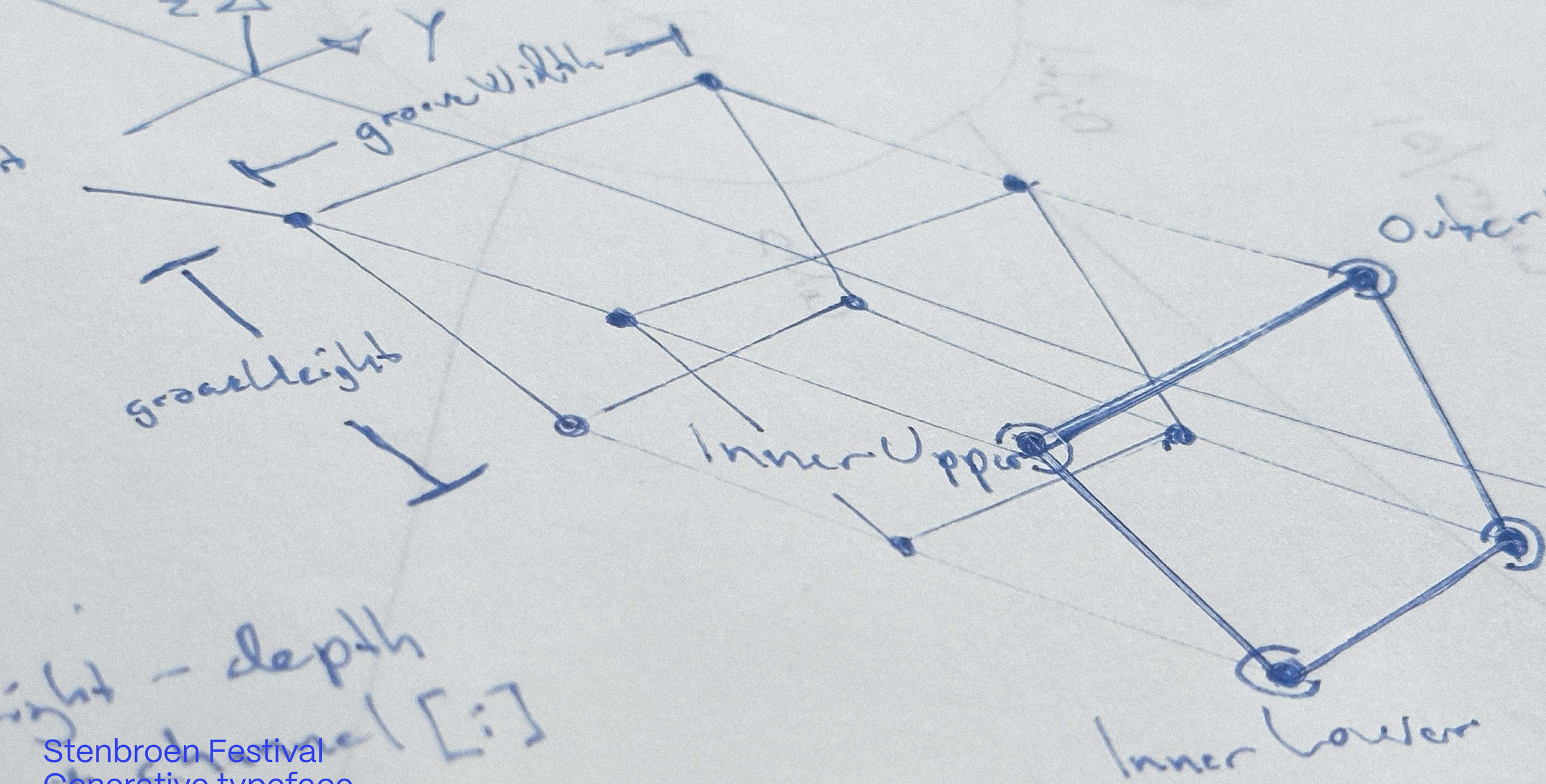
Stenbroen Festival
Generative typeface
2023



Vinyl groove study



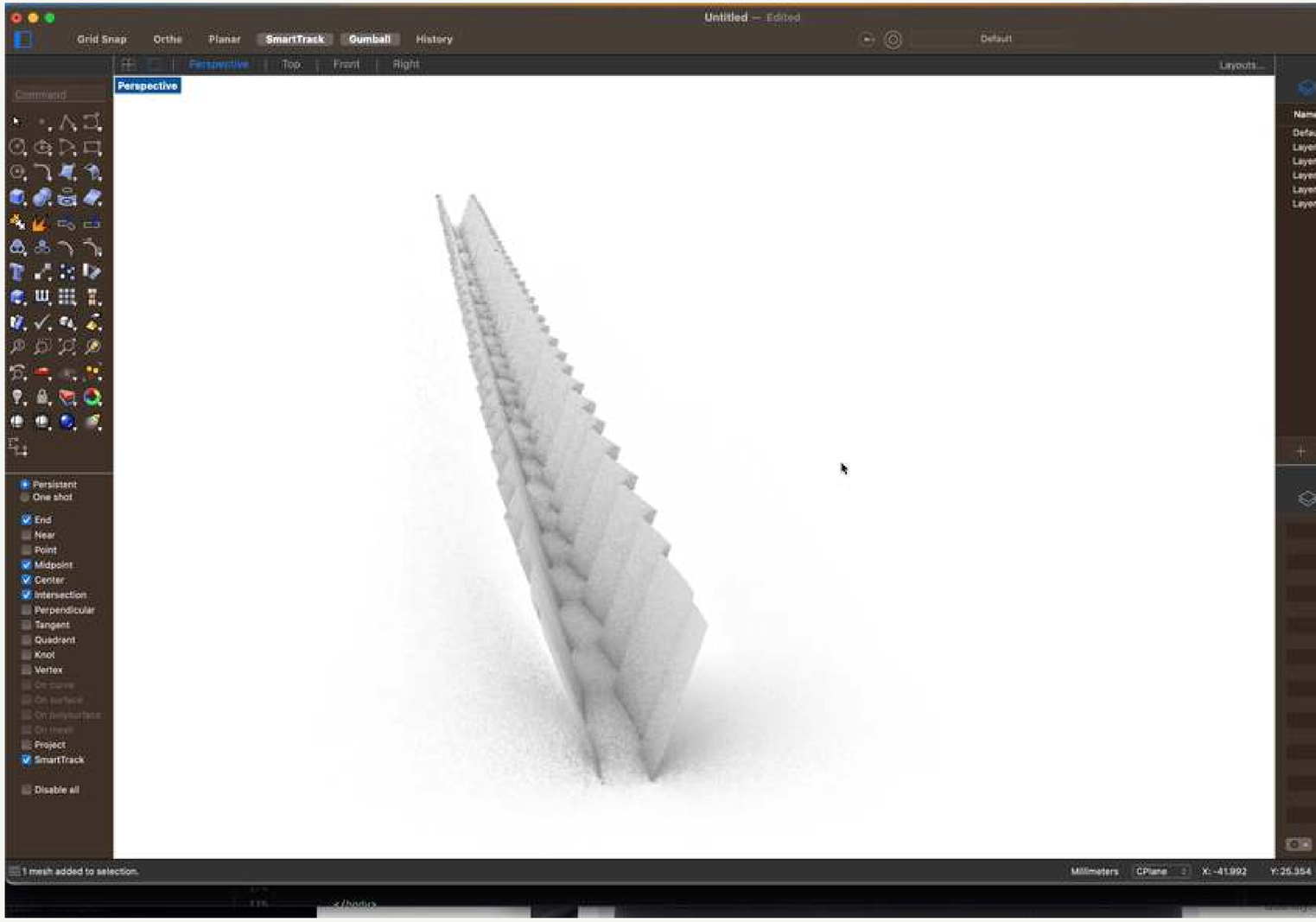
Stenbroen Festival
Generative typeface
2023



Stenbroen Festival
Generative typeface
2023

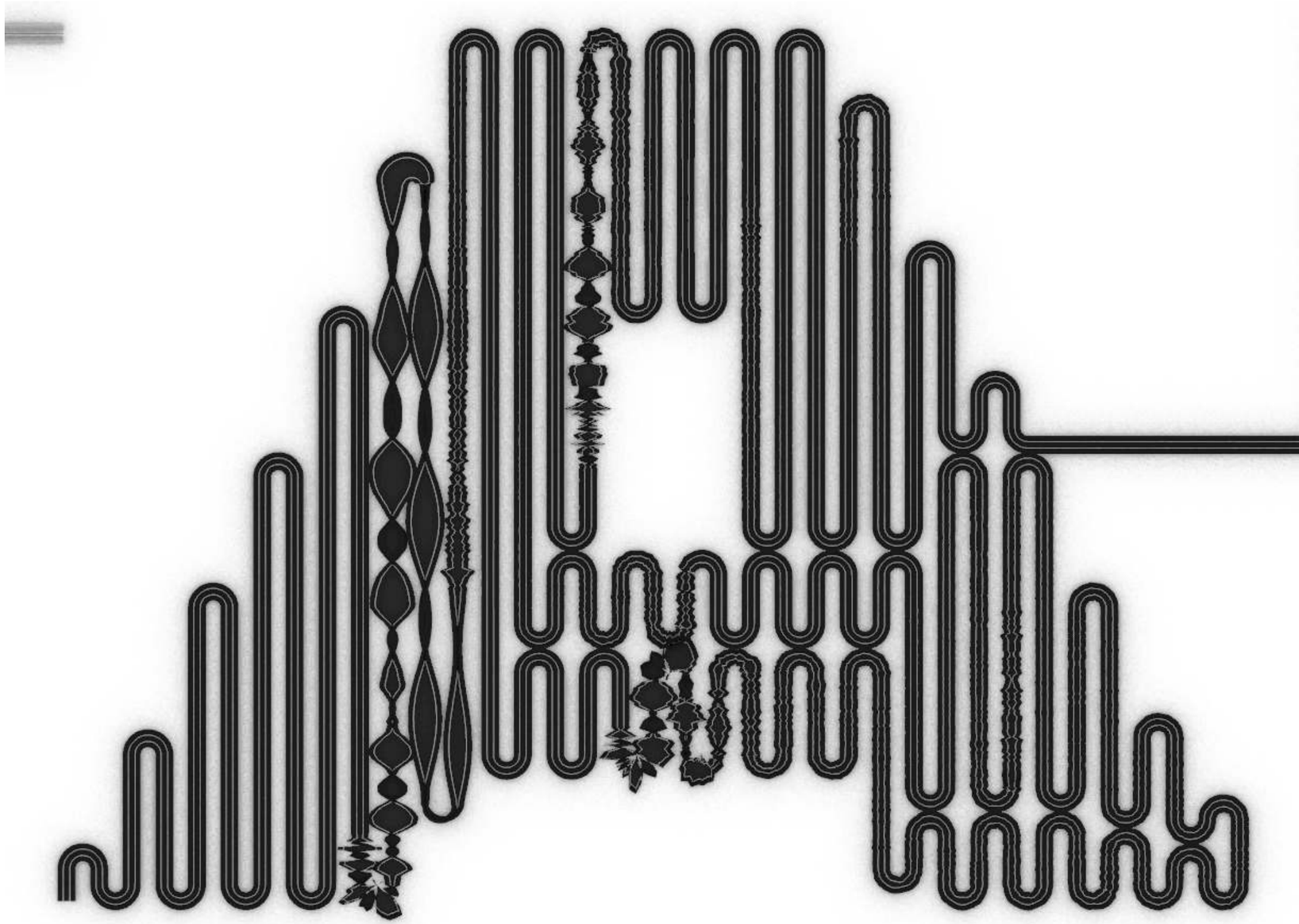
super ultra

Early sketches



Stenbroen Festival
Generative typeface
2023

Early sketches



Stenbroen Festival
Generative typeface
2023


Stenbroen Festival
Generative typeface
2023
super
ultra

Stenbroen Festival
Generative typeface
2023

Course

Course Description

The student will gain insight and practical experience with relevant theories, methods, and principles that enable innovative work in areas related to artificial intelligence. The student will identify the applications and potential of machine learning, as well as design and develop interactive solutions to explore concrete challenges in AI.

Subjects

- Artificial Intelligence and Machine Learning
- Automation and computer-assisted creativity
- Prototypes

Mixed Learning

Combine a mixture of lectures, self-directed study, group work and exercises.

Competencies

- Produce prototypes
- Work with relevant digital technologies
- Work iteratively with concept development and testing

Modules

M1 (3 days)
Teachable Machine

Image/Sound/Pose Classification with Teachable Machine

M2 (5 days)
Generative AI

Text/Image/Sound Generation with Generative AI

M3 (7 days)
Self-directed Project

Self-directed project using M1/M2

Format

Activities

Mix of talks, plenary and group exercises, and shared critiques

Main site

Use the link below to access schedule, discord invite, material and exercises.

Mornings together

Kevin will be here in the mornings but available for support sessions in the afternoon (book sessions)

https://tinyurl.com/dmjxai24

This week

	Modul 1 (21. okt - 23. okt): Introduktion og Teachable Machine			Modul 2 (24. okt - 30. okt): Generative AI	
	Man	**Tirs**	**Ons**	**Tors**	**Fre**
9 - 10	Introduktion til kursus og underviser	Opsamling/reflektioner	Opsamling/reflektioner	Præsentation og kritik	Præsentation/Opsamling/Reflektioner
10 - 11	Oplæg: Hvad er intelligens?	Opgave 2: Brug TM modeller i egne projekter (P5js/Javascript)	Opgave 3: Idegenerering til egen idé eller tegneprogram		Opgave 5: GPT API
11 - 12	Opgave 1: Introduktion til klassificering m/Teachable Machine			Oplæg: Introduktion til Generativ AI, ChatGPT og prompting	
12 - 13	Frokost	Frokost	Frokost	Frokost	Frokost
13 - 14	Fortsættelse af Opgave 1 (image + sound + pose)	Ingen undervisning	Opgave 3: Udvikling	Opgave 4: ChatGPT	Oplæg: super ultra eksperimenter med Generative AI (tilbud)
14 - 15					
15 - 16					

Principles

This course is for you

If something doesn't work, please tell me. I want this to be great for you.

I am here for you

I have worked with code as a material for 30 years and worked with some of the biggest brands and talented teams in the world – ask me anything!

Be demanding

If you want a deep dive in a subject / technology / product / prototype, just ask.

"1000 Words of Advice to Design Students"
https://www.core77.com/posts/40428/1000-Words-of-Advice-to-Design-Students

How we work

Collective brain

Use our collective intelligence. Share learnings, work, questions and frustrations

Groups

Work in groups. Groups persist for one or more modules.

Responsibility

It is your responsibility to be able to do and share the work. Find ways or ask how.

Sharing

Upload code to a repository, record a video, share a deck, etc.

Materials

OpenAI

ChatGPT Plus subscription ($20)
OpenAI API Credits (free+)

Stable Assistant

TBD

P5js Account

Hopefully you already have this, but fortunately it’s free.

That’s it

Questions? Comments? Thoughts?

Talk:
“Intelligence”

What is intelligence?

What makes something or someone intelligent? What's the threshold?
Who and what is intelligent?

Intelligence

Analytical

The capacity to solve problems and analyze information logically

Learning

The ability to acquire new knowledge and skills, and apply them in novel contexts.

Adaptable

The ability to adjust thinking and behavior to meet changing demands or environments.

Creativity

The ability to think in novel ways and generate innovative solutions or ideas.

Emotional

Recognize, understand, and manage one's own emotions and those of others.

But the definition of intelligence is ultimately a philosophical and changing matter...

Intelligence in computing

17th century

Leibniz develops binary number system and thinks entire universe can be understood this way.

Descartes defines mind–body dualism, separating the mind from the body.

1950s-1960s

Birth of "Artificial Intelligence". Machines that could simulate human intelligence / Symbolic AI

1980s

Expert systems, use of AI in banking, medical and manufacturing, but struggled with broader tasks.

1990s-2010s

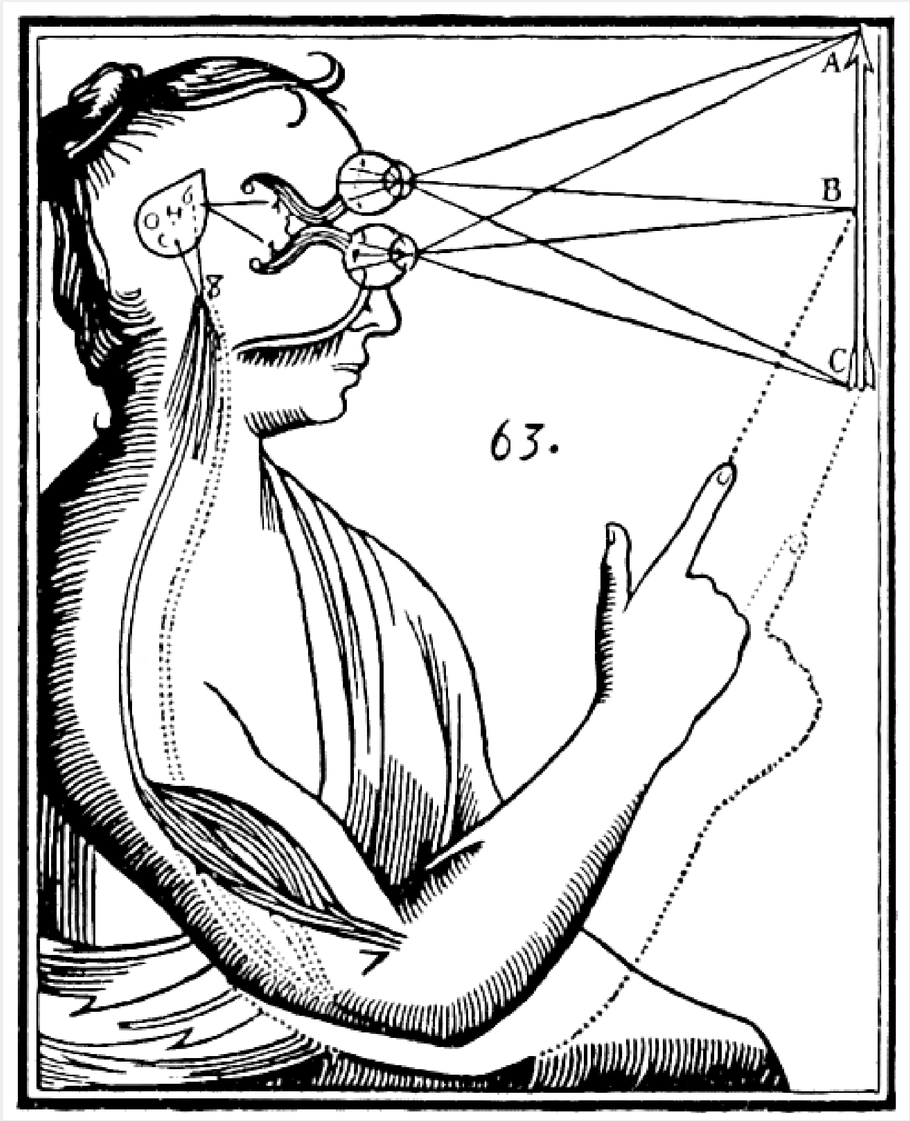
Rise of Machine Learning, shift from programming and rules to data and patterns.

2022+

Generative AI

Descartes (1641)

Cartesian dualism, most famously defended by René Descartes, argues that there are two kinds of substances: mental and physical.[8][16] Descartes states that the mental can exist outside of the body, and the body cannot think.
https://en.wikipedia.org/wiki/Mind–body_dualism



Turing (1950)

The Turing test, originally called the imitation game by Alan Turing in 1949,[2] is a test of a machine's ability to exhibit intelligent behaviour equivalent to, or indistinguishable from, that of a human.

https://en.wikipedia.org/wiki/Turing_test

VOL. LIX. No. 236.] [October, 1950

MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY

I.—COMPUTING MACHINERY AND INTELLIGENCE

BY A. M. TURING

1. *The Imitation Game.*

I PROPOSE to consider the question, 'Can machines think?' This should begin with definitions of the meaning of the terms 'machine' and 'think'. The definitions might be framed so as to reflect so far as possible the normal use of the words, but this attitude is dangerous. If the meaning of the words 'machine' and 'think' are to be found by examining how they are commonly used it is difficult to escape the conclusion that the meaning and the answer to the question, 'Can machines think?' is to be sought in a statistical survey such as a Gallup poll. But this is absurd. Instead of attempting such a definition I shall replace the

ELIZA (1964–67)

ELIZA is an early natural language processing computer program developed from 1964 to 1967[1] at MIT by Joseph Weizenbaum.[2][3] Created to explore communication between humans and machines, ELIZA simulated conversation by using a pattern matching and substitution methodology that gave users an illusion of understanding on the part of the program, but had no representation that could be considered really understanding what was being said by either party.

"I had not realized ... that extremely short exposures to a relatively simple computer program could induce powerful delusional thinking in quite normal people."
– Joseph Weizenbaum

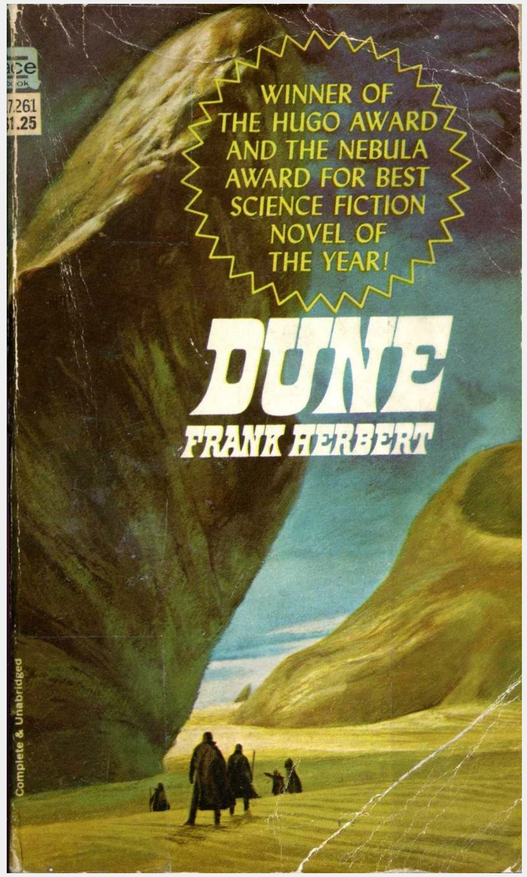
Anthromorphism

OG ChatBot

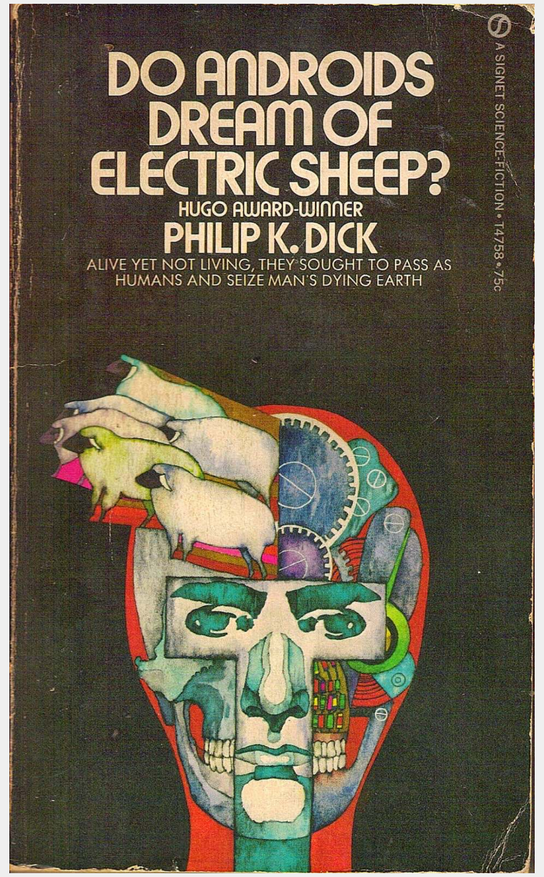
https://en.wikipedia.org/wiki/ELIZA

Cultural Response

A couple of notable responses to the notion of robot intelligence



1965



1968

Its technology is how a society copes with physical reality: how people get and keep and cook food, how they clothe themselves, what their power sources are (animal? human? water? wind? electricity? other?) what they build with and what they build, their medicine — and so on and on. Perhaps very ethereal people aren't interested in these mundane, bodily matters, but I'm fascinated by them, and I think most of my readers are too.

Technology is the active human interface with the material world.

– Ursula K. Le Guin

https://www.ursulakleguin.com/a-rant-about-technology

Intelligence in computing

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Leibniz develops binary number system and thinks entire universe can be understood this way.

Descartes defines mind–body dualism, separating the mind from the body.

Symbolic AI

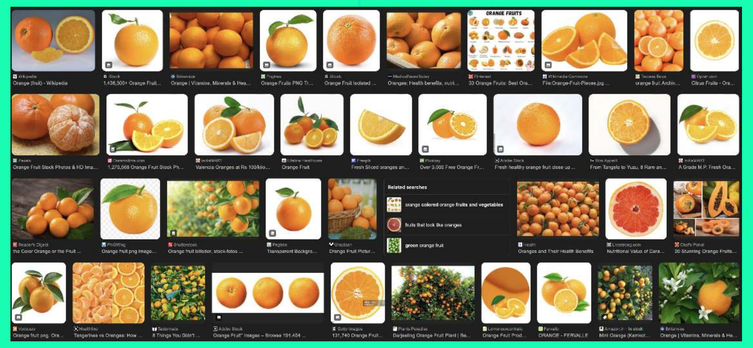
Orange fruit:

- Has orange color
- Has bumpy skin
- Has soft, fleshy inside
- Has green bump

Programming
Rules

Machine Learning

Orange fruit:

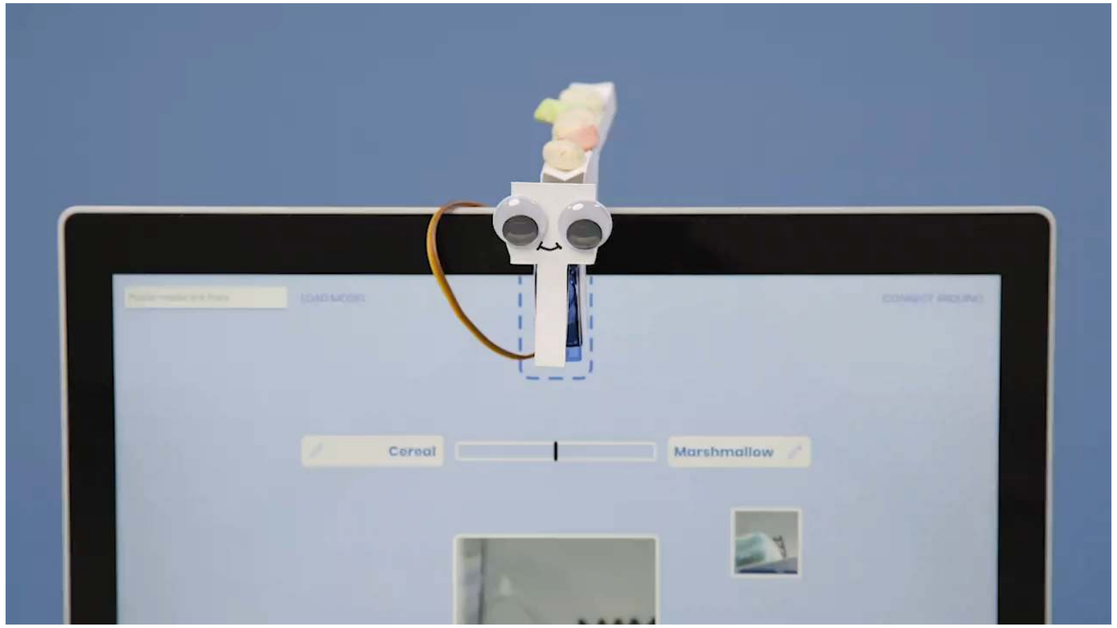


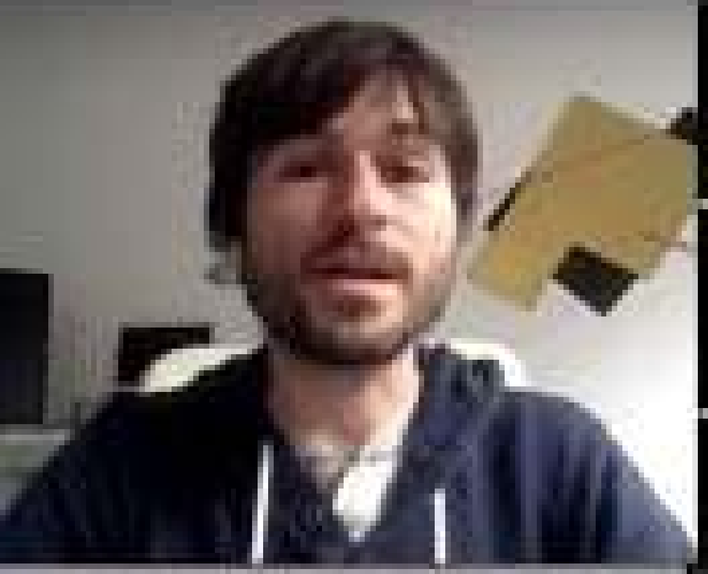
Training
Data

Machine Learning Era

From programming rules to data and training

In the Machine Learning era, instead of explicitly programming rules, like what makes a marshmallow a marshmallow, a classification model is trained based on images of marshmallows.





Conv Features

Conv 0

LOCAL_RESPONSE_NORM_0

MAX_POOL_0

CONV_1

LOCAL_RESPONSE_NORM_1

MAX_POOL_1

CONV_2

CONV_3

CONV_4

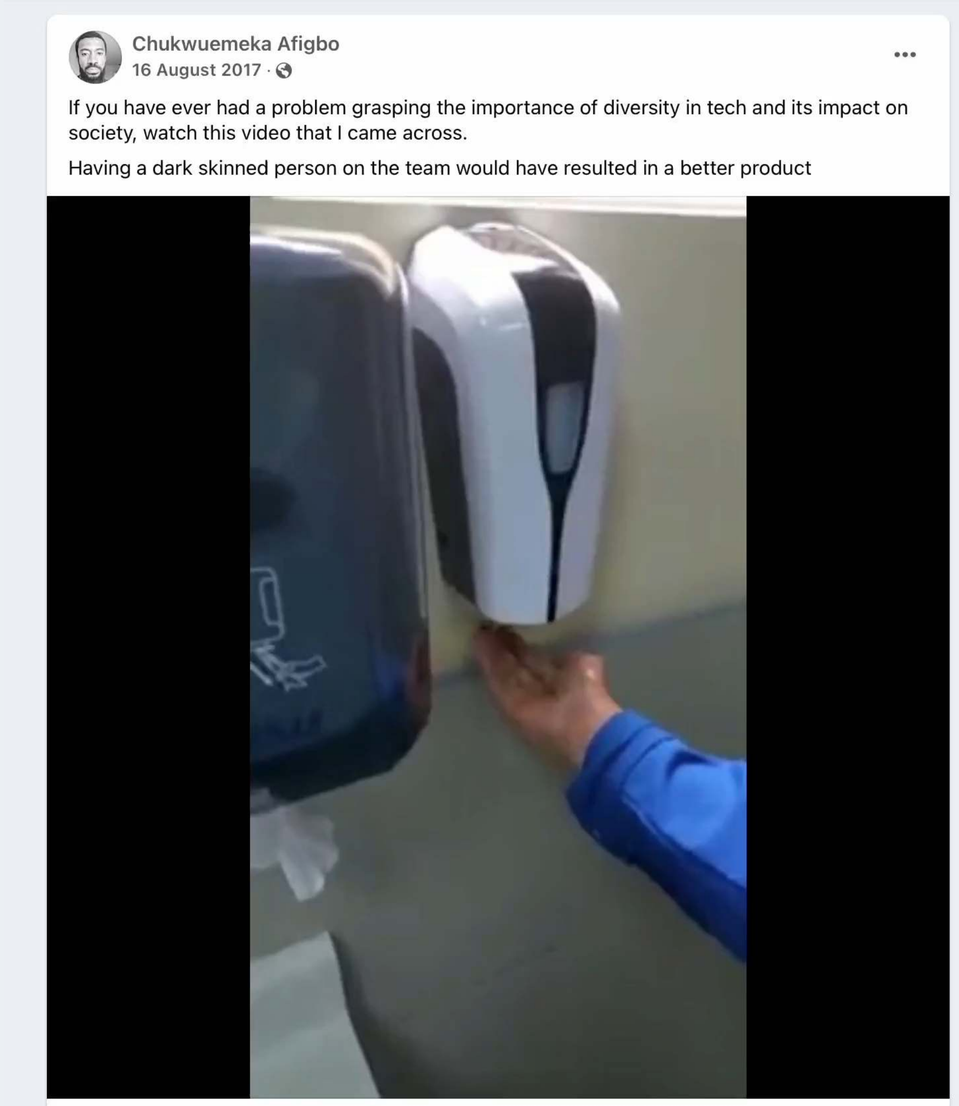
MAX_POOL_2

FC_0

FC_1

Without rules, a model is only as good as its data

AI/ML becomes a mirror of our society and organizations




WE'RE TRAINING AI ON
REAL-WORLD DATA, SO IT'LL BE
COMPLETELY NEUTRAL AND UNBIASED.
THE DATA WILL MAKE IT
FAIR AND OBJECTIVE, RIGHT?
RIGHT?
imgflip.com

AlphaGo (2016)

AlphaGo is a computer program that uses a machine learning algorithm to find its next moves based on previous knowledge from computer and human play.

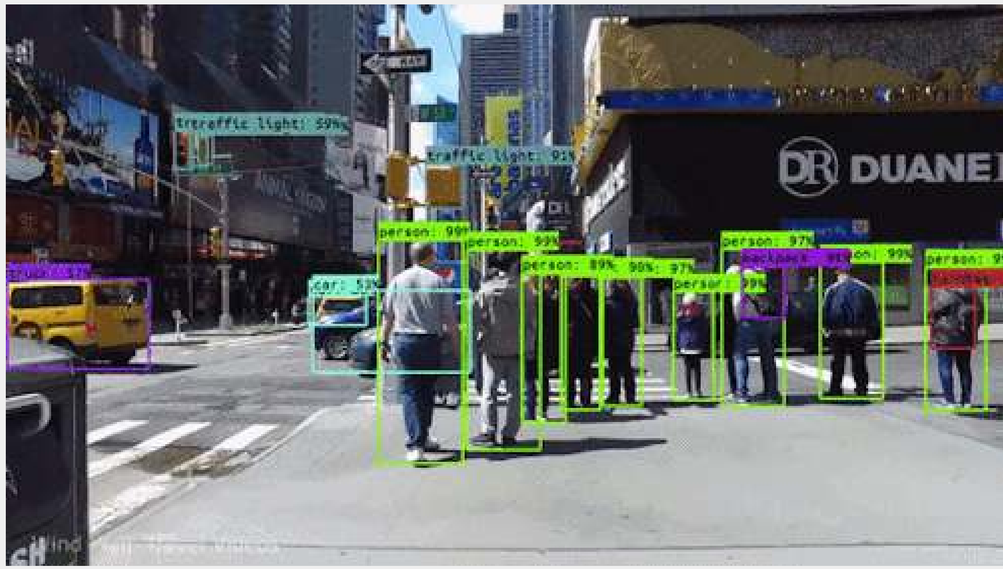
AlphaGo became the first computer program to beat a human professional Go player without handicap on a full-sized board.

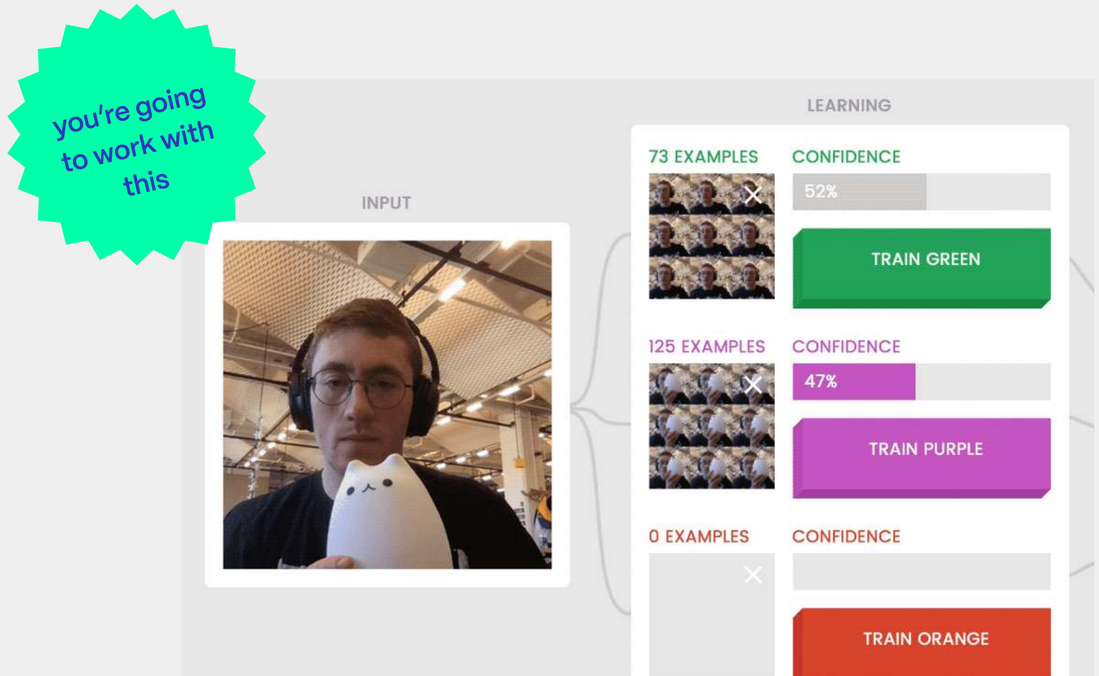
The key difference between this new era of AI compared to the previous Symbolic AI, is that no one told AlphaGo “how to play” Go, it learned by playing.

https://en.wikipedia.org/wiki/AlphaGo

AI/ML becomes cheap/fast (2010s)

Machine Learning and Deep Learning algorithms can now be run on consumer hardware like laptops, phones and even smaller embedded microcontrollers.





Touch-originating sound profile sensing systems and methods

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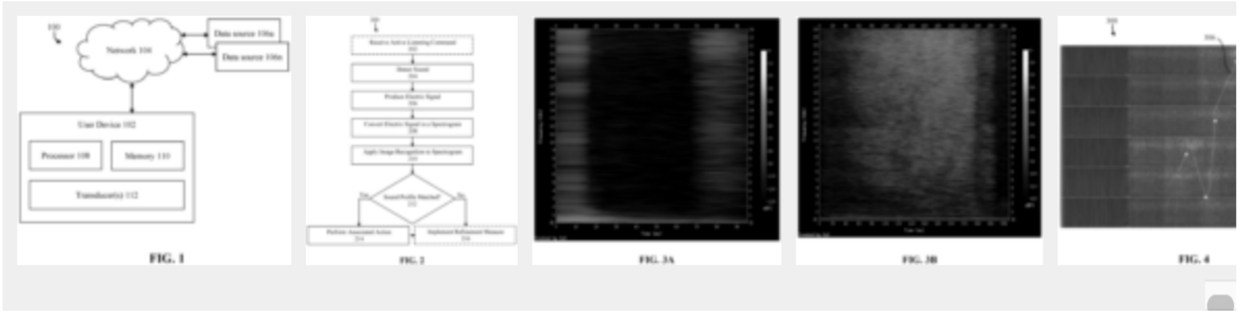

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View 6 more classifications

EP4345588A1

European Patent Office

Download PDF | Find Prior Art | Similar

Other languages: German, French

Inventor: Kevin Nørby ANDERSEN, Pablo Martinez-Nuevo, Miklu SILVANTO

Current Assignee : Bang and Olufsen AS

Worldwide applications

2023 • EP CN US

Application EP23200535.5A events

2023-09-28 • Application filed by Bang and Olufsen AS

2024-04-03 • Publication of EP4345588A1

Status • Pending

Info: Patent citations (3), Legal events, Similar Priority and Related Applications

External links: Espacenet, EPO GPI, EP Register, G Discuss

same technique, using image classification on sound samples

Wrap up

How to think about it all

Technology is not inherently good or bad, it is how we use it, the humans behind it, that can be good or bad.

What we will work with and why

Teachable Machine

An easy and fun way to use machine learning as an input mechanism

Generative AI (later this week)

We will explore using generative AI in the context of Coded Design, and how to use these technologies as both tools and materials

Rest of module

After the upcoming break, start on Exercise 1.

Tuesday morning (tomorrow)
We meet for reflections, troubleshooting, (maybe a quick demo?), and get started with Exercise 2

Tuesday afternoon
No activities, as Karsten told me you had another thing to attend.

Wednesday
We meet again to discuss/demo/reflect and work on Exercise 3.

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	Man	**Tirs**	**Ons**
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12 - 13	Frokost	Frokost	Frokost
13 - 14	Fortsættelse af Opgave 1 (image + sound + pose)	Ingen undervisning	Opgave 3: Udvikling
14 - 15			
15 - 16			

Module 2: Generative AI

These are my ideas for subjects for Module 2, but I am open for input.

Are there topics you are very interested in?

(Chat)GPT

Learn to use ChatGPT to accomplish various tasks and work with the GPT API directly

Assistants

Learn how to use specific materials like books and documents to create specific GPT Assistants

Image Generation

Learn how to generate and manipulate bitmap images

Speech Generation?

Learn how to turn text into speech

That’s it

Questions? Comments? Thoughts?

Next up:
Exercise 1

Teachable Machine

User interface developed by Google, that makes it easy to train simple image/audio/pose classification machine learning models

Exercise 1

Learn how to use Teachable Machine to train your first classification models

Go to the course site and find the first exercise.

Feel free to work wherever you want, but Kevin will be here for support and make sure everyone gets started.

https://tinyurl.com/dmjxai24