

The Future of Machine Learning & JavaScript



Asim Hussain

@jawache

codecraft.tv

microsoft.com

Microsoft Cloud Developer Adv x

Guest

Secure

https://developer.microsoft.com/en-us/advocates/index.html

Microsoft

Search

Advocates

Map view


Tweets

Cloud Developer Advocates


We write, speak, and dream in code. Our global team is maniacal about making the world amazing for developers of all backgrounds. Connect with us, write code with us, and let's meet up and talk cloud and all things developer!

Map

Tweets




Cloud Developer Advocates



Aron Wislang

[@as_w](#)


Linux



Abel Wang

[@AbelSquidHead](#)


DevOps



Alena Hall

[@lenadroid](#)

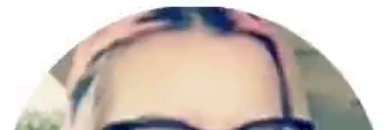
High Scale / Big Data



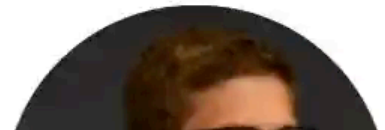
Anthony Chu

[@nthonyChu](#)


.NET



Asim Hussain



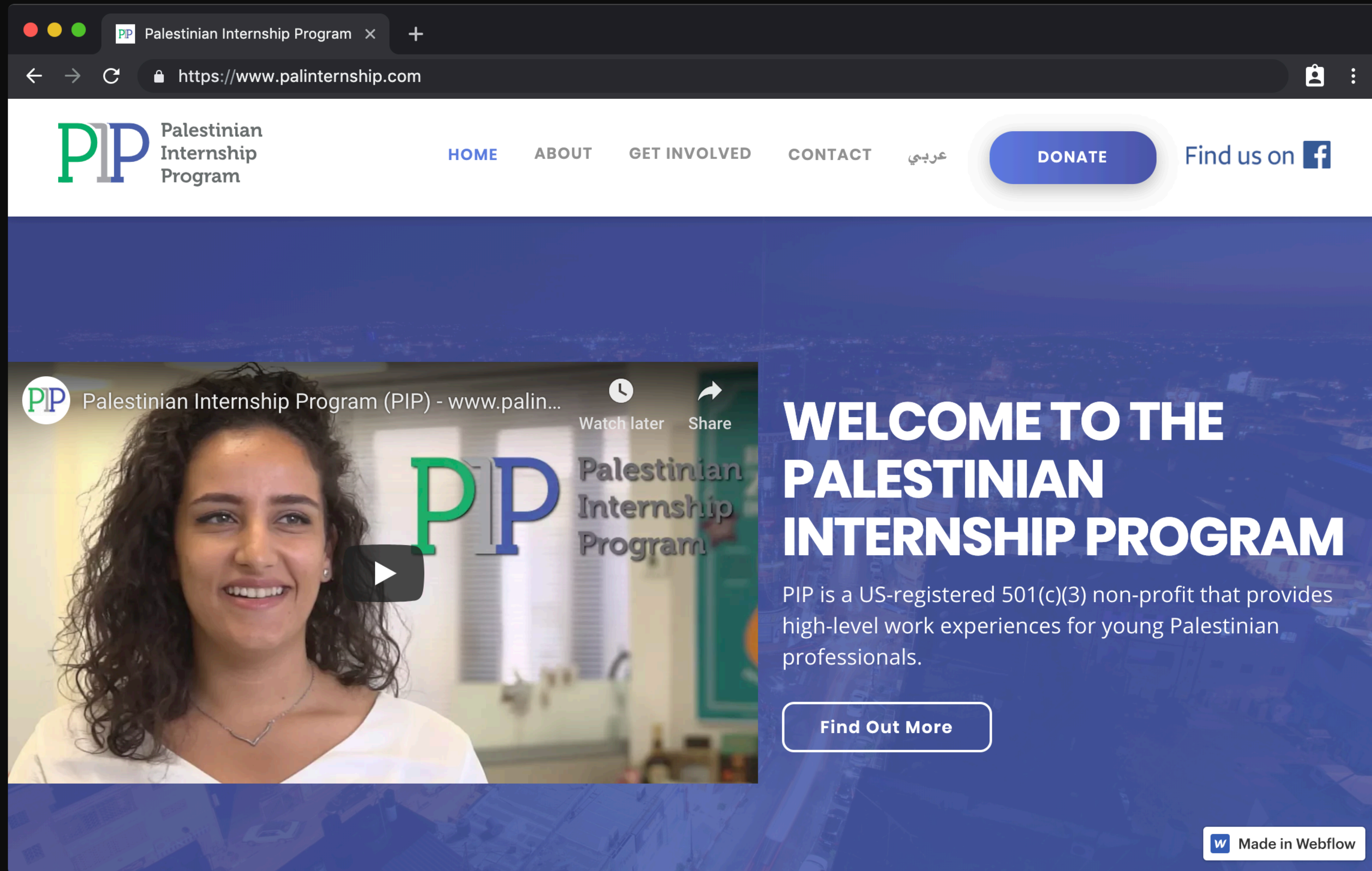
Bernd Verst



Benjamin Mitchell

<https://aka.ms/jawache-cda>

@jawache



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

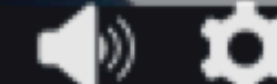
@jawache

ASIM

My name is awesome and I have over 16 years experience building applications for organizations like



0:15 / 3:31



This is @EleanorHaproff's slide



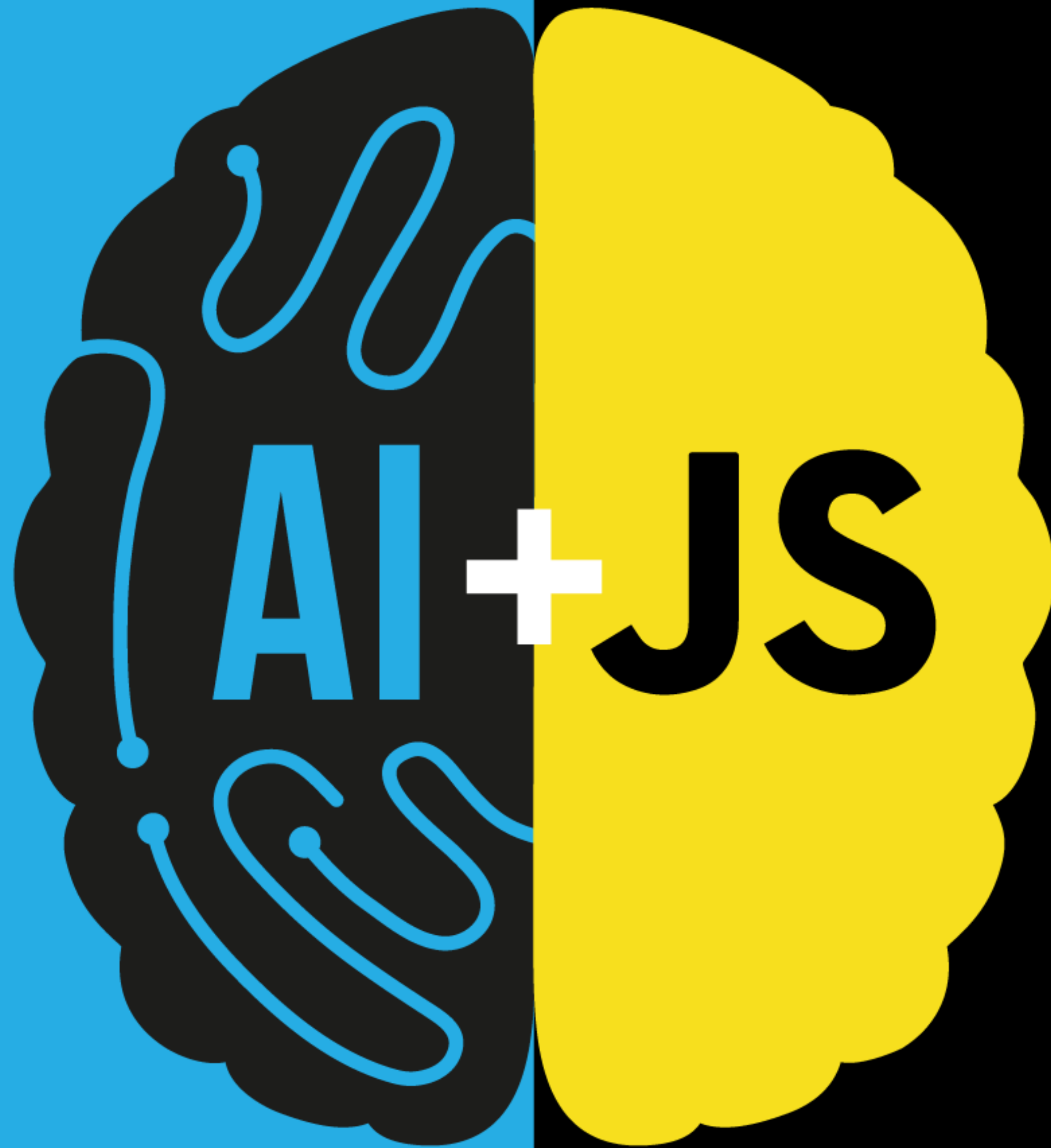
Machine
Learning



Asim



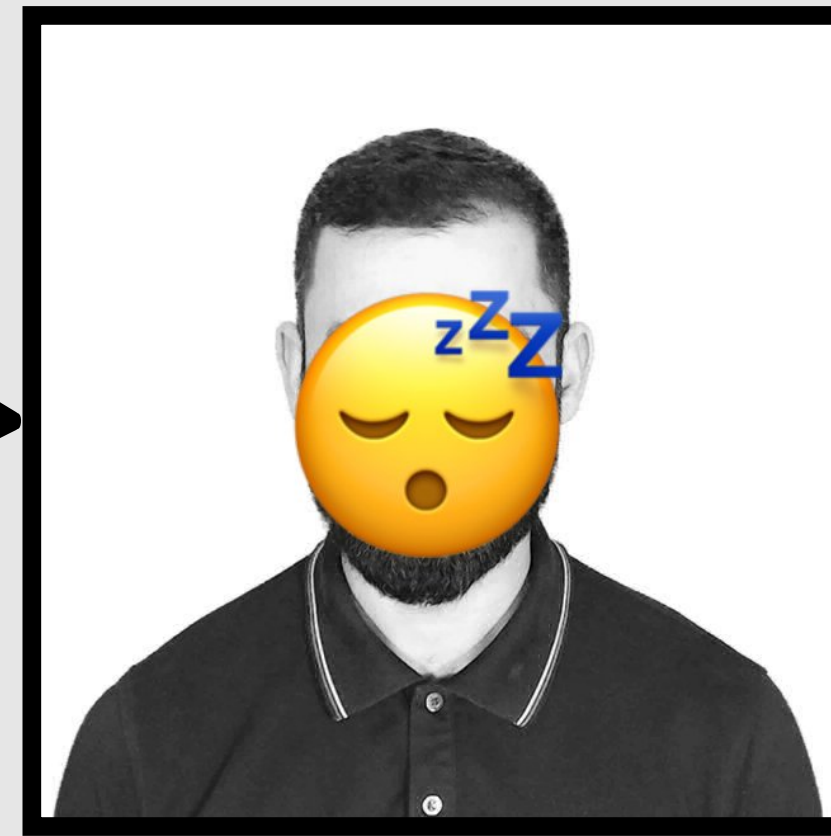
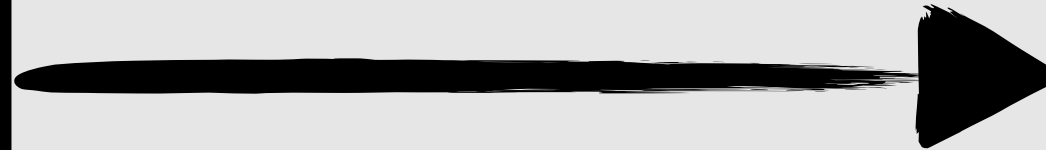
Web
Development

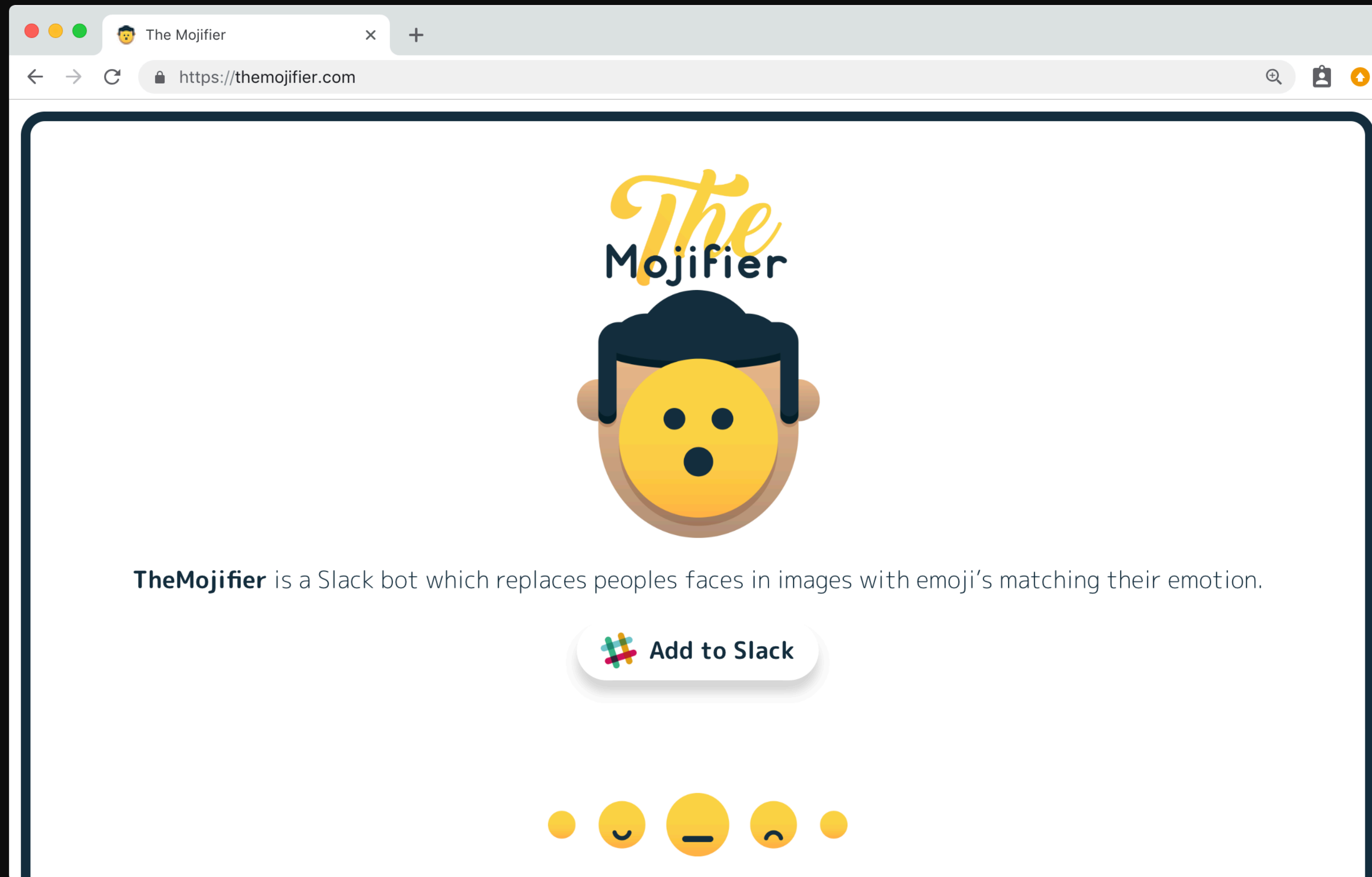


@aijavascript



TheMojifier™





🔒 empty2

☆ | 👤 1 | ✎ Add a topic



🔍 Search



🔒 empty2

You created this private channel today. This is the very beginning of the 🔒 empty2 channel.

✎ Set a purpose + Add an app 👤 Invite others to this private channel

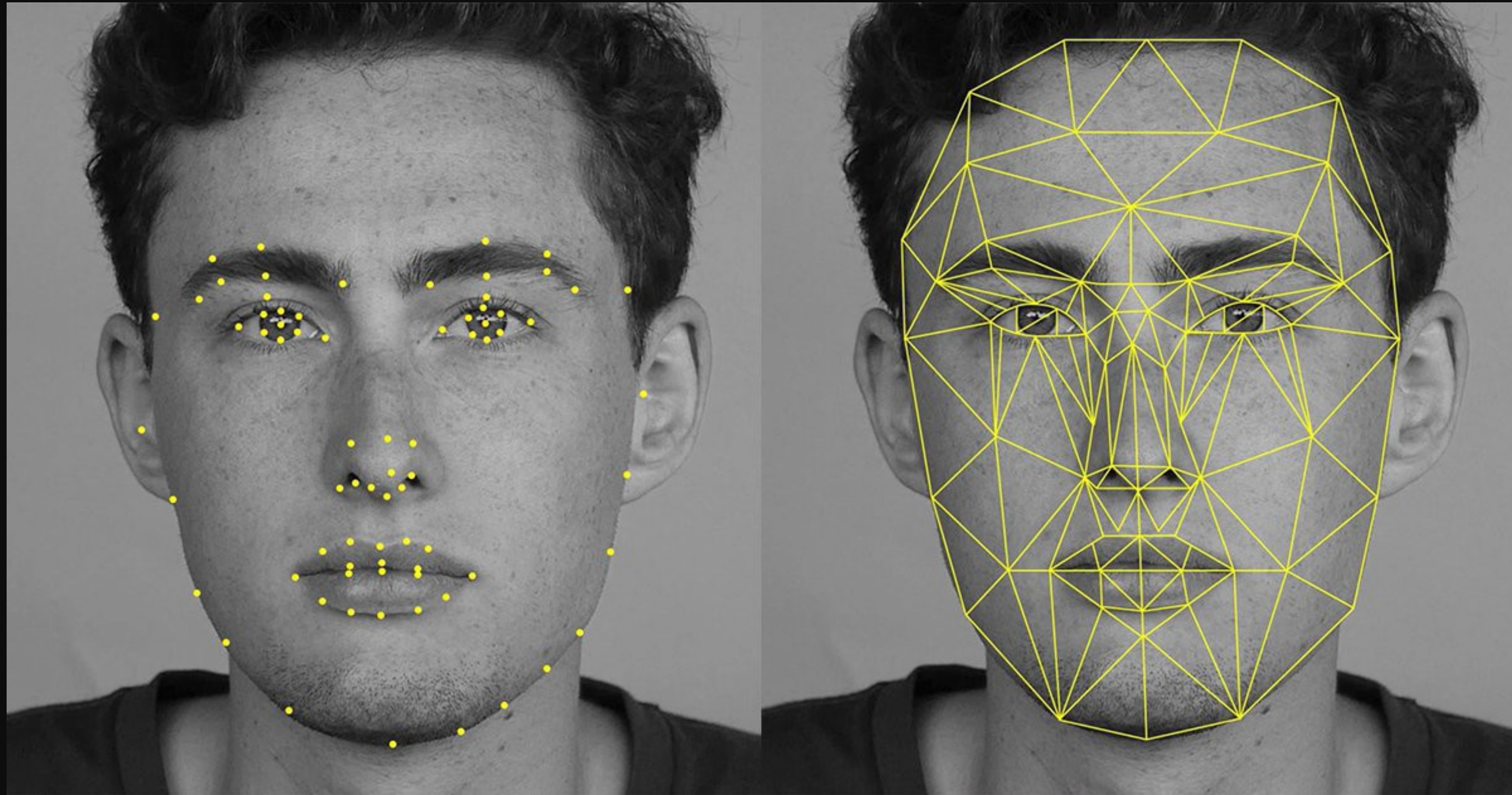


Message empty2



How to Calculate Emotion?

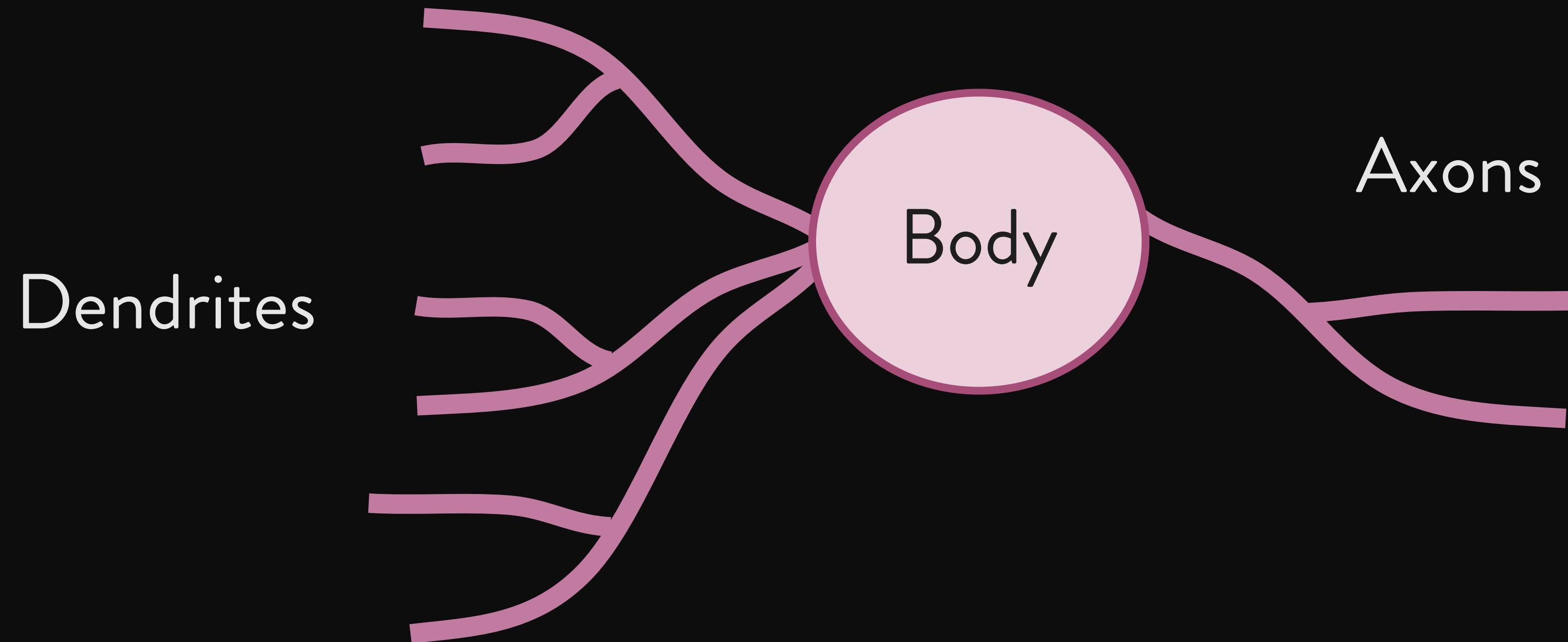
(1) Detect Facial Features



<https://towardsdatascience.com/facial-keypoints-detection-deep-learning-737547f73515>

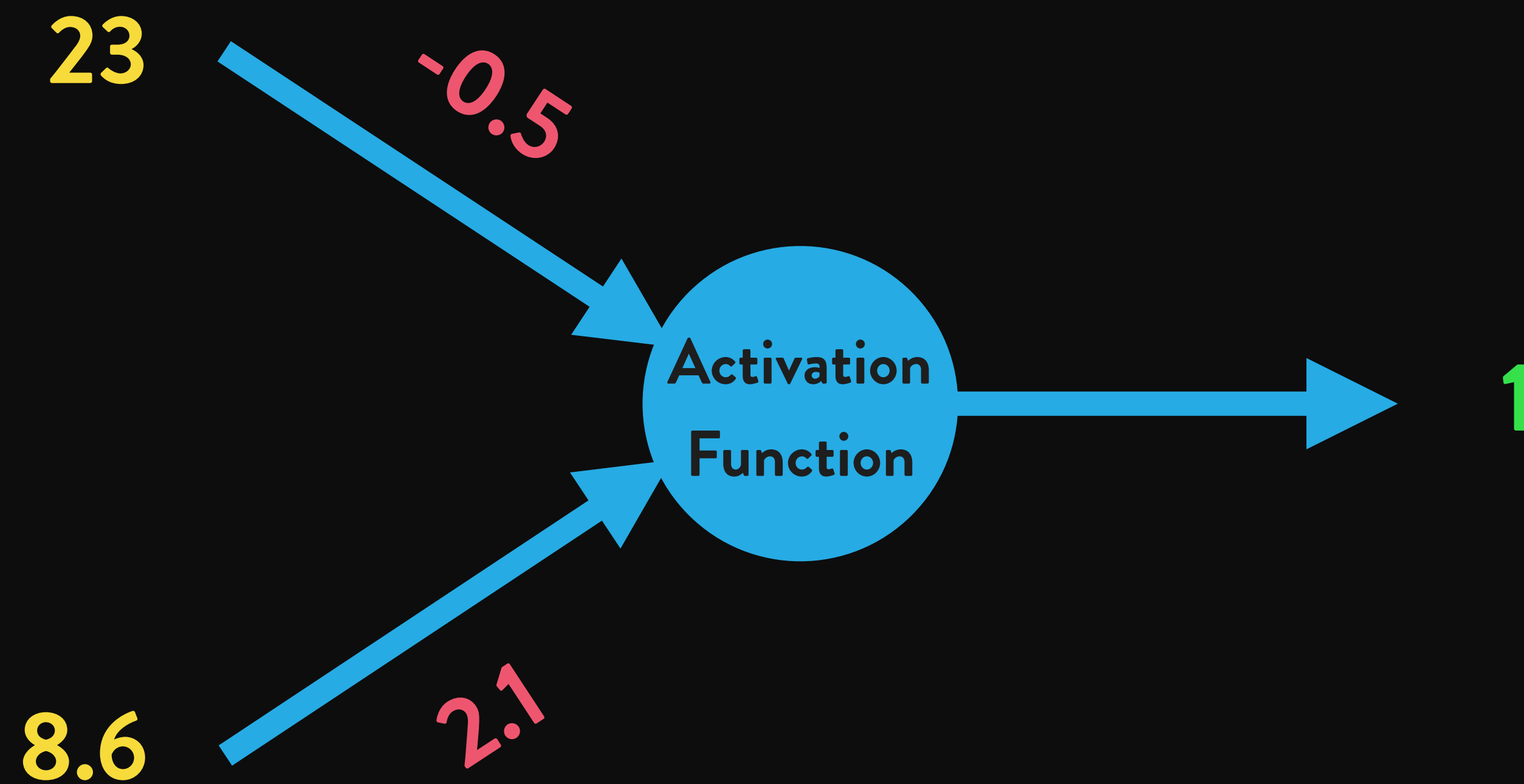
(2) Use a Neural Network

Neural Networks



Axon

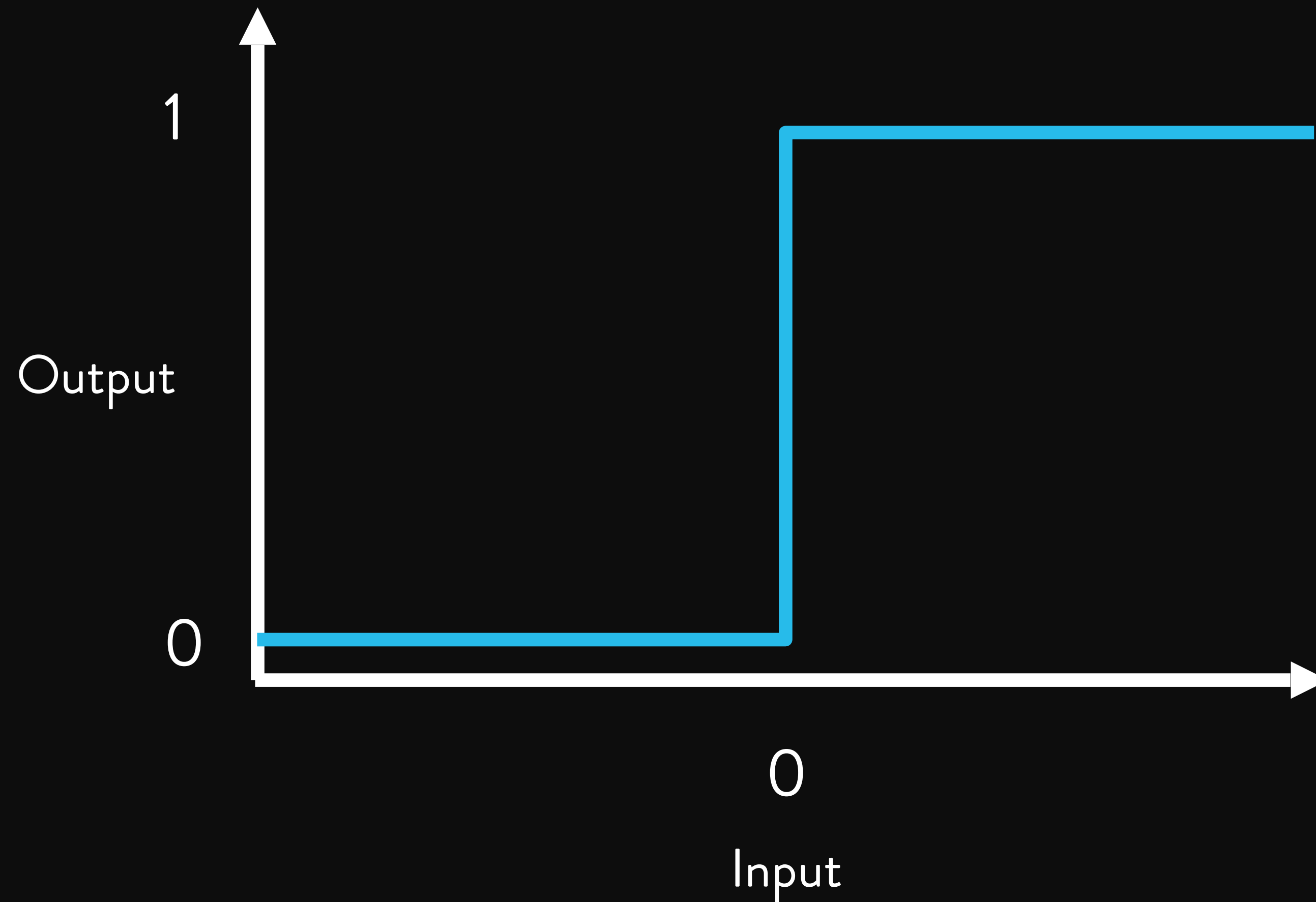
Neural Networks



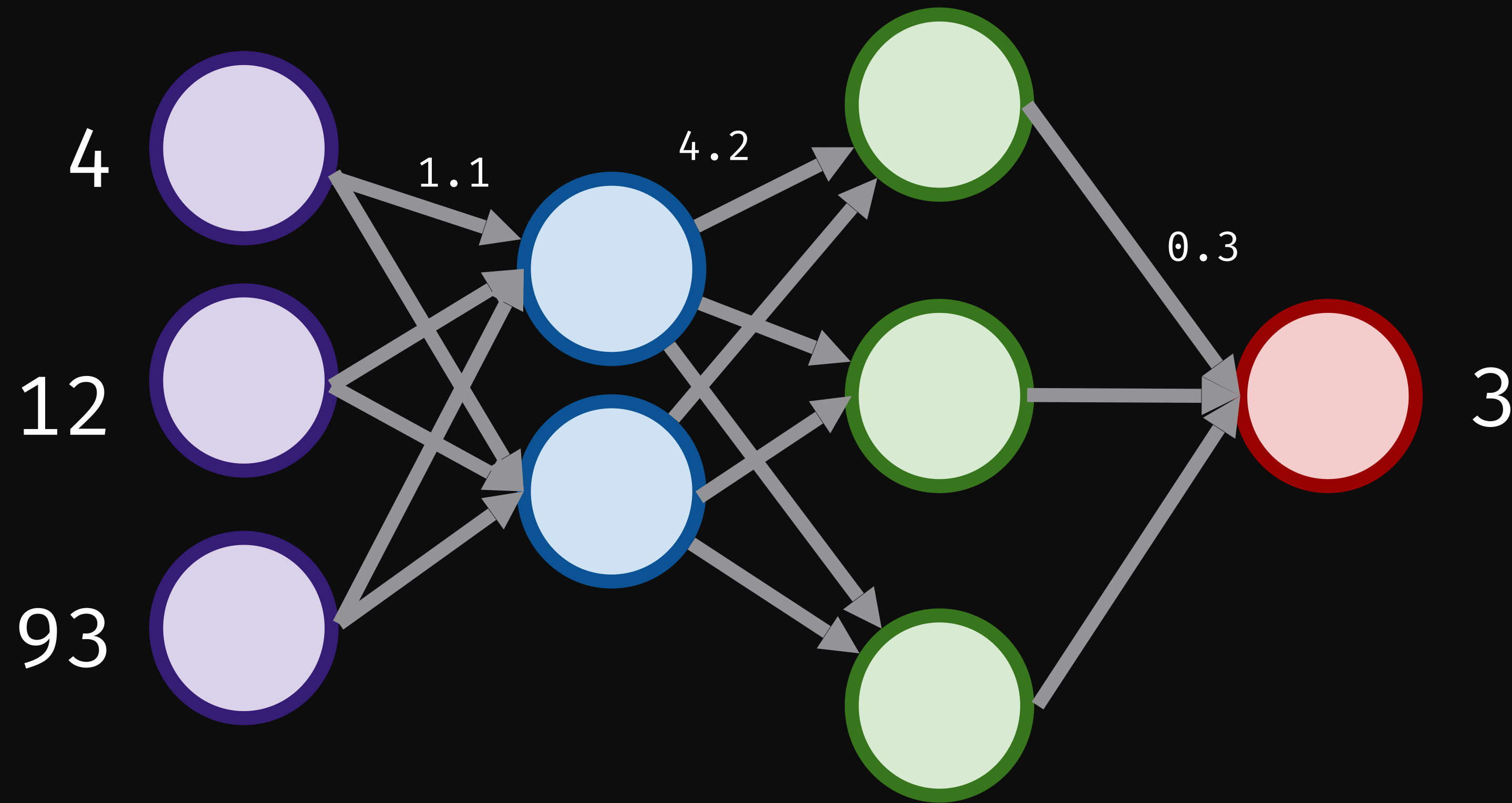
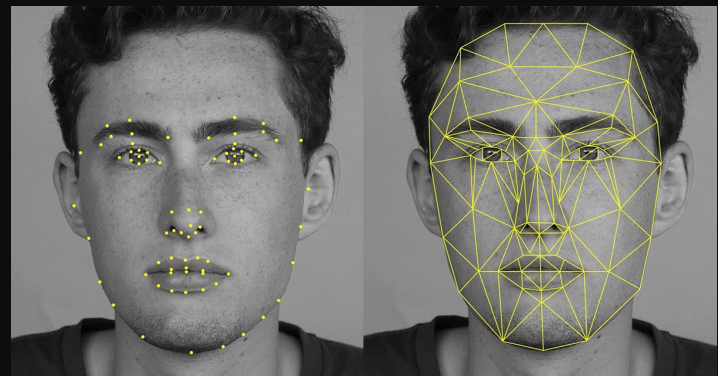
Neural Networks

$$\left. \begin{array}{l} 23 \times -0.5 = -11.5 \\ 8.6 \times 2.1 = 18.06 \end{array} \right\} 7.01 \rightarrow \text{activation}(\dots) \rightarrow 1$$

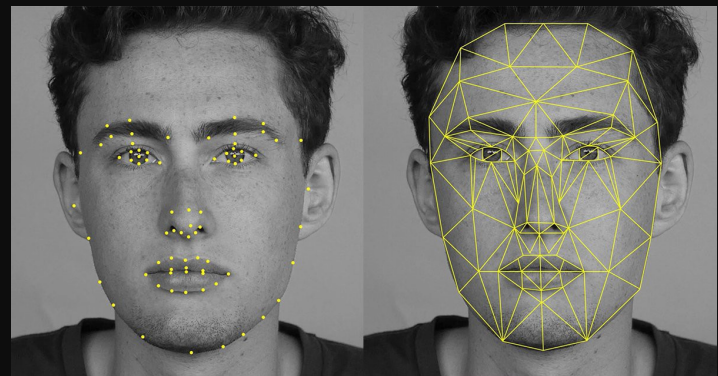
Neural Networks



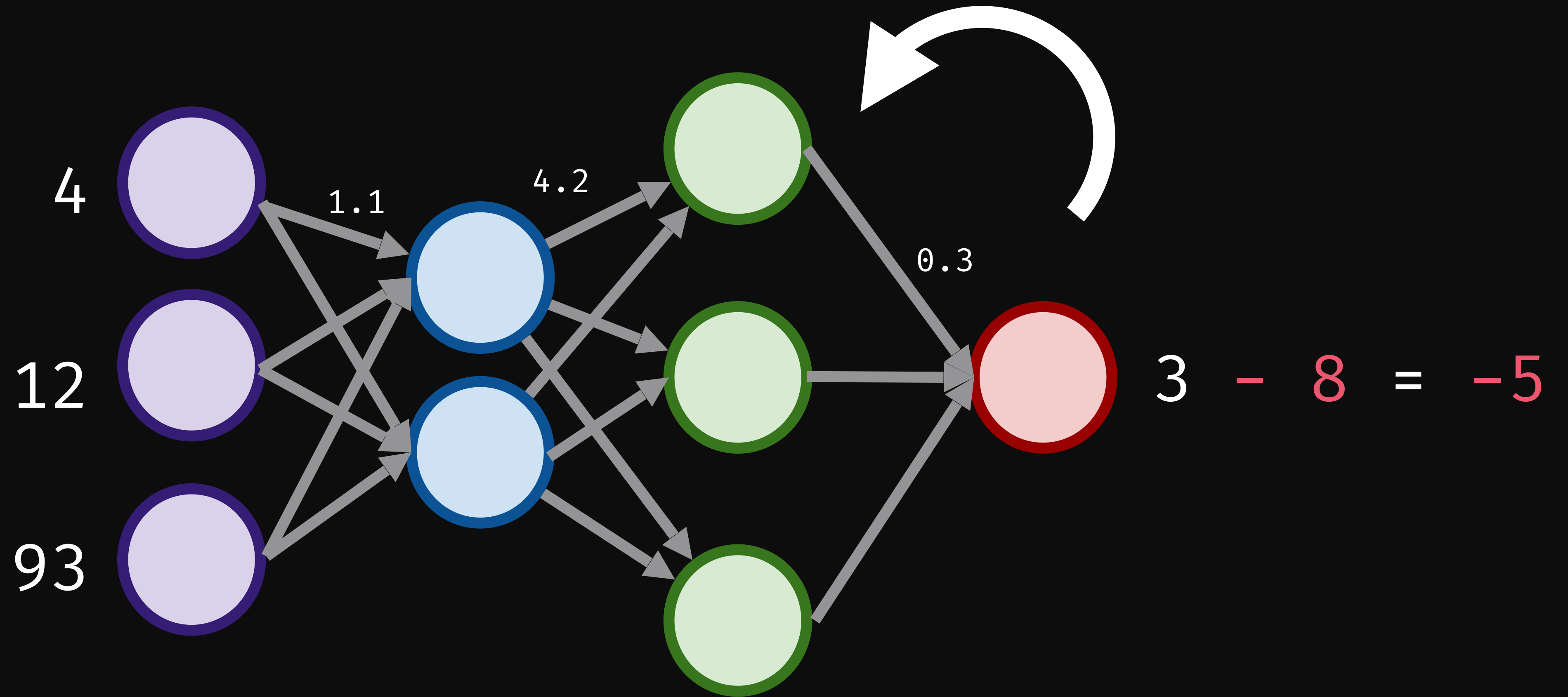
Neural Networks



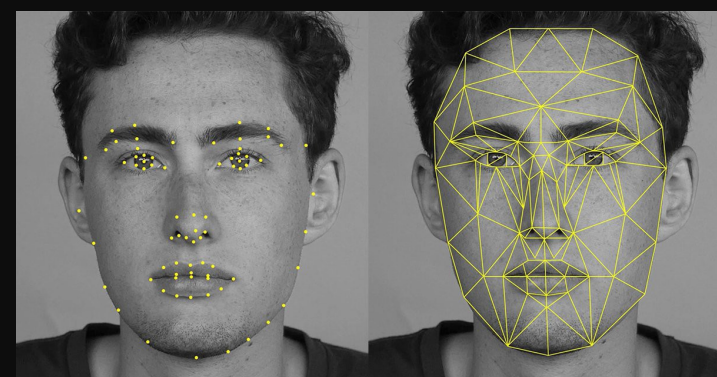
Neural Networks



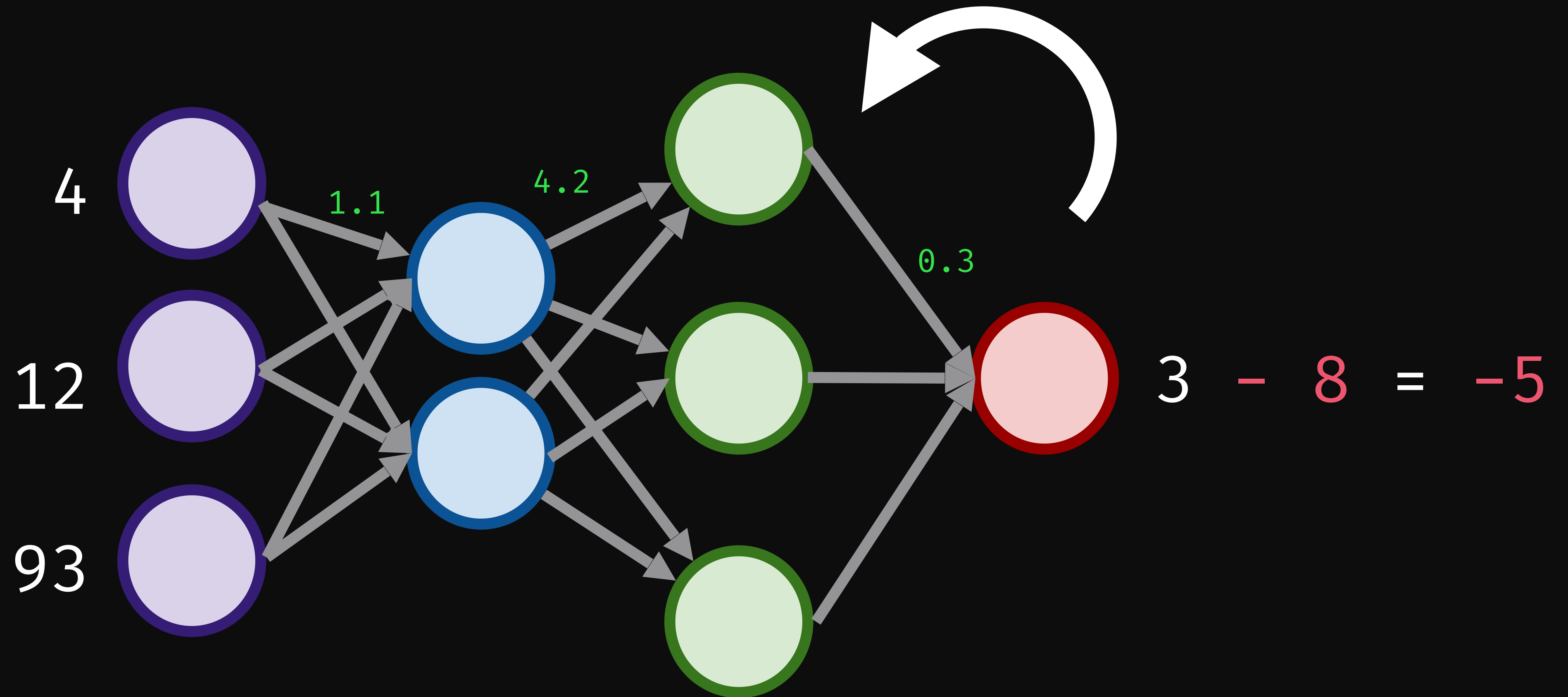
8



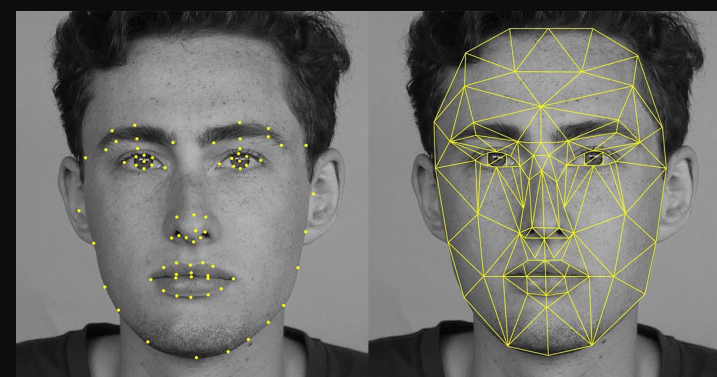
Neural Networks



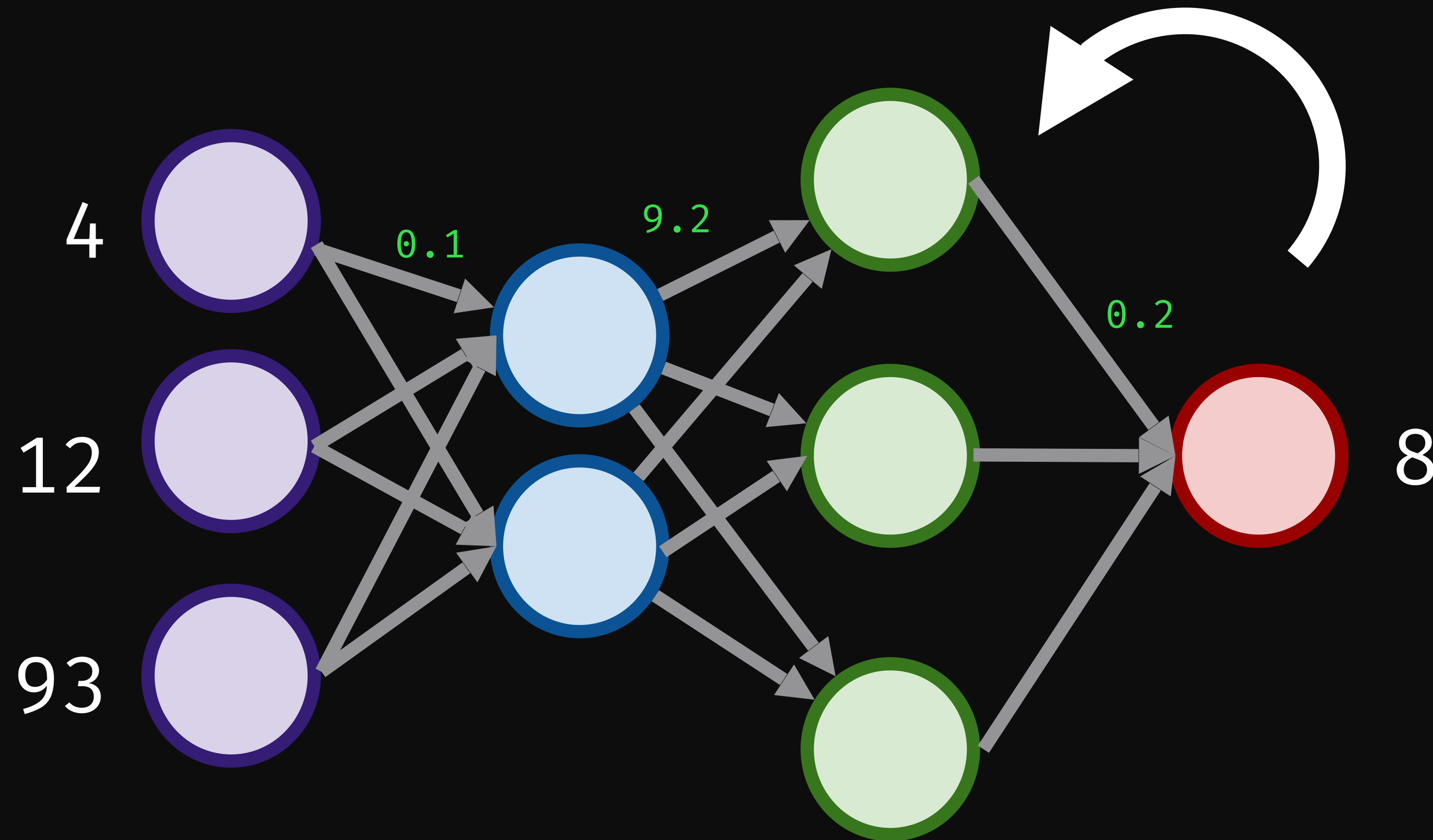
8



Neural Networks



8



Face API - Facial Recognition S x

Guest

Secure

https://azure.microsoft.com/en-us/services/cognitive-services/face/

Microsoft Azure

Contact Sales: 1-800-867-1389

Search

My account

Portal

Sign in

Overview

Solutions

Products

Documentation

Pricing

Training

Marketplace

Partners

Support

Blog

More

Free account

Home > Products > Cognitive Services > Face

Face

✓ Detect human faces and compare similar ones

✓ Organize images into groups based on similarity

✓ Identify previously tagged people in images

Try Face

Explore Cognitive Services:

Documentation

API reference

SDK

Pricing

Portal

Try Face API

Stack Overflow

Roadmap

Face verification

Check the likelihood that two faces belong to the same person. The API will return a confidence score about how likely it is that the two faces belong to one person.

<https://azure.microsoft.com/services/cognitive-services/face/>

@jawache


```
https://<region>.api.cognitive.microsoft.com/face/v1.0/detect
```

```
{  
  "url": "<path-to-image>"  
}
```

```
[
  {
    "faceRectangle": {
      "top": 207,
      "left": 198,
      "width": 229,
      "height": 229
    },
    "faceAttributes": {
      "emotion": {
        "anger": 0.001,
        "contempt": 0.014,
        "disgust": 0,
        "fear": 0,
        "happiness": 0.306,
        "neutral": 0.675,
        "sadness": 0.003,
        "surprise": 0.001
      }
    }
  }
]
```


Summary

Summary

- Neural Networks are incredibly powerful
- Conceptually, they are simple to understand

TensorFlow,

MobileNet & I'm fine

HTML

```
1 <figure class="gallery">
2   <div class="gallery__frame displaytext
  loading">
3     loading mobilenet neural network
```

CSS (SCSS)

```
1 @keyframes fade-up {
2   to {
3     opacity: 1;
4   }
```

JS

```
1 class GalleryUI {
2   constructor(props) {
3     this.props = props;
4   }
```



33.23% miniskirt, mini
12.96% sandbar, sand bar
11.55% seashore, coast, seacoast, sea-coast





TensorFlow.js




```
import * as tf from '@tensorflow/tfjs';
```



```
<html>  
  <head>  
    <script src="https://cdn.jsdelivr.net/npm/@tensorflow/tfjs@0.8.0"> </script>  
  </head>  
</html>
```


TensorFlow.js

Train models




```
const model = tf.model({\*...\*});  
  
await model.fit(xData, yData, {  
  batchSize: batchSize,  
  epochs: epochs,  
});
```

Load pre-trained models



```
const model = await tf.loadModel("model.json");
```

MobileNet



```
import * as mobilenet from '@tensorflow-models/mobilenet';

const img = document.getElementById('img');

// Load the model.
const model = await mobilenet.load();

// Classify the image.
const predictions = await model.classify(img);

console.log('Predictions: ');
console.log(predictions);
```


Image Processing with the Com x

https://azure.microsoft.com/en-us/services/cognitive-services/computer-vision/

Microsoft Azure

Contact Sales: 1-800-867-1389

Search

My account

Portal

Sign in

Overview Solutions **Products** Documentation Pricing Training Marketplace Partners Support Blog More

Free account >

Home / Products / Cognitive Services / Computer Vision

Computer Vision

Extract rich information from images to categorize and process visual data—and perform machine-assisted moderation of images to help curate your services.

Try the Computer Vision API >

Explore Computer Vision: Documentation API SDK Pricing Portal Try Computer Vision Stack Overflow

carbon (30).png ^ carbon (29).png ^

Show All x

<https://azure.microsoft.com/services/cognitive-services/computer-vision/>

@jawache

CodePen - Dynamically Genera x

+

← → ↻

https://codepen.io/sdras/full/jawPGa/

☆ H ⋮

Dynamically Generated Alt Text with Azure's Computer Vision API

A PEN BY Sarah Drasner PRO

Fork

Change View

Log In

Sign Up

Dynamically Generated Alt Text

With Azure's Computer Vision API

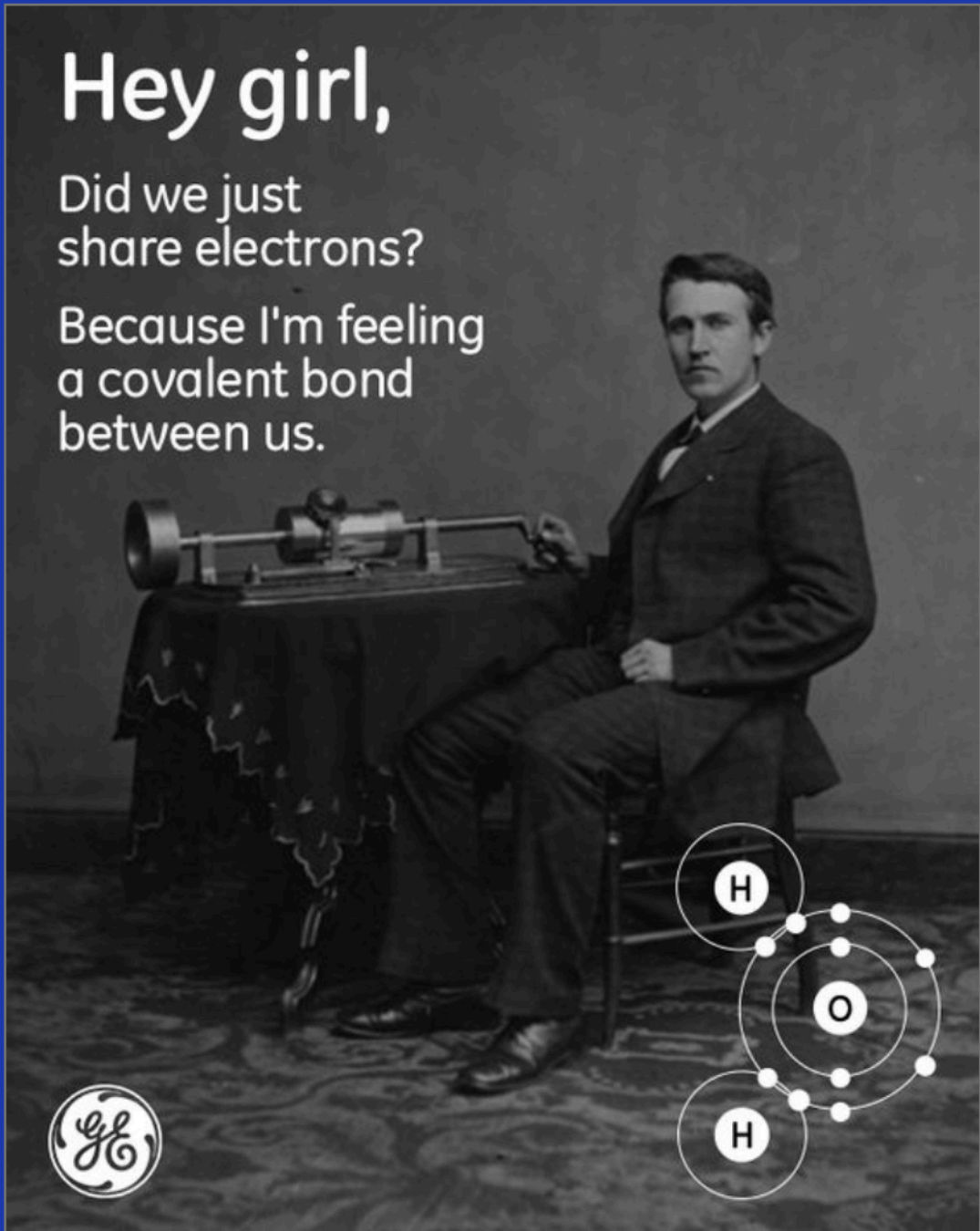
[Check out the docs →](#)

Try it again!

[More info...](#)

Alt text:

A black and white photo of Thomas Edison, the text says: "Hey girl, Did we just share electrons? Because I'm feeling a covalent bond between us."

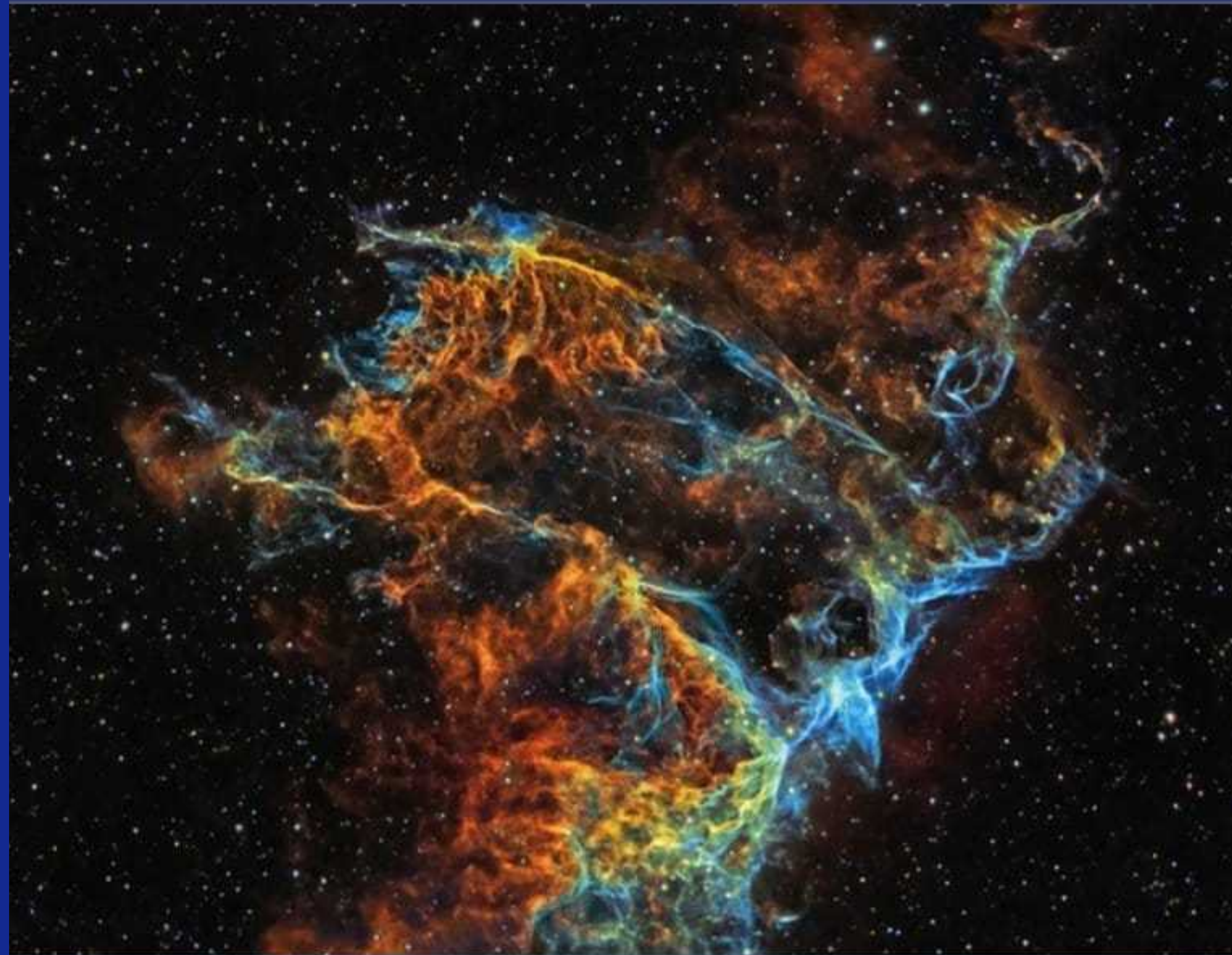


https://codepen.io/sdras/full/jawPGa/

@jawache

Alt text:

A star filled sky, the text says: "4ㅍㅍ."



<https://twitter.com/ollee/status/930303340516216832>

@jawache

Alt text:

A group of stuffed animals on a bed



<https://twitter.com/FrontendNE/status/930120267992616960>

@jawache

Alt text:

A man and a dog posing for the camera



<https://twitter.com/chrispiecom/status/930407801402347520>

@jawache

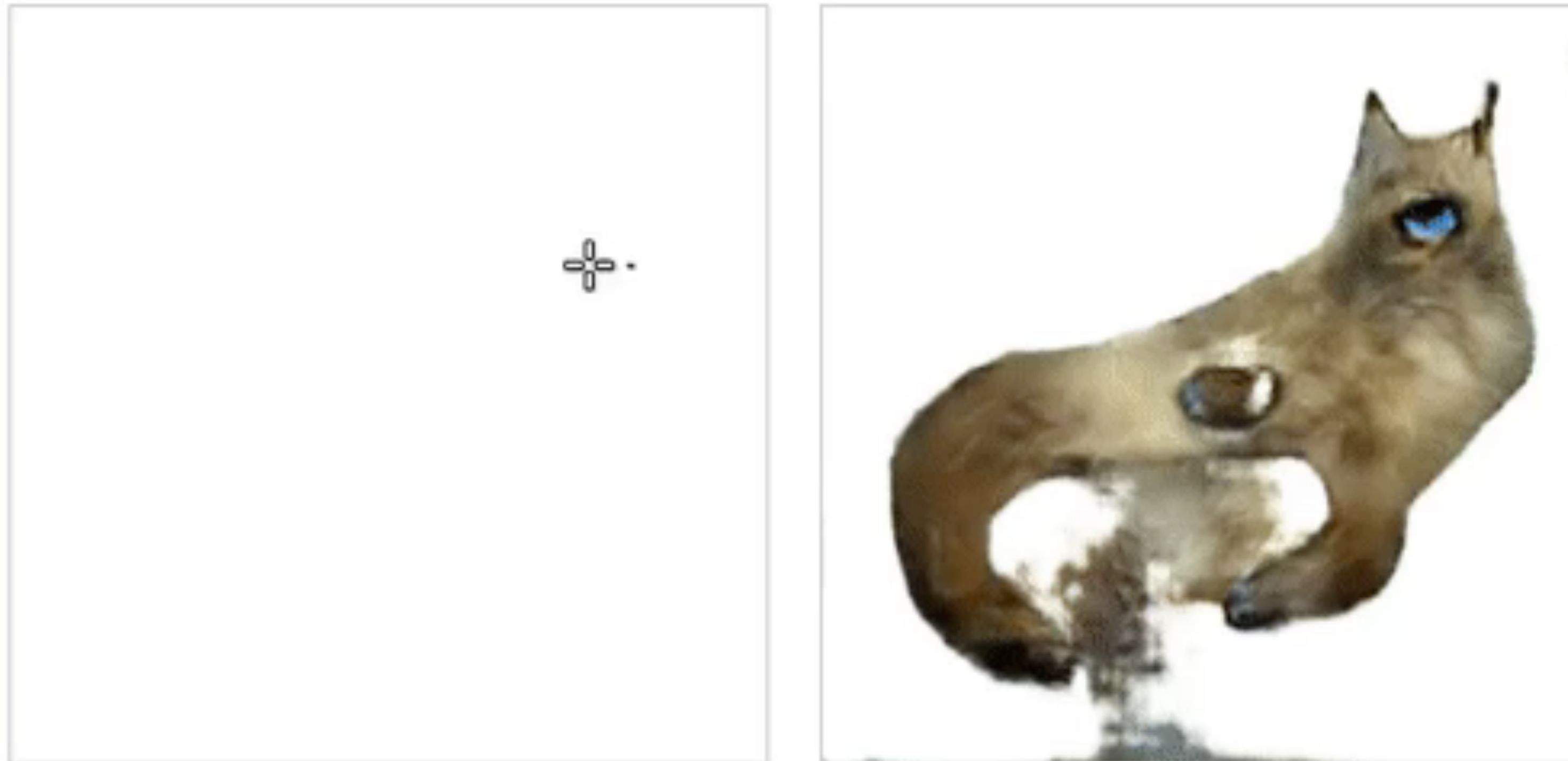
Summary

Summary

- TensorFlow.js doesn't have any dependencies
- MobileNet is a simple way to analyse images
- Azure Computer Vision API ❤️

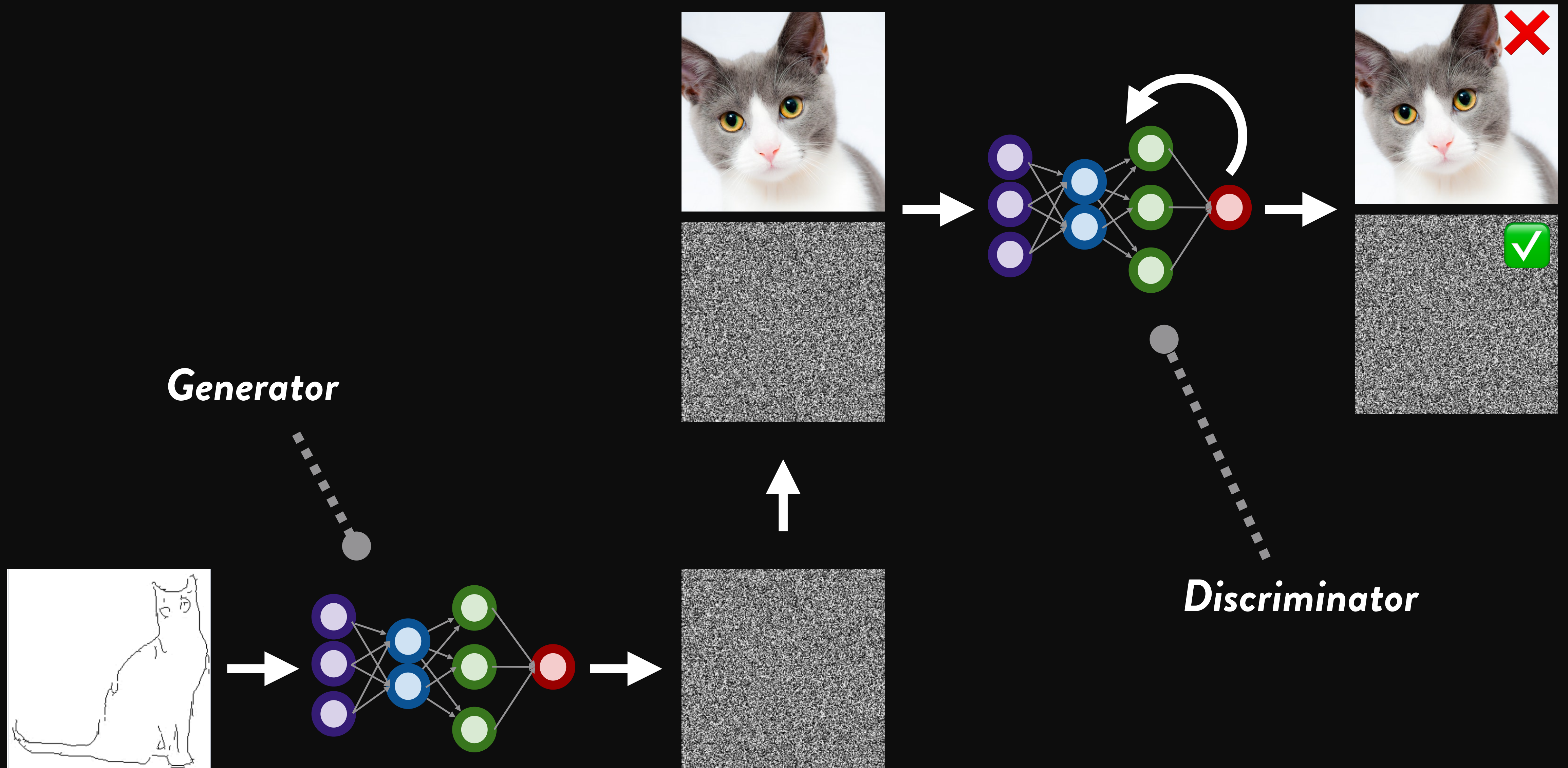
Image2Image

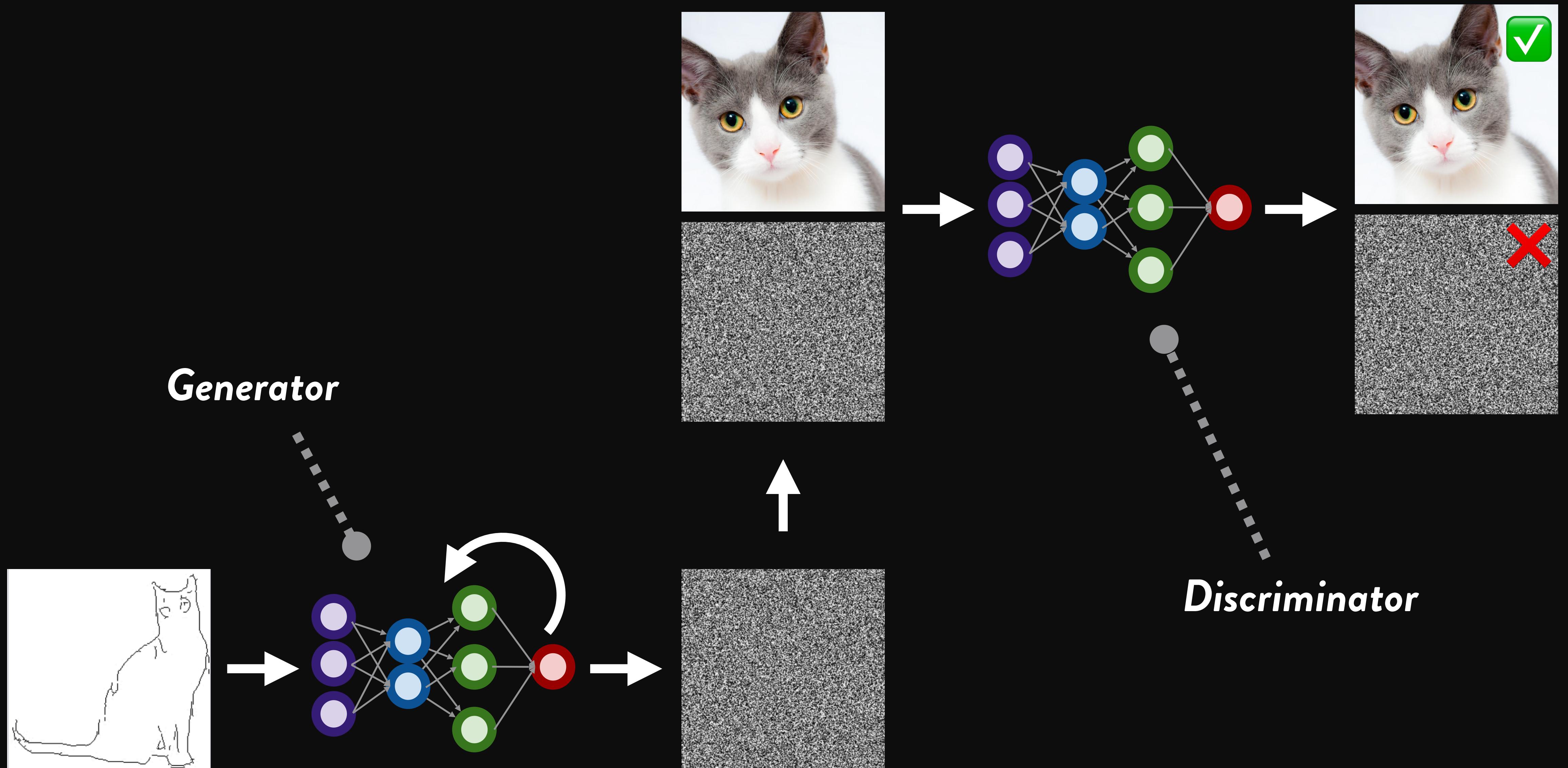
Model Loaded

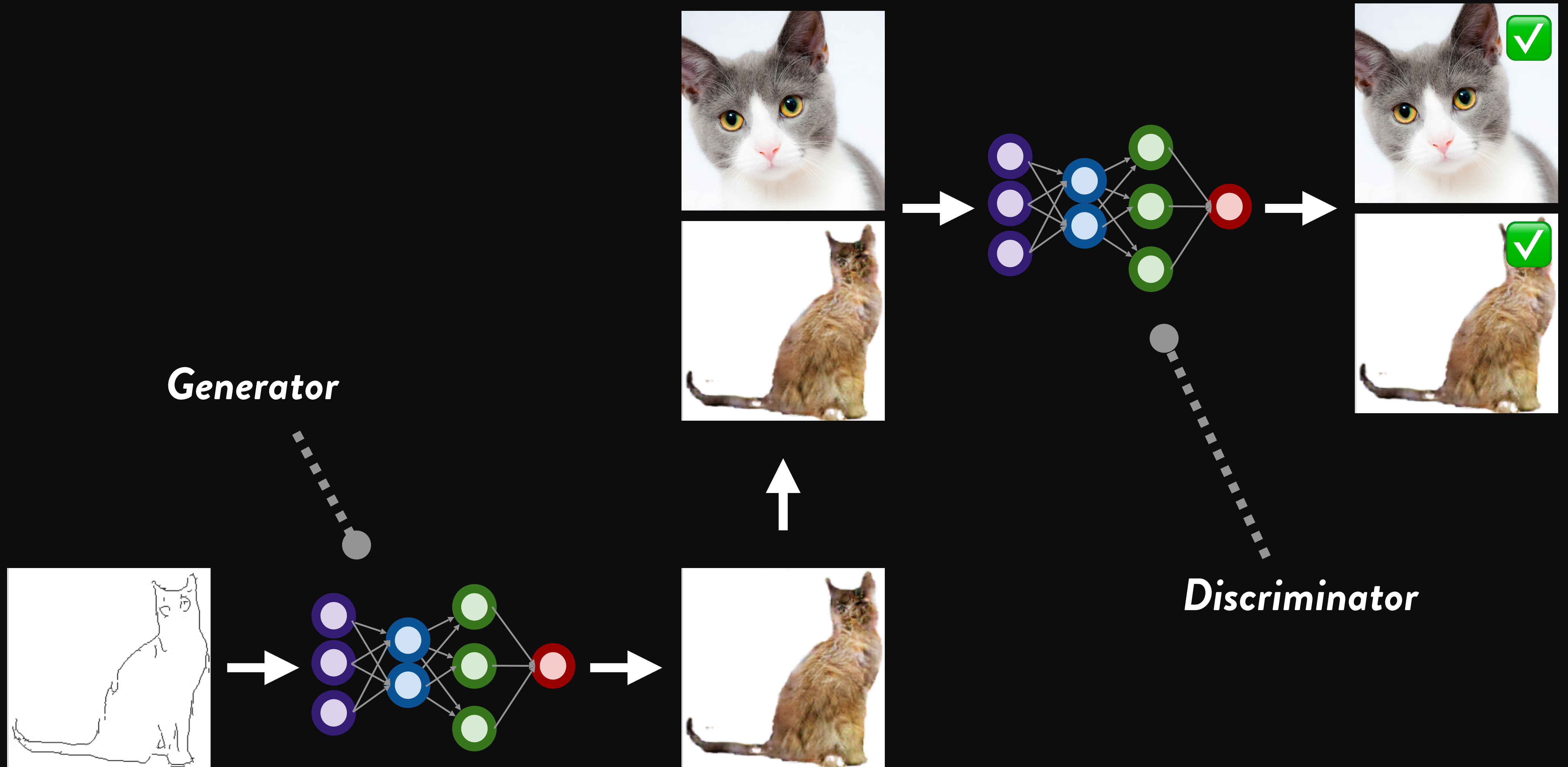


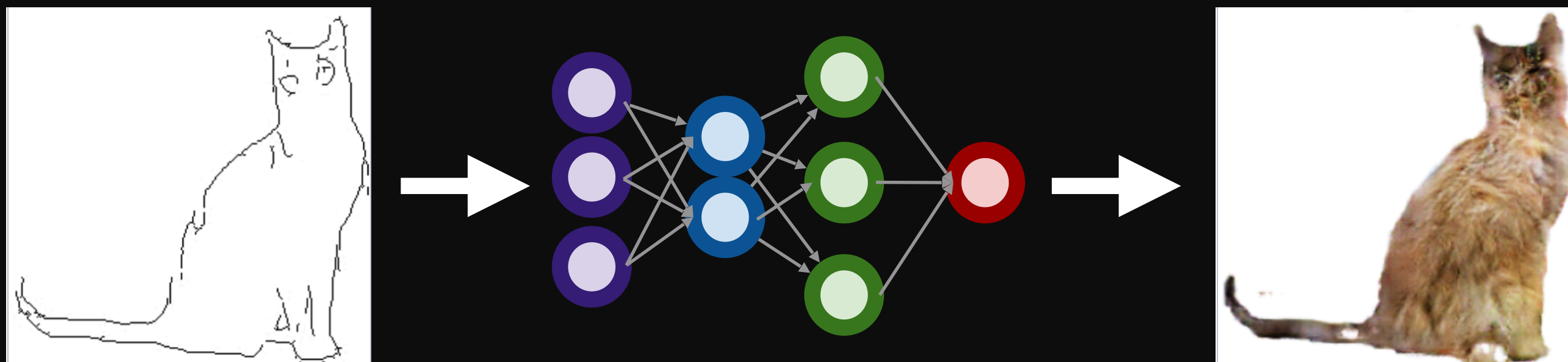
<https://zaidalyafeai.github.io/pix2pix/cats.html>

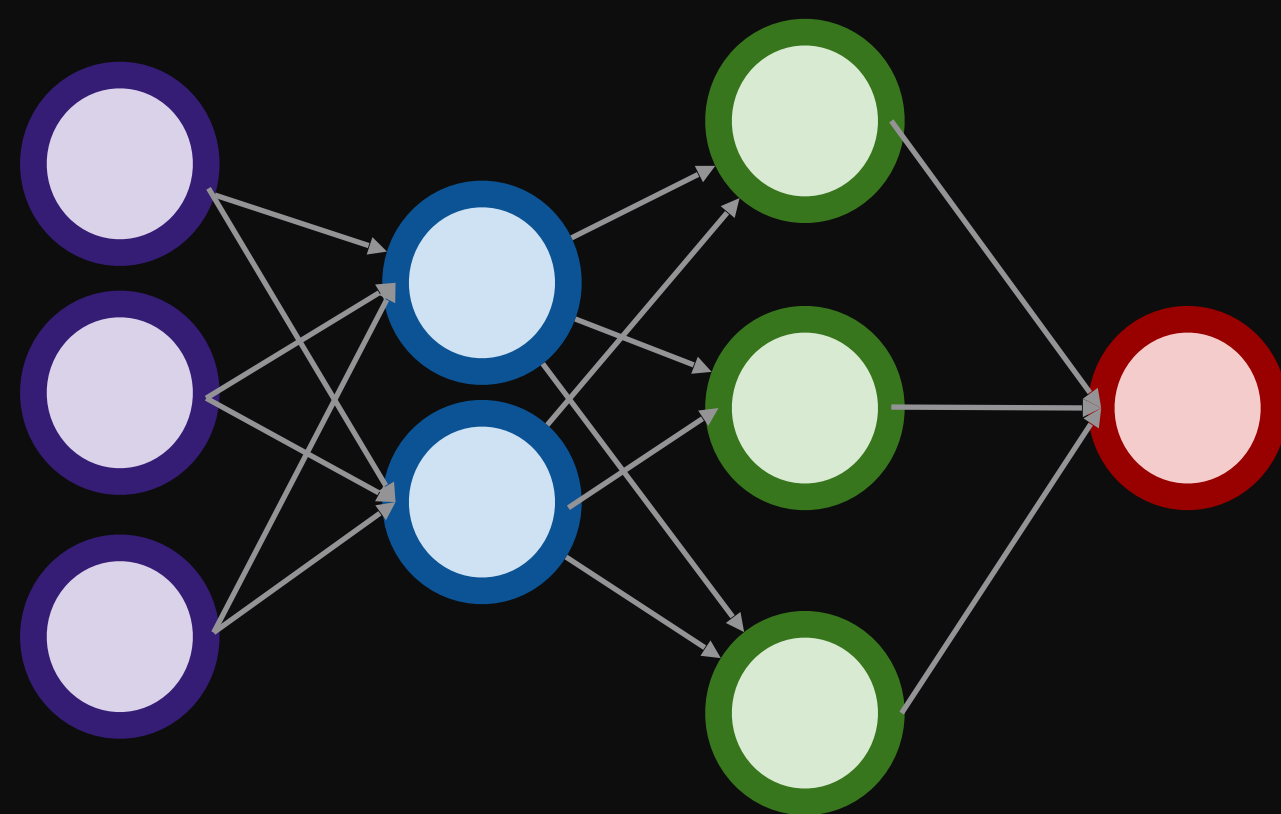
@jawache

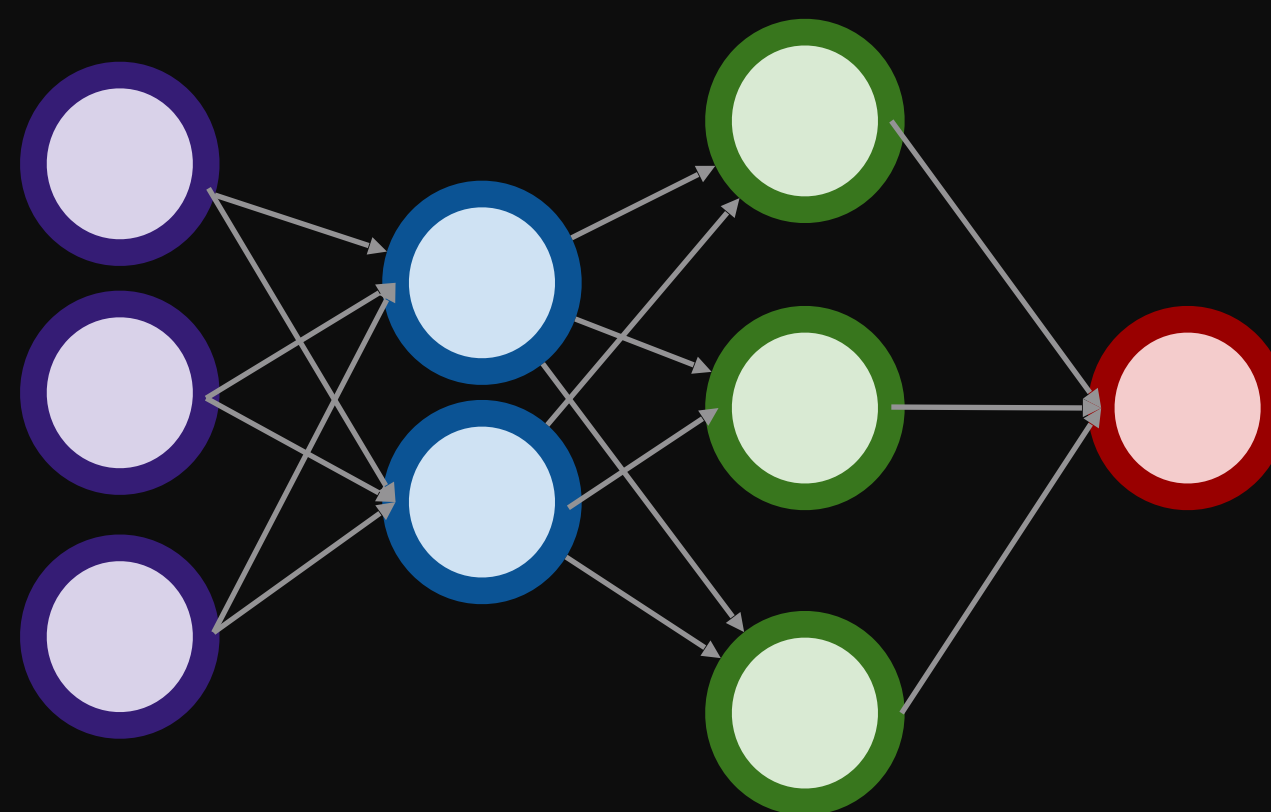
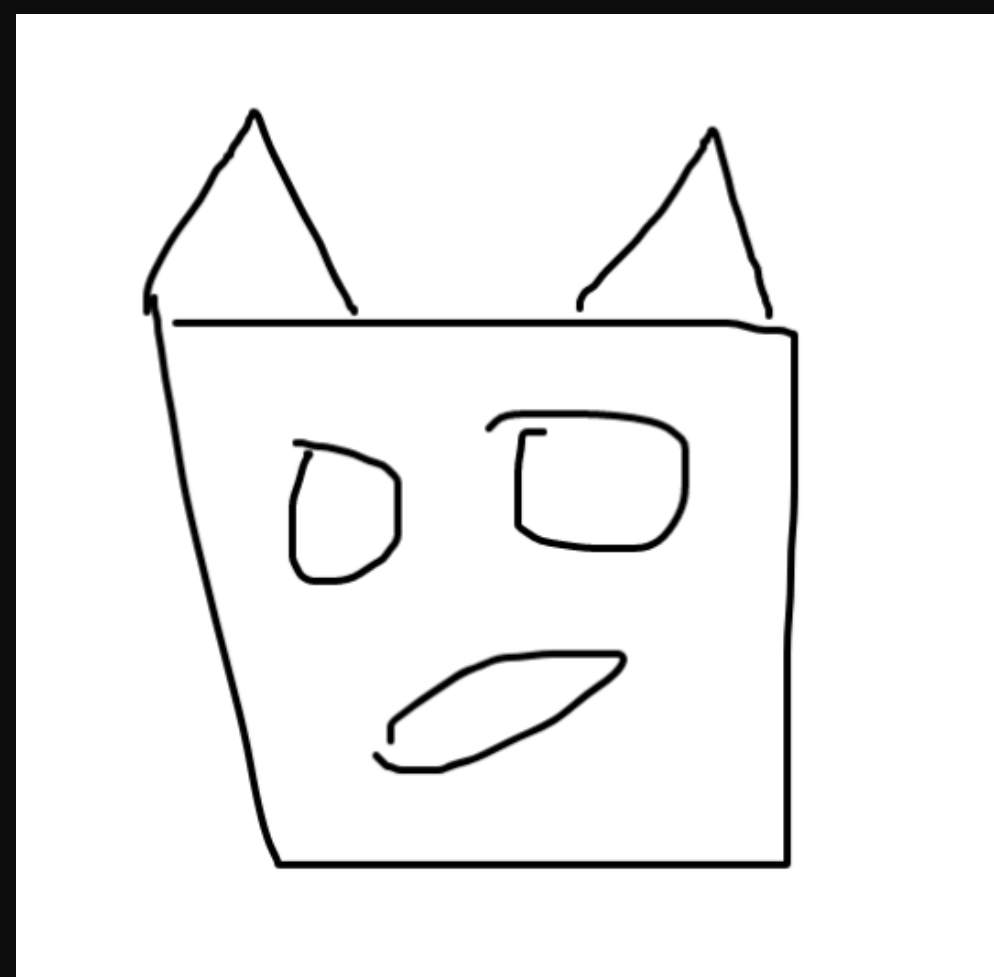












Edge-to-Face Results



<https://github.com/NVIDIA/vid2vid>

@jawache

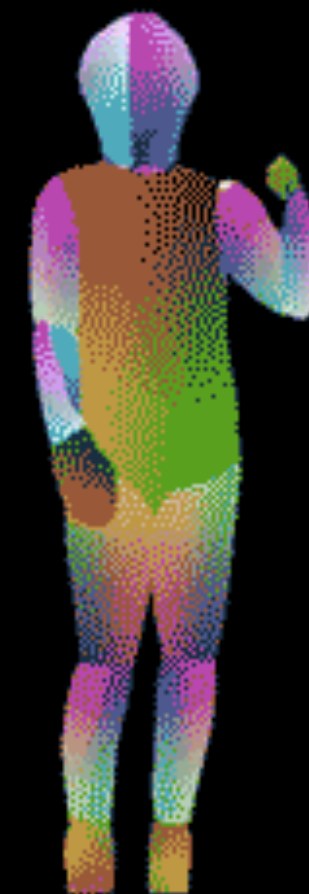
Multiple Outputs for Edge-to-Face



<https://github.com/NVIDIA/vid2vid>

@jawache

Pose-to-Body Results



<https://github.com/NVIDIA/vid2vid>

@jawache

This flower has long thin yellow petals and a lot of yellow anthers in the center

Stage-I

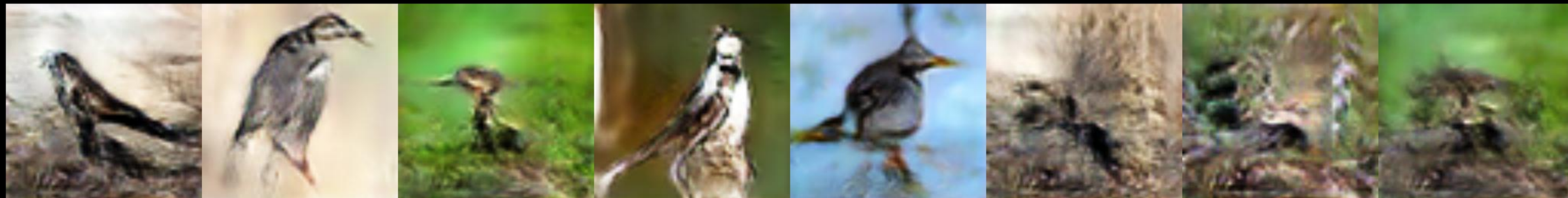


Stage-II



This bird is white, black, and brown in color, with a brown beak

Stage-I



Stage-II



Summary

Summary

- GANs learn to generate new images
- They take a lot of compute to train
- But the generator model can be run in the browser

The Mojifier



aka.ms/mojifier

@jawache



Asim Hussain

@jawache

codecraft.tv

microsoft.com