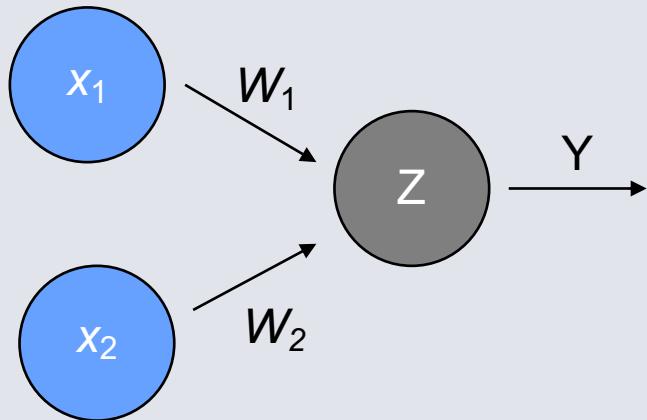


Magical World of GANs

Krishna Balaga
Developer Advocate

Where it all Started

The Inception!

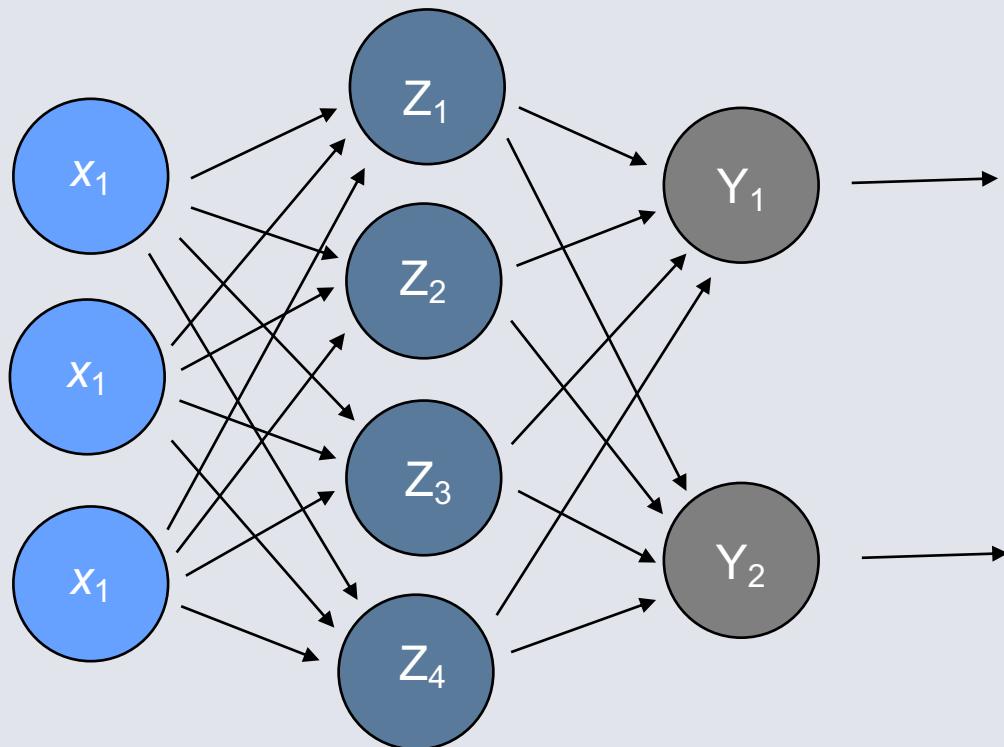


A detailed diagram showing the mathematical calculation of a perceptron's output. The output is labeled "Output". Above it, "Weighted Sum" is shown as a downward arrow pointing to the equation. Below the equation, "Activation" is shown as an upward arrow pointing back to the "Weighted Sum" label. The equation itself is:

$$Y = g \left(\sum_{i=0}^n x_i W_i \right)$$

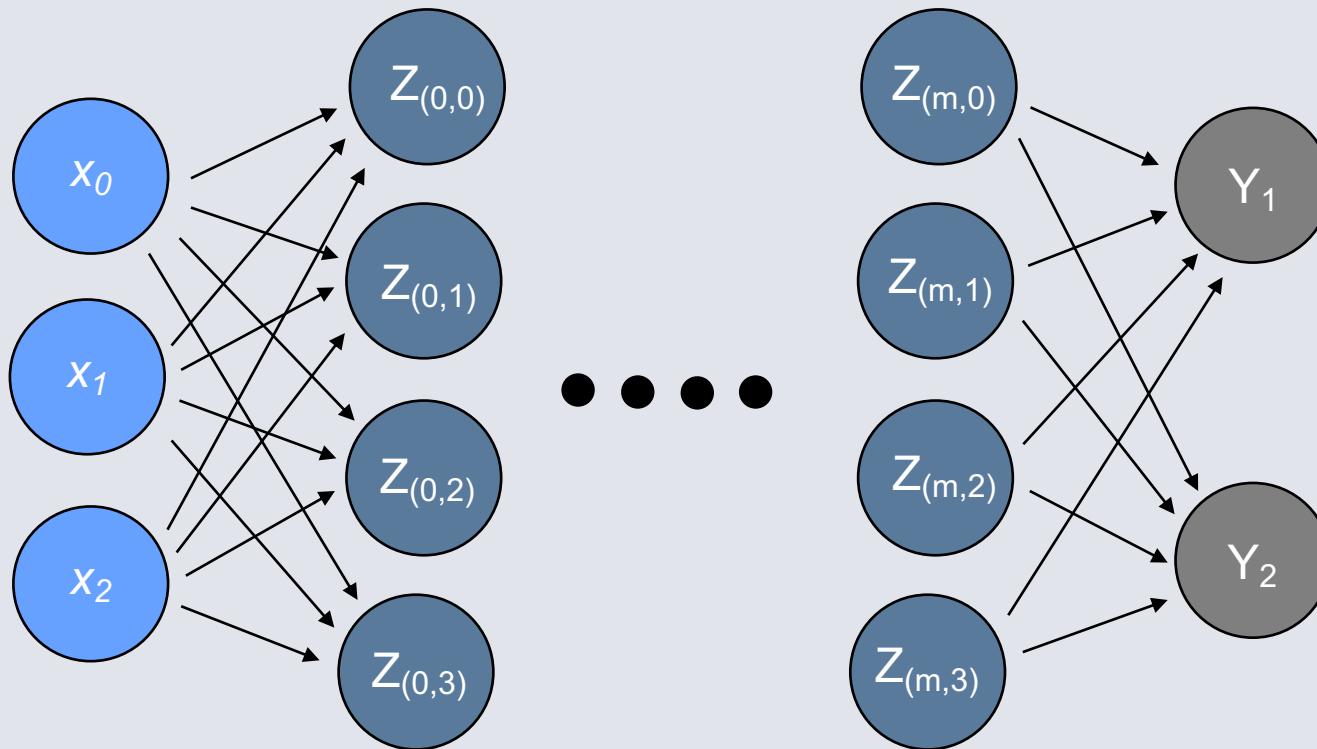
Building a simple perceptron

The Inception!



Assembling a Neural Net

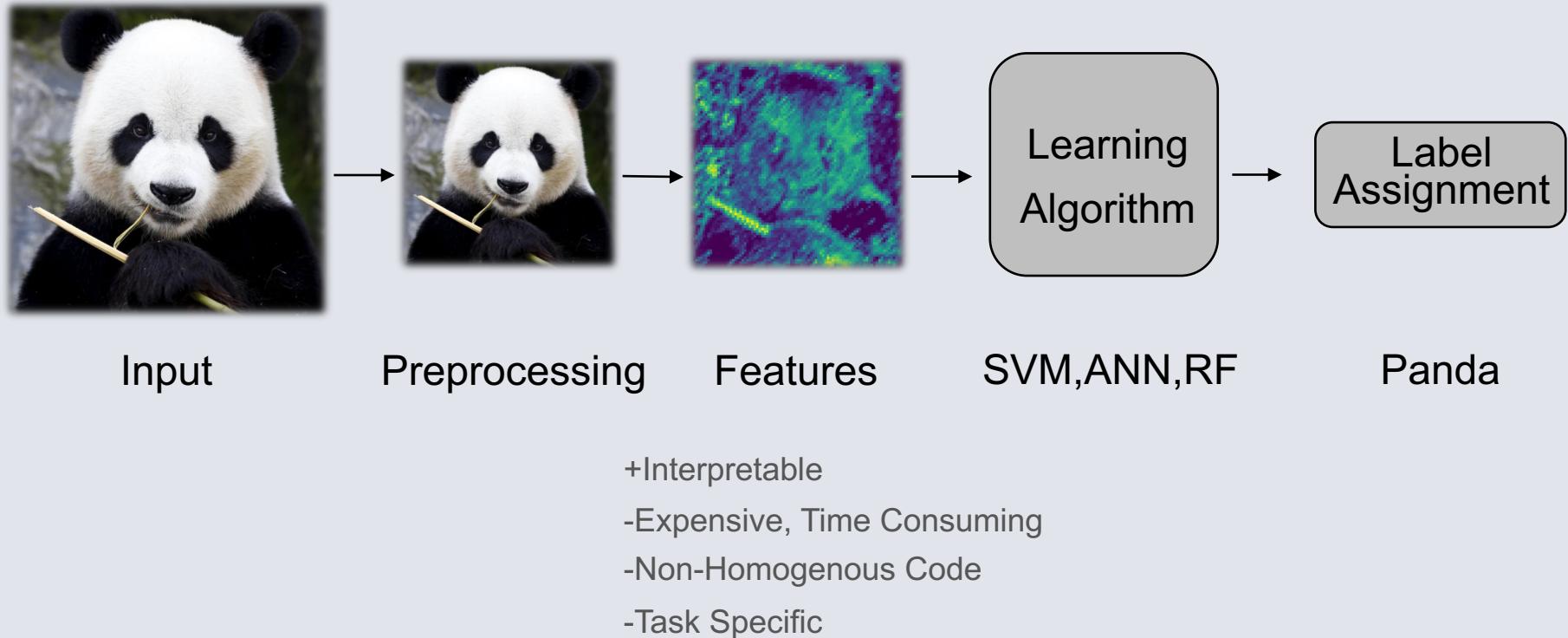
The Inception!



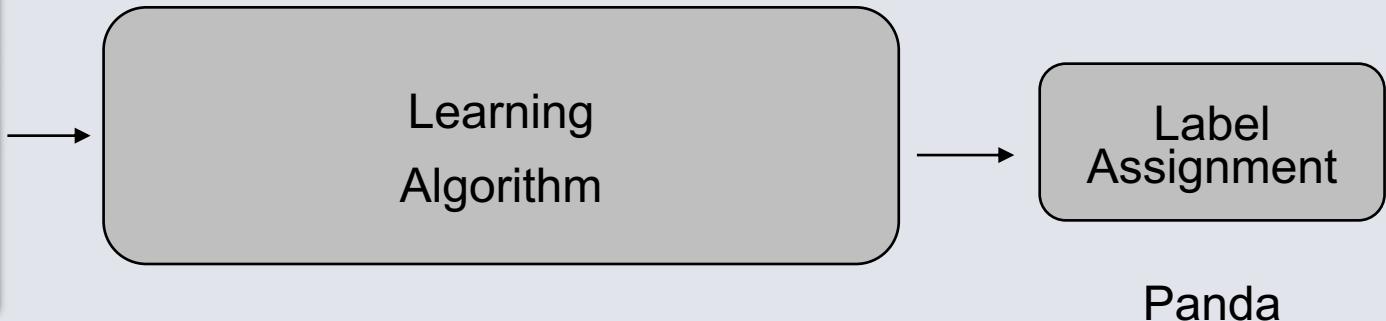
Making a Deep Neural Networks

How are they Different?

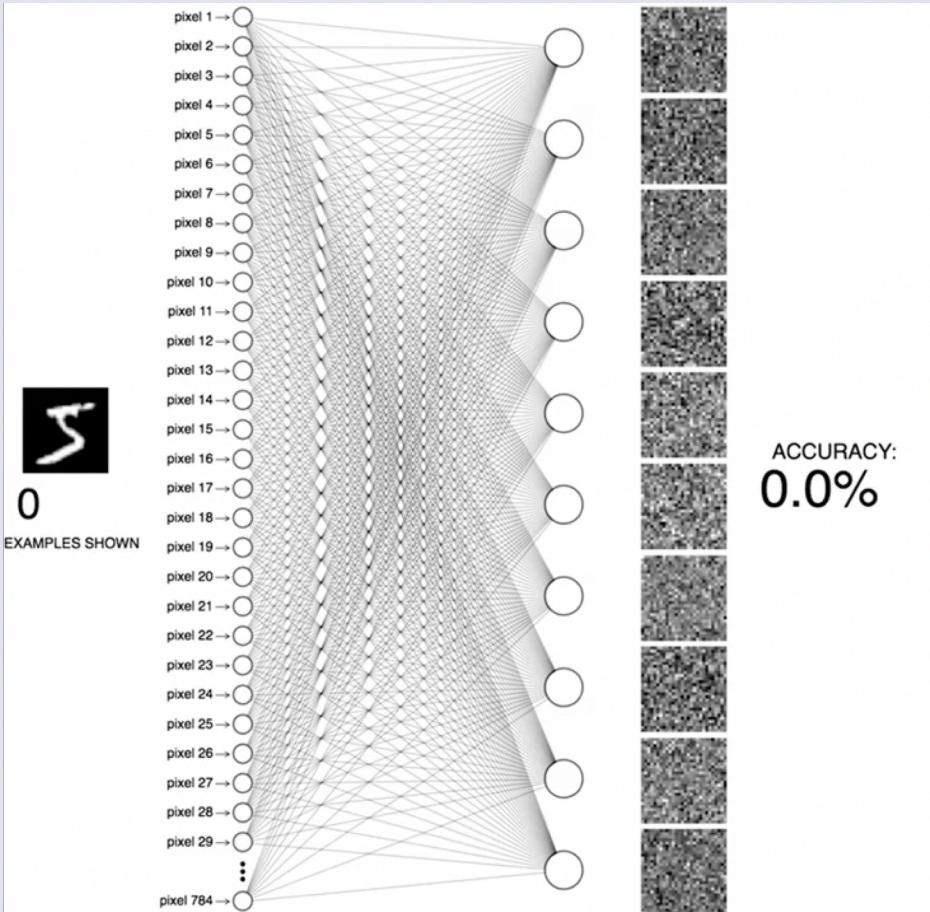
Computer vision before Deep Learning



Computer vision with Deep Learning



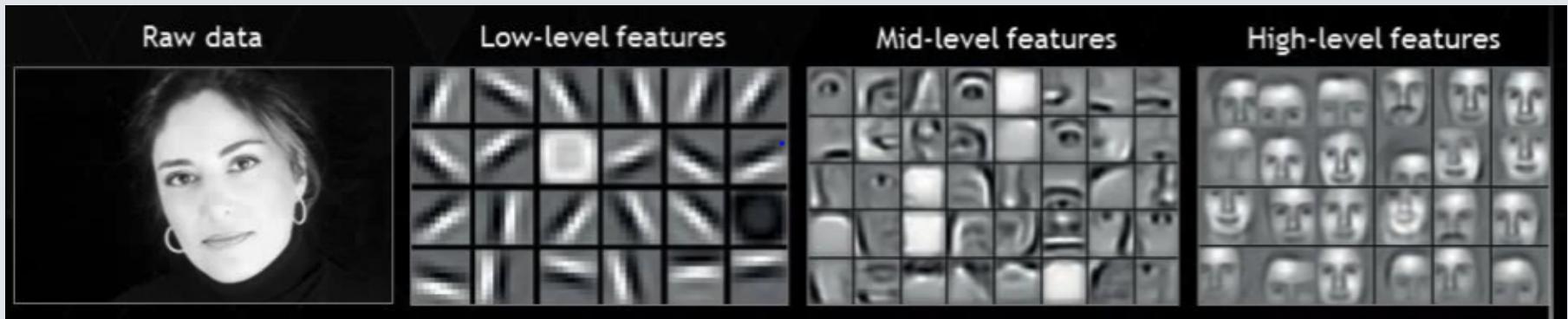
- +Trained End to End
- +Scalable, homogenous code
- +Generalizes well
- Resource and Data Intensive



During training, the network starts finding out a good set of weights for the entire network that maps the input with output

Essentially,

With Deep learning, it is possible to learn the
underlying features directly from data



UseCases

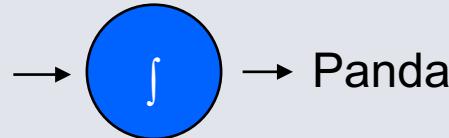


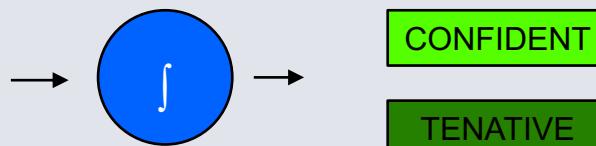
Image Classification

Food and water ran out four days ago.

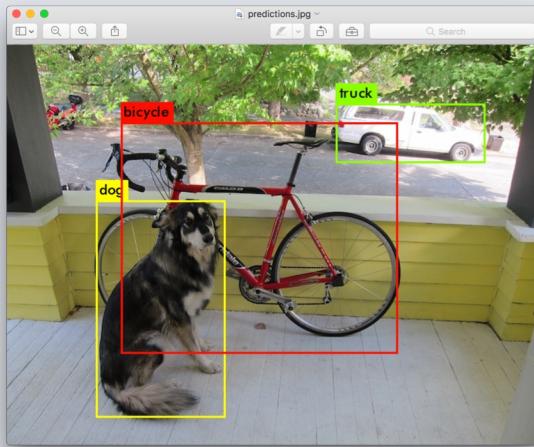
Oxygen will run out tomorrow morning.

When I drift off, I will dream about you.

It's always you

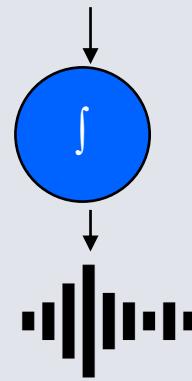


sentiment analysis

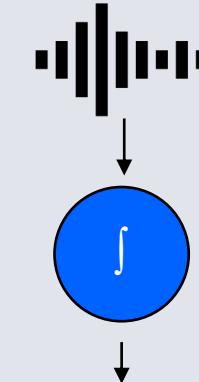


Object detection

Hello there!



Text to speech

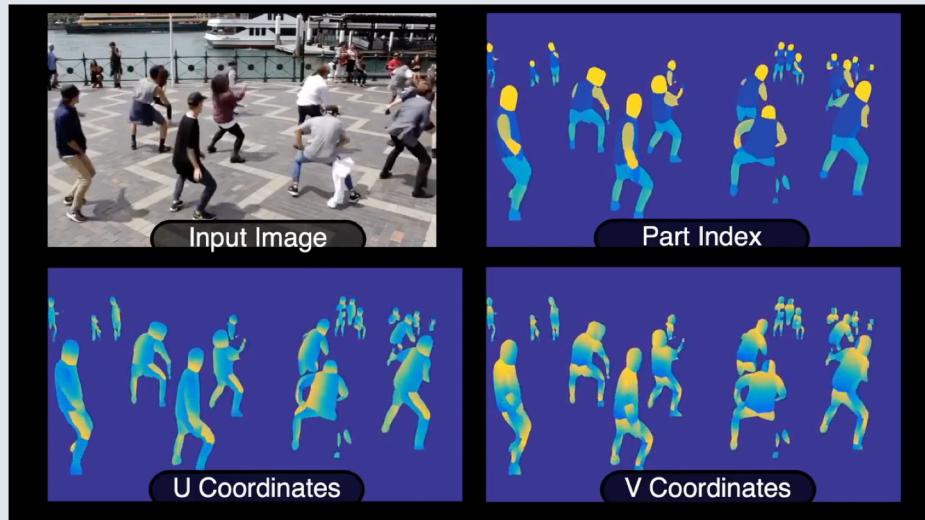


hope you are
having fun

Speech to text



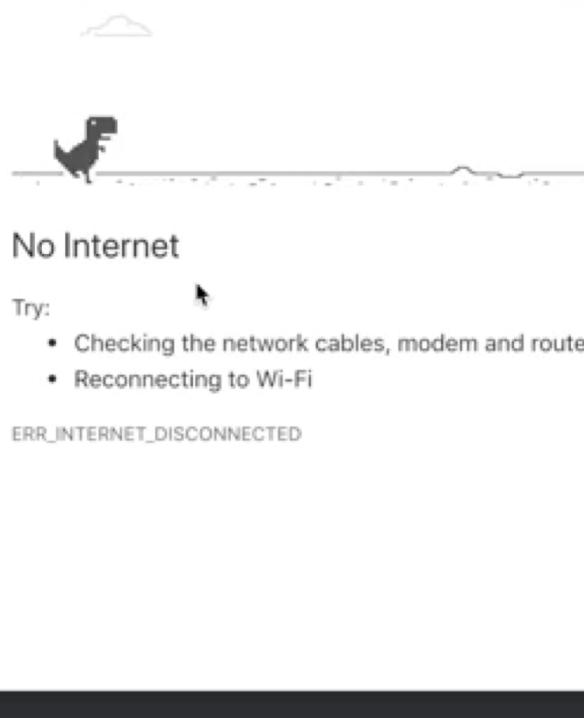
Markerless full body pose estimation



Dense Pose



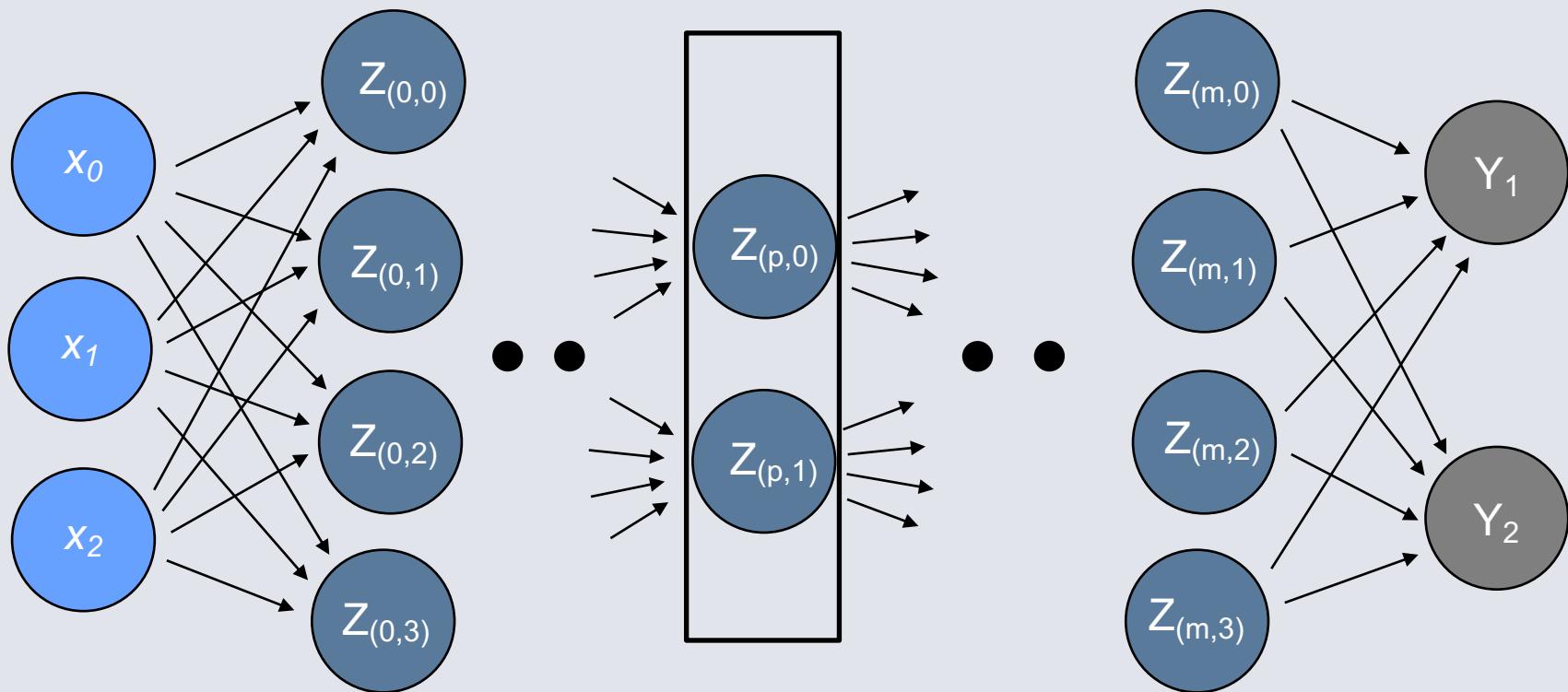
Semantic Segmentation



FACIAL LANDMARKING

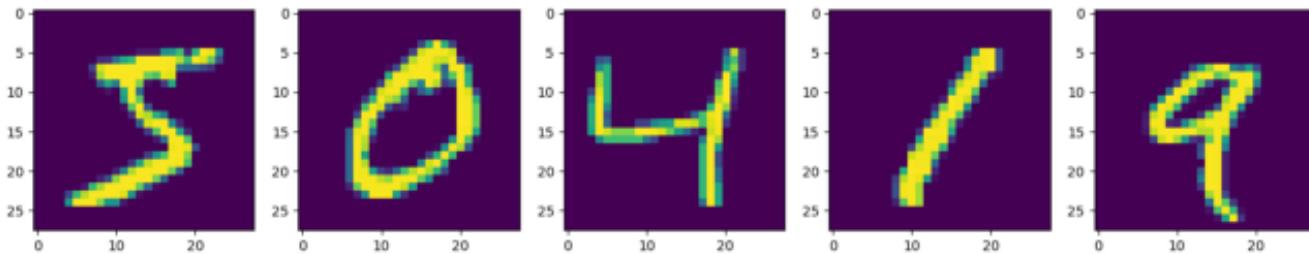
Auto Encoders

The Bottle Neck!

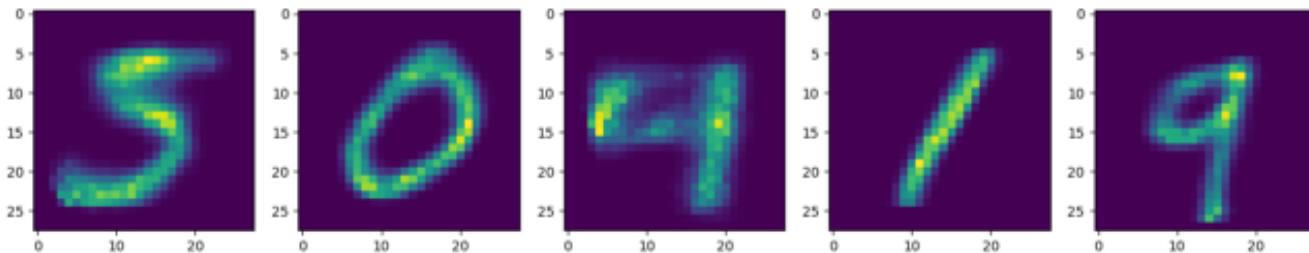


Making a Deep Neural Networks

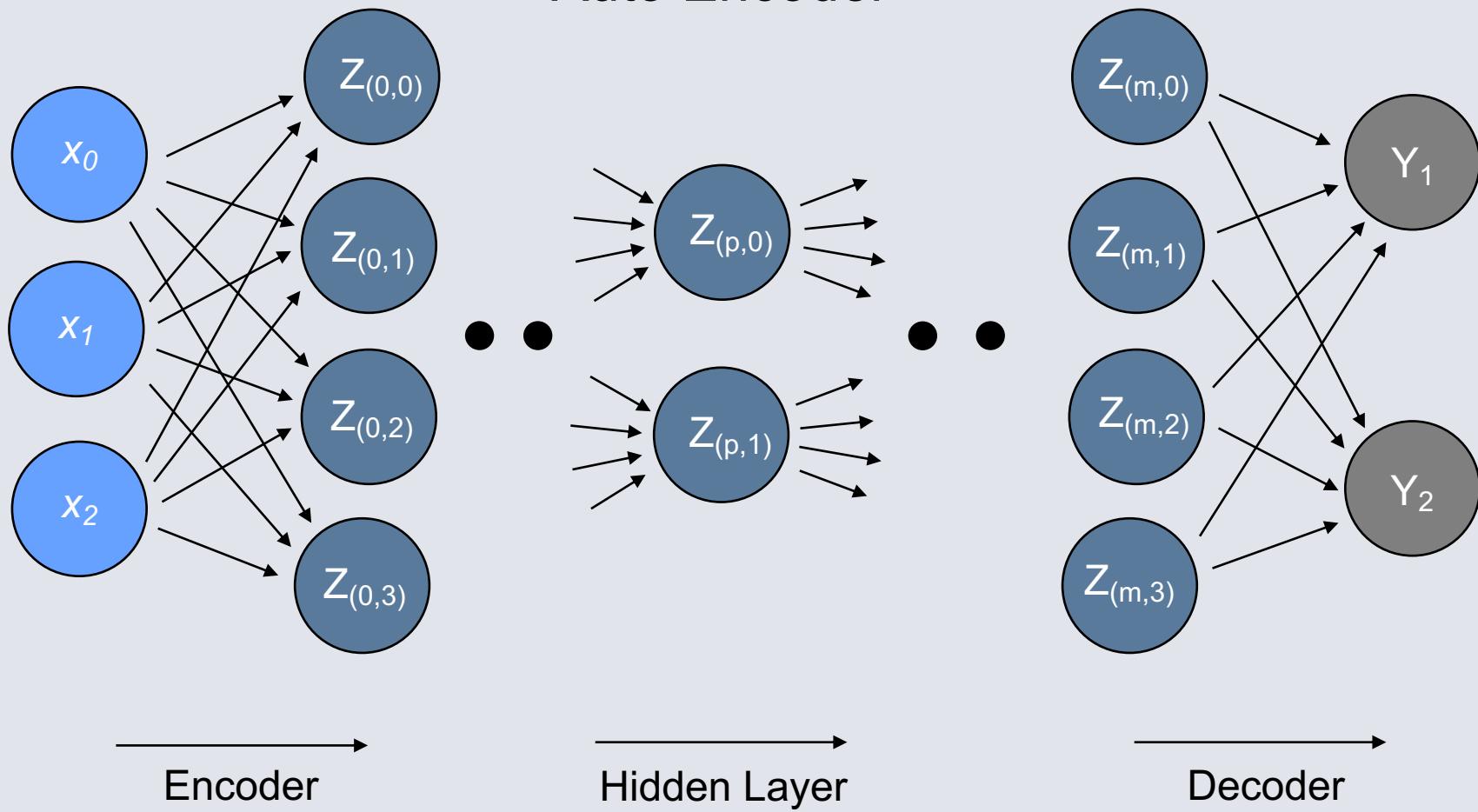
Input



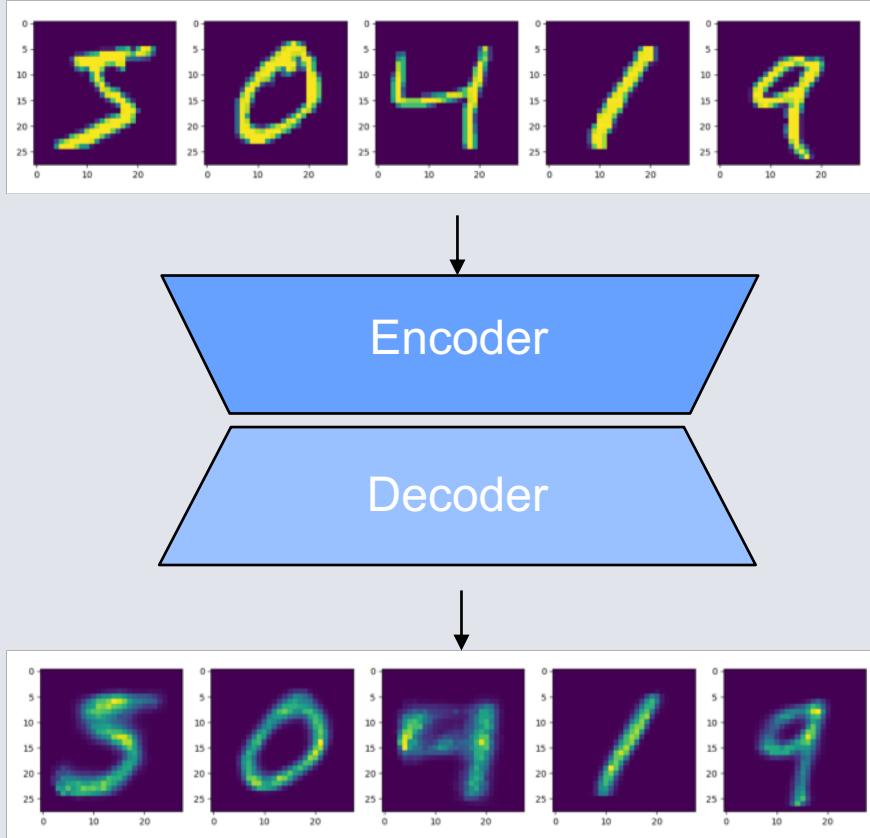
Output



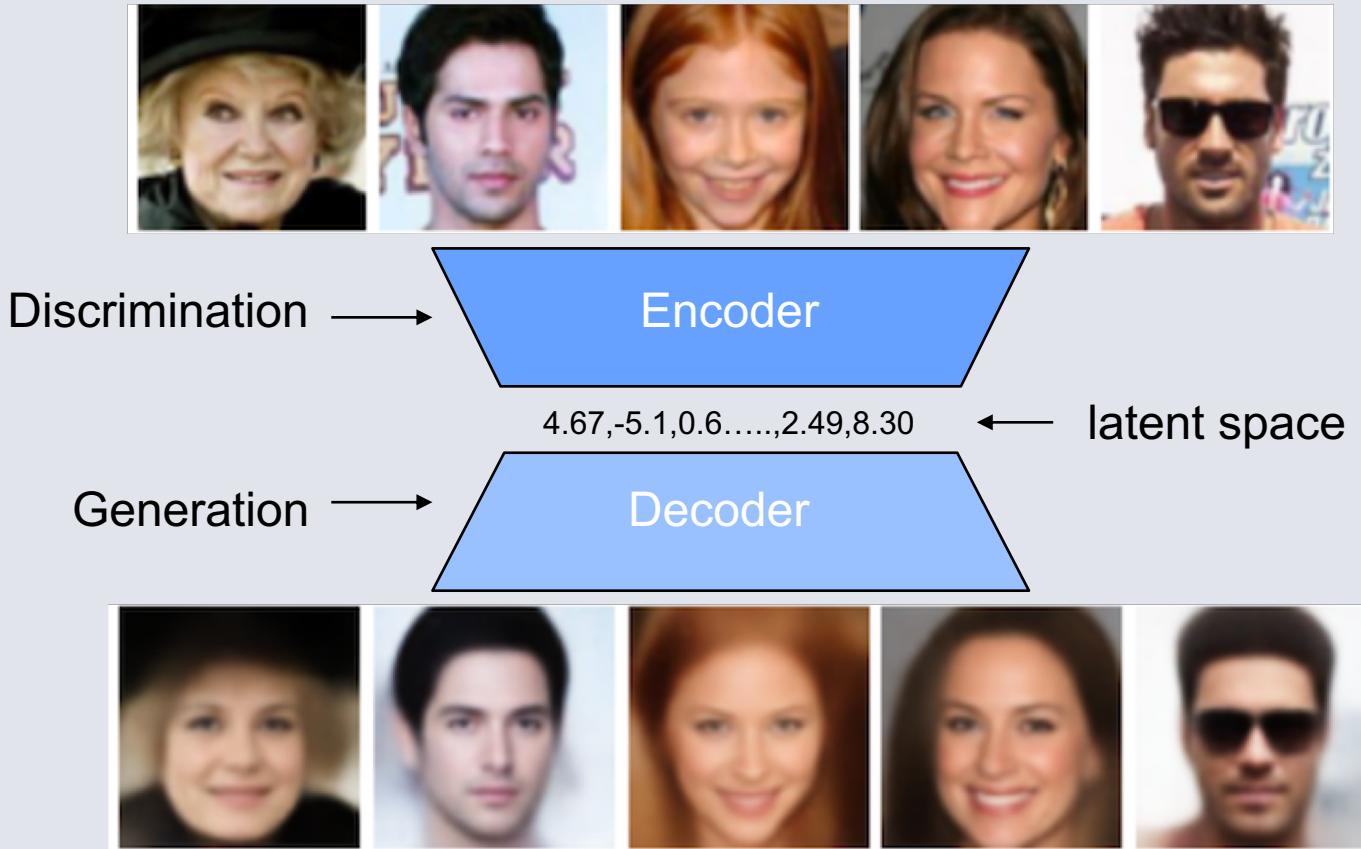
Auto Encoder



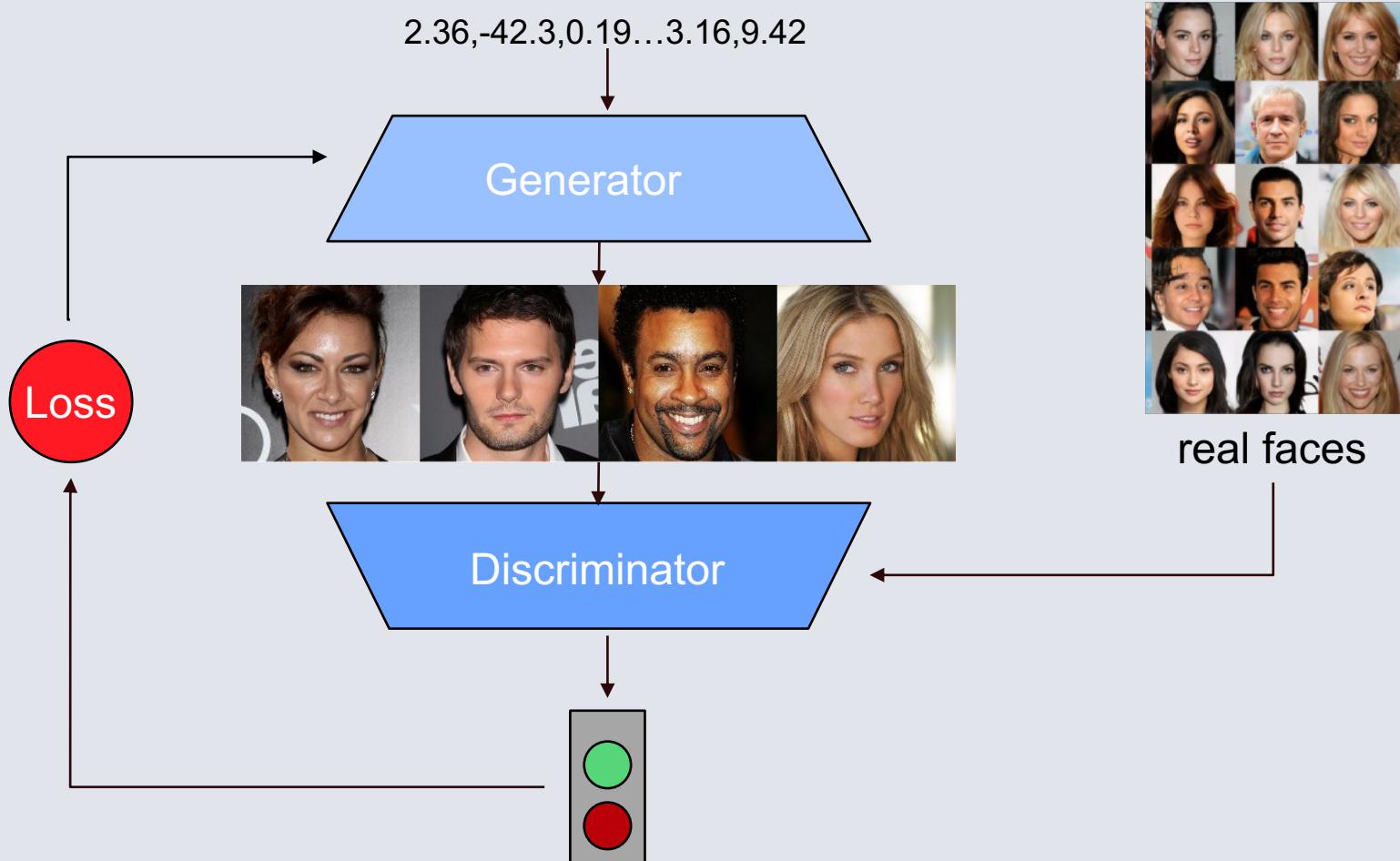
Auto Encoder



VARIATIONAL AUTO ENCODERS

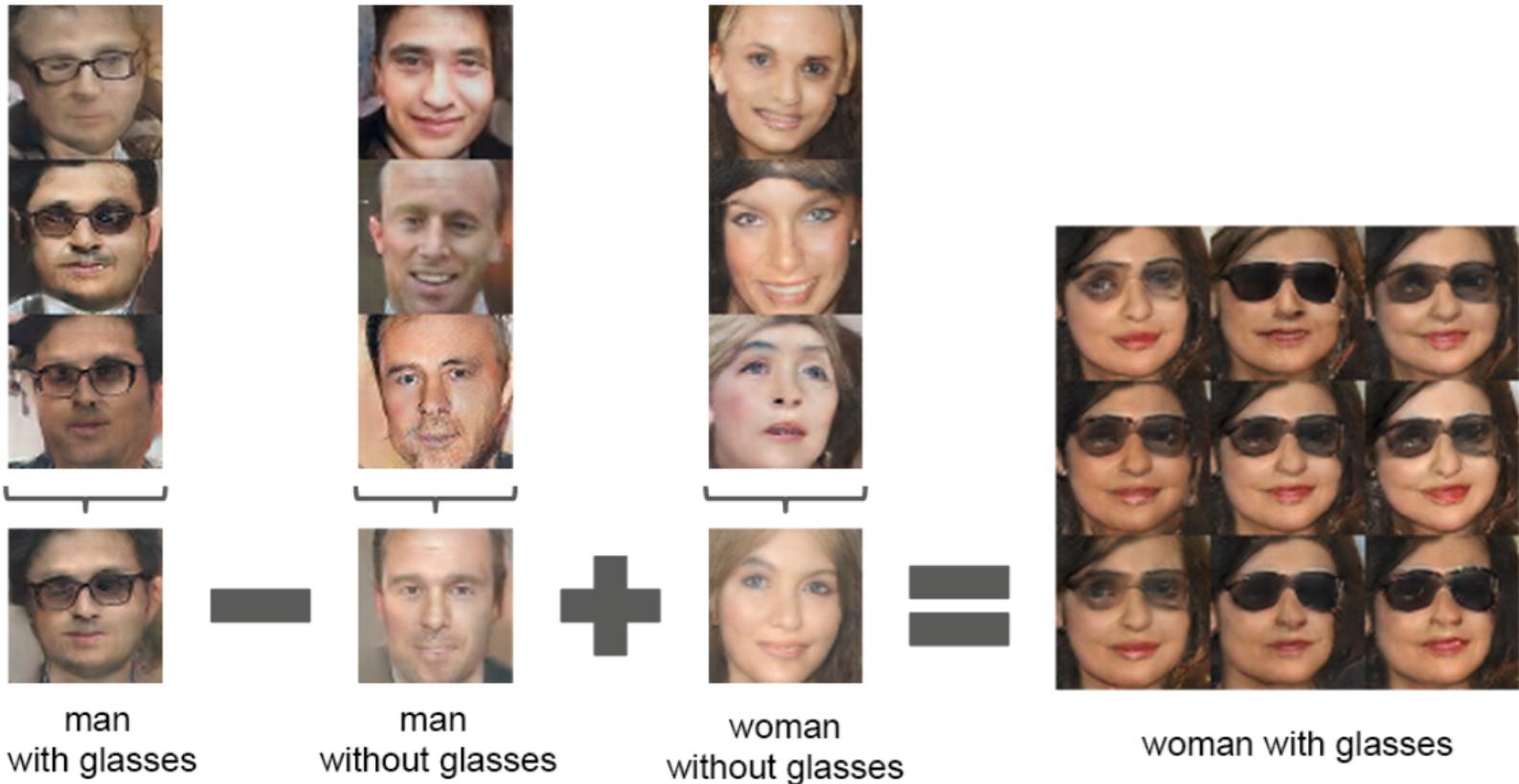


Generative Adversarial Networks



THE GENERATIVE WORLD!

Vector arithmetic

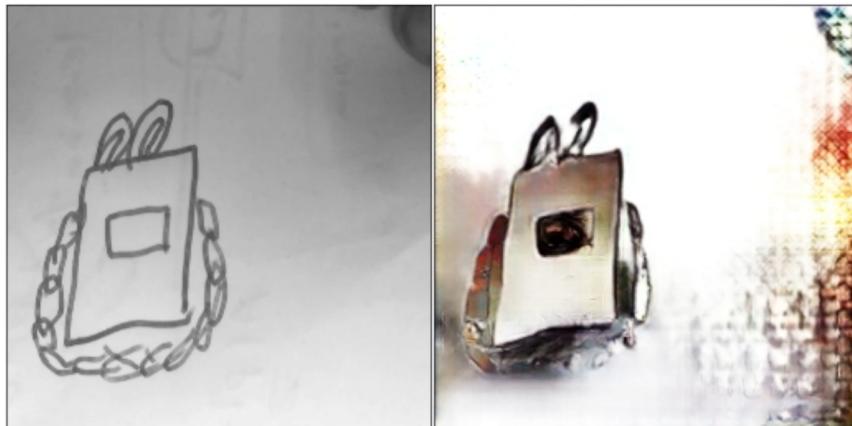


Pix2Pix

← → ⌂ ⓘ 127.0.0.1:49367/drawpix/index.html

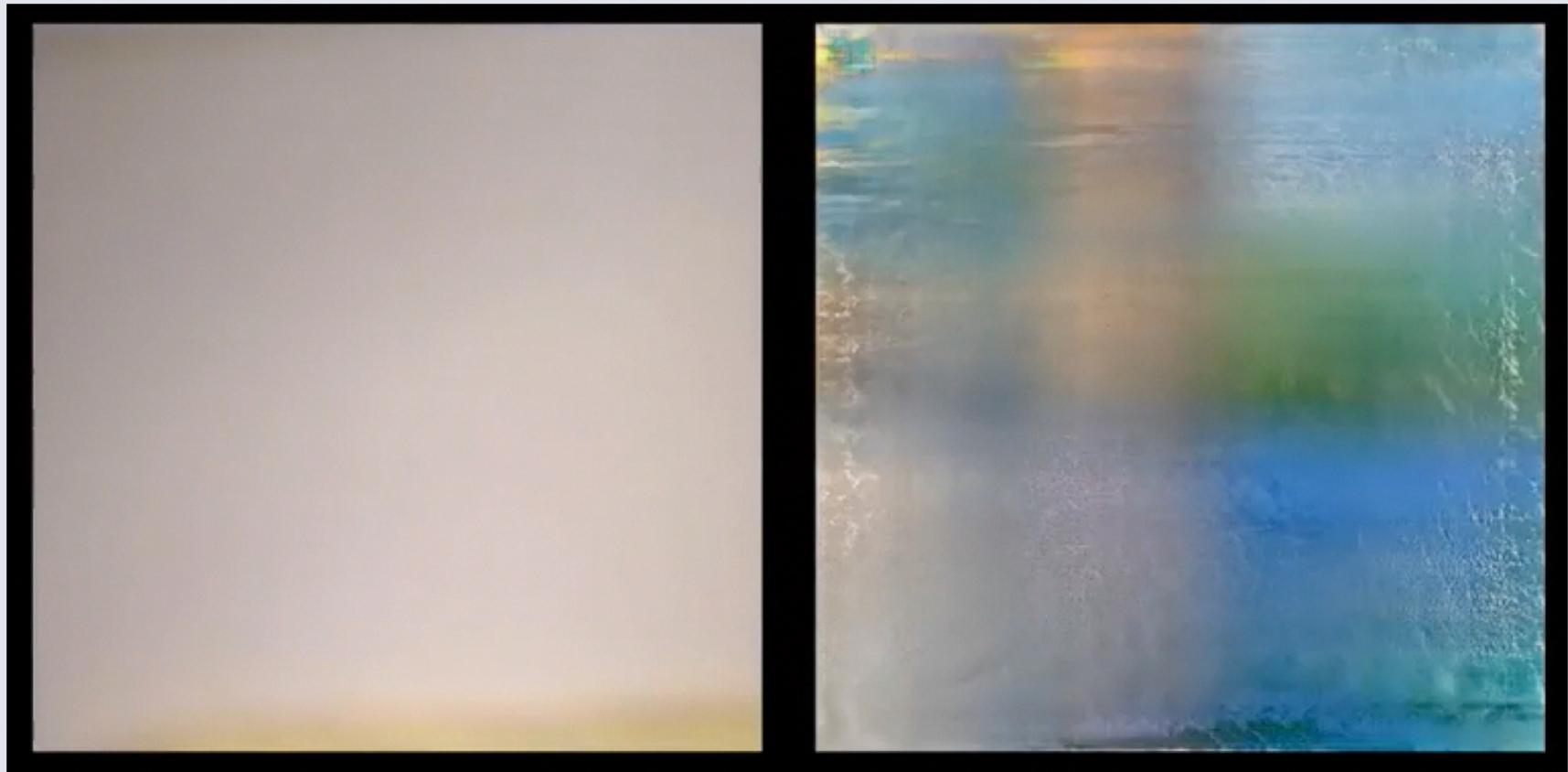
Pix2Pix

Done!



Clear! Cats Pikachu shoes handbags

PIX TO PIX CANNY EDGE DETECTOR



Face to Face



Real-time Reenactment



Reenactment Result

Everybody dance now!

Source Subject



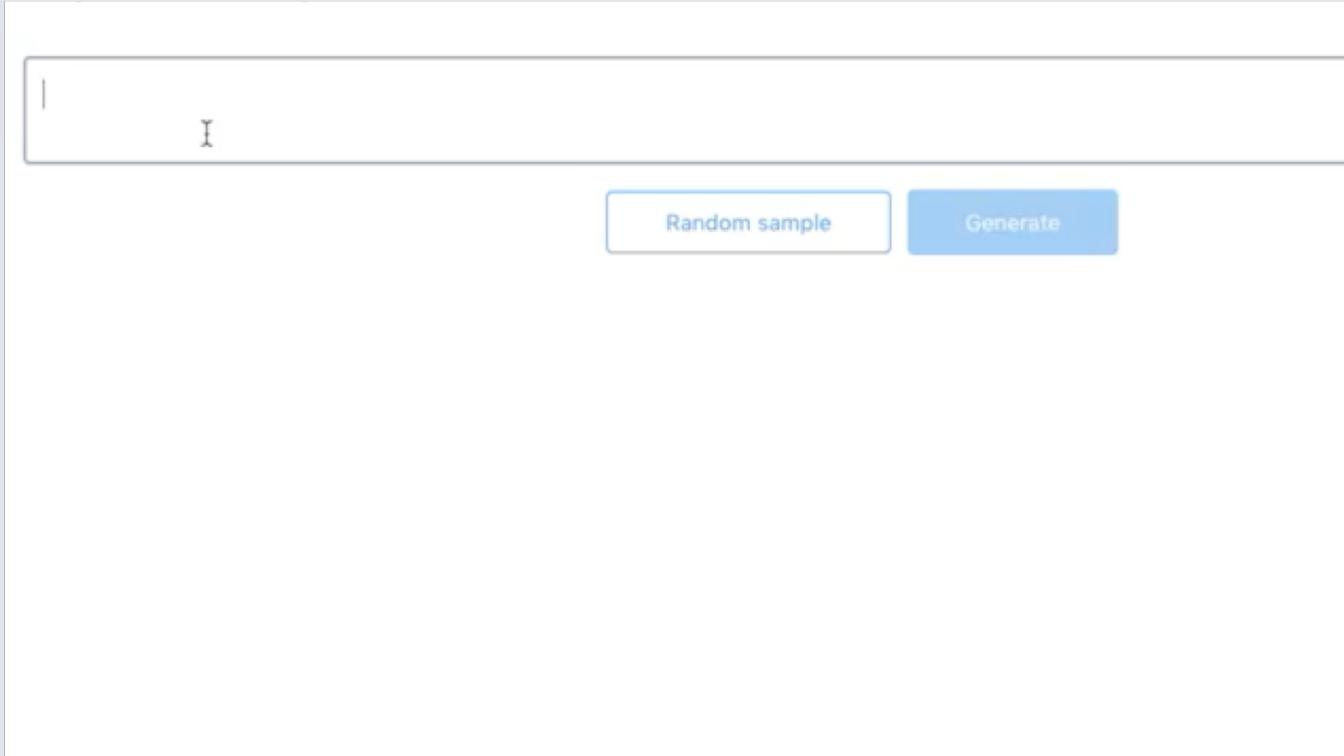
Vid2Vid



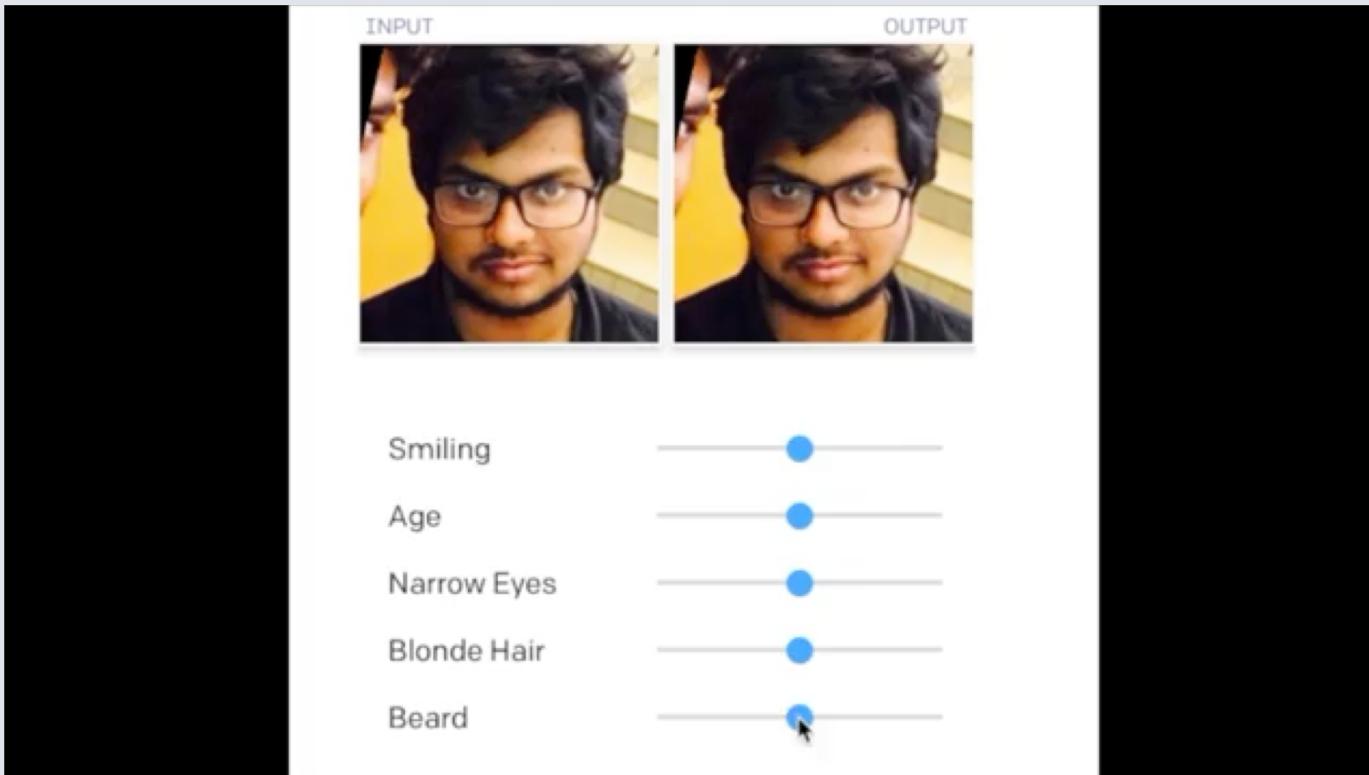
CycleGan



Voice Modelling



Facial Attribute Manipulation



2D to 3D Facial Reconstruction

3D Face Reconstruction from a Single Image

Drag the 3D model around with your mouse. You can checkout the paper and code [here](#).

If it is blank, it may be an issue with WebGL or browser. Sometimes this happens with Chromium, but not Google Chrome, as far as I know.

Download Wavefront OBJ File
(colours are stored per-vertex)

Try another image

Z Translate: ——○————

Show background image

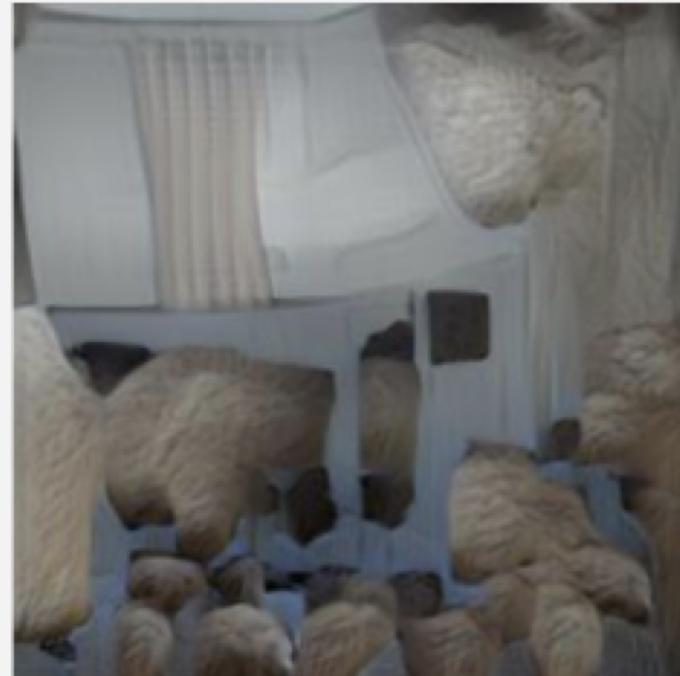
Please share and spread the word!

[Twitter](#) [LinkedIn](#) 3,363

aaron.jackson@nottingham.ac.uk ([website](#)) • WebGL rendering done with the Three.js framework.

text to image generation

The sheep
are in my
bedroom
jumping on
the bed



ProGAN Landscape generation



Image to Sound



Press **esc** to exit full screen

[17355]
17355

0:13 / 0:25

▶ 🔍 🔊 ⏪ ⏴

A painting depicting a lively street scene, likely from the 18th century. In the foreground, several figures in traditional European attire are engaged in what appears to be a dance or a social gathering. One man in a dark coat and white breeches is prominent, while others in colorful dresses and bonnets look on. The background shows buildings with thatched roofs under a bright sky. A small text box in the upper right corner of the image frame reads "Press esc to exit full screen". Below the image, a timestamp "[17355]" and the number "17355" are displayed. At the bottom, there are playback controls for a video, showing "0:13 / 0:25" and icons for play, volume, and download.

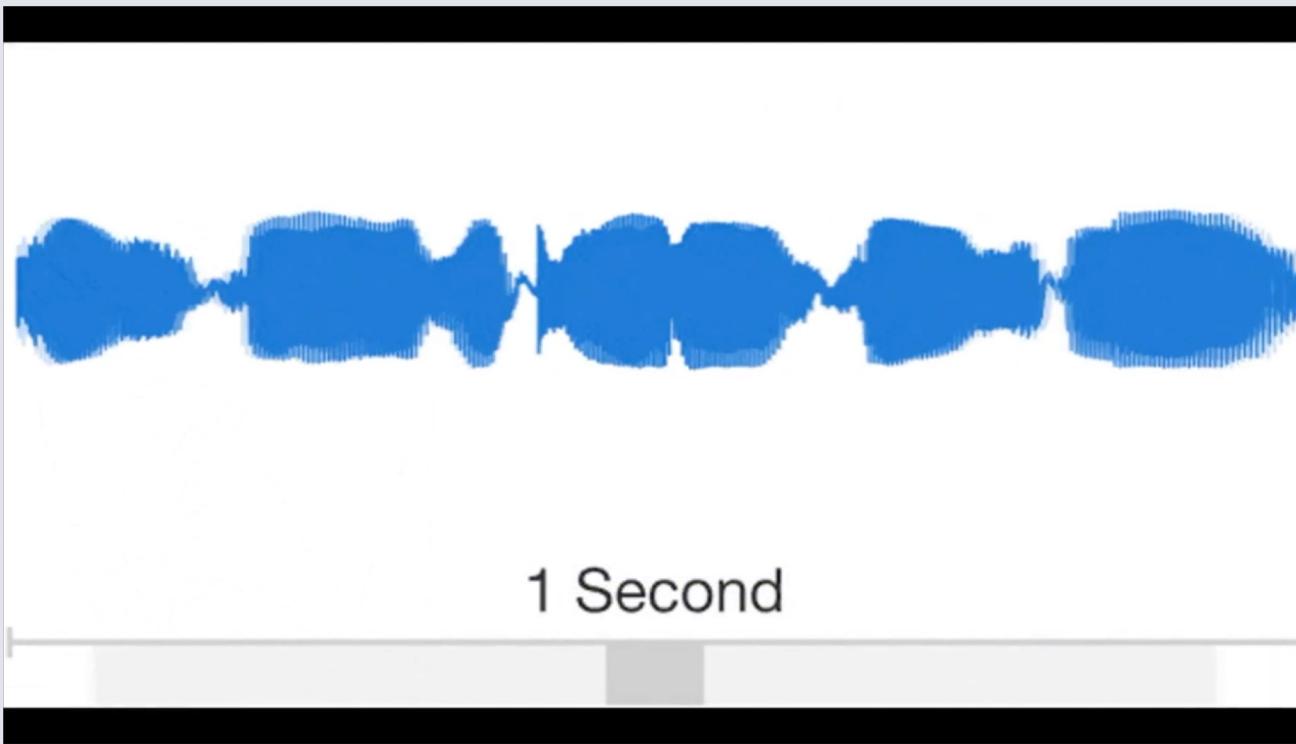
Progressive GANS



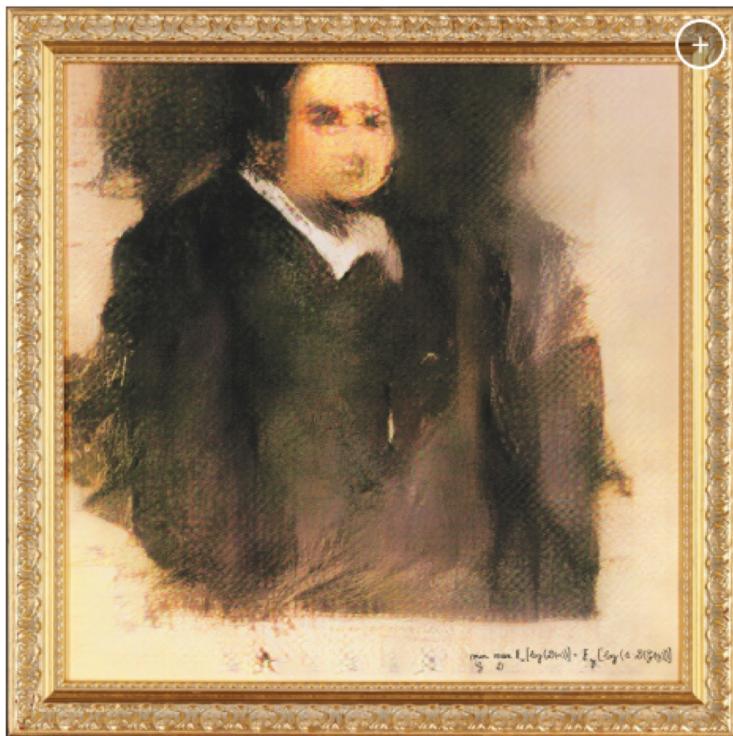
Writing the script for an ad

LEXUS PRESENTS
A FILM WRITTEN BY ARTIFICIAL INTELLIGENCE

Wavenets- Generating Music



AI GENERATED ART SOLD FOR \$432,500 (NEARLY 3CRORE INR)



Portrait of Edmond Belamy, 2018, created by GAN (Generative Adversarial Network). Sold for \$432,500 on 25 October at Christie's in New York. Image © Obvious

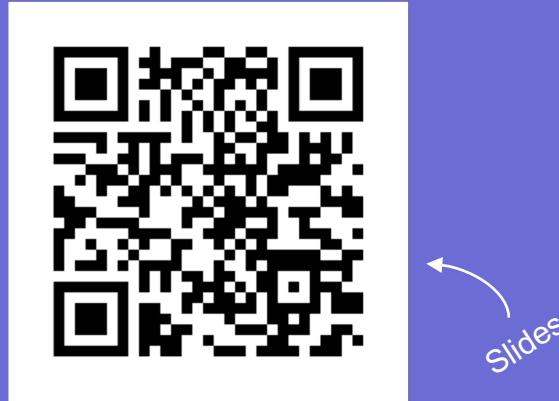
Checklist for Making a Movie

- ✓ WRITING THE SCRIPT
- ✓ CASTING
- ✓ CREATING THE VISUAL GRANDEUR
- ✓ GENERATING MUSIC

Any Questions?

Any Questions?

If AI actually makes a movie and it was blockbuster,
who would rightfully own the Profits?



Slides

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@Krishnac71

Thank you.

Krishn Balaga

Developer Advocate

—

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