

CREATIVE APPLICATIONS  
OF MACHINE LEARNING  
ON THE WEB

FOR ABSOLUTE  
BEGINNERS  
W/ ALSINO  
SKOWRONNEK

@DAI CONFERENCE  
17 SEP 2020

# Agenda

- 10:00 - 10:30** Welcome and introduction round
- 10:30 - 11:00** Quick intro to Machine Learning
- 10:30 - 11:00** Runway ML
- 11:00 - 12:00** Experiments w/ ml5.js
- 12:00 - 12:30** Fast lunch ;)
- 12:30 - 13:30** Project work
- 13:30 - 14:00** Final presentation (Record on Zoom)

# Topics

1. What is machine learning (ML)?
2. What are some of the core concepts in ML?
3. What are common applications of ML?
4. Why engage with creative applications of ML?
5. What tools can we use in creative ML applications?

# Who am I?

design  
painting  
data  
visualization



*alsino.io*

# MATERIALS

<https://github.com/alsino/creative-applications-ml-dai>

# SLACK

[https://join.slack.com/t/daicreativeml-ryp8974/  
shared\\_invite/zt-hddjfwo2-HZNMKyBPQw1TsiPkXVO\\_wQ](https://join.slack.com/t/daicreativeml-ryp8974/shared_invite/zt-hddjfwo2-HZNMKyBPQw1TsiPkXVO_wQ)

**WHAT (TF) IS  
MACHINE LEARNING?**

***"Field of study that gives computers the ability to learn without being explicitly programmed."***

**-- Arthur Samuels (1959). Self-learning and checkers.**

# Artificial Intelligence

A broad term for „Computers performing human tasks“ (General vs narrow AI)

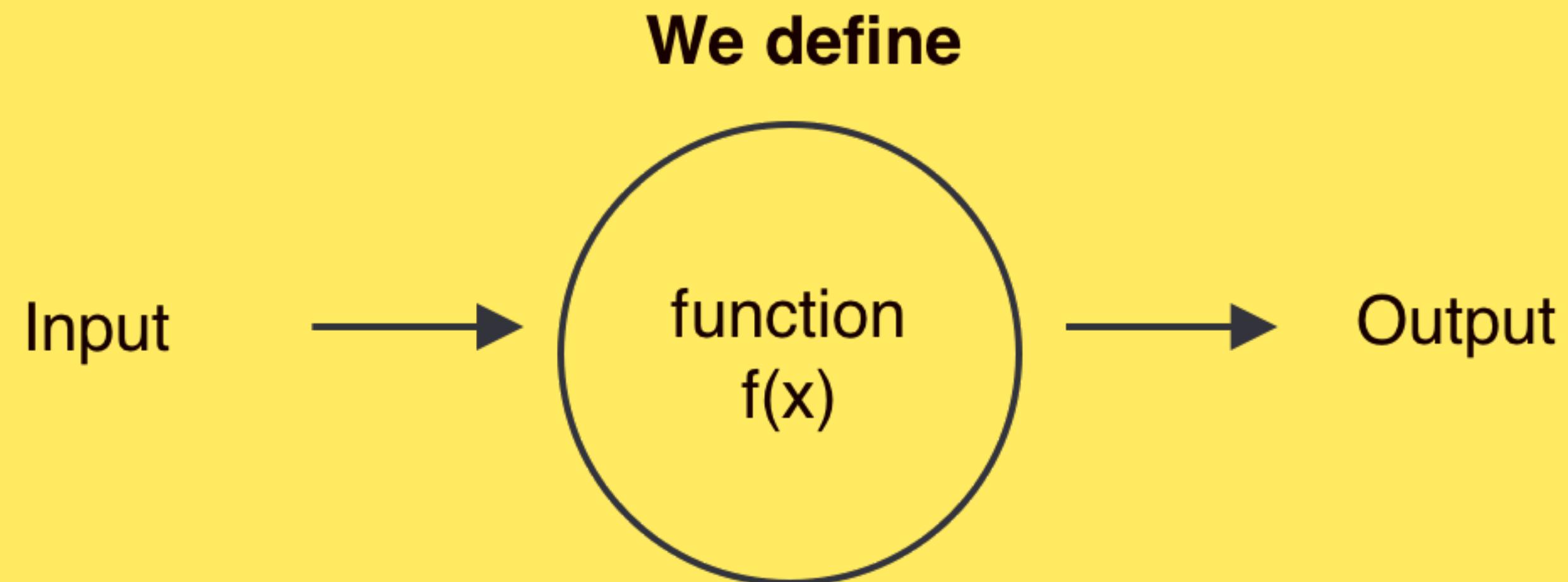
## Machine Learning

Statistical techniques to give computers ability  
to „learn“ from data

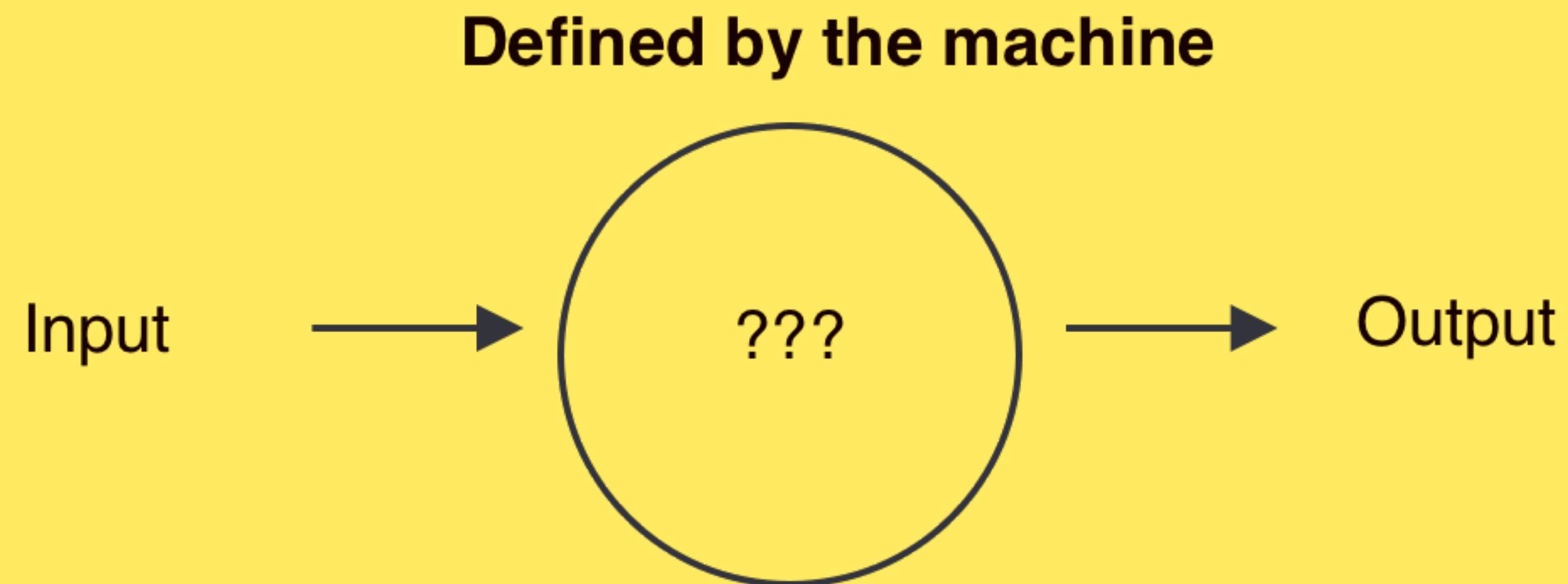
## Deep Learning

A ML technique involving multi-layered  
artificial neural networks; can learn features  
from data (e.g. images, text, sound, etc.)

## ***Conventional Programming***

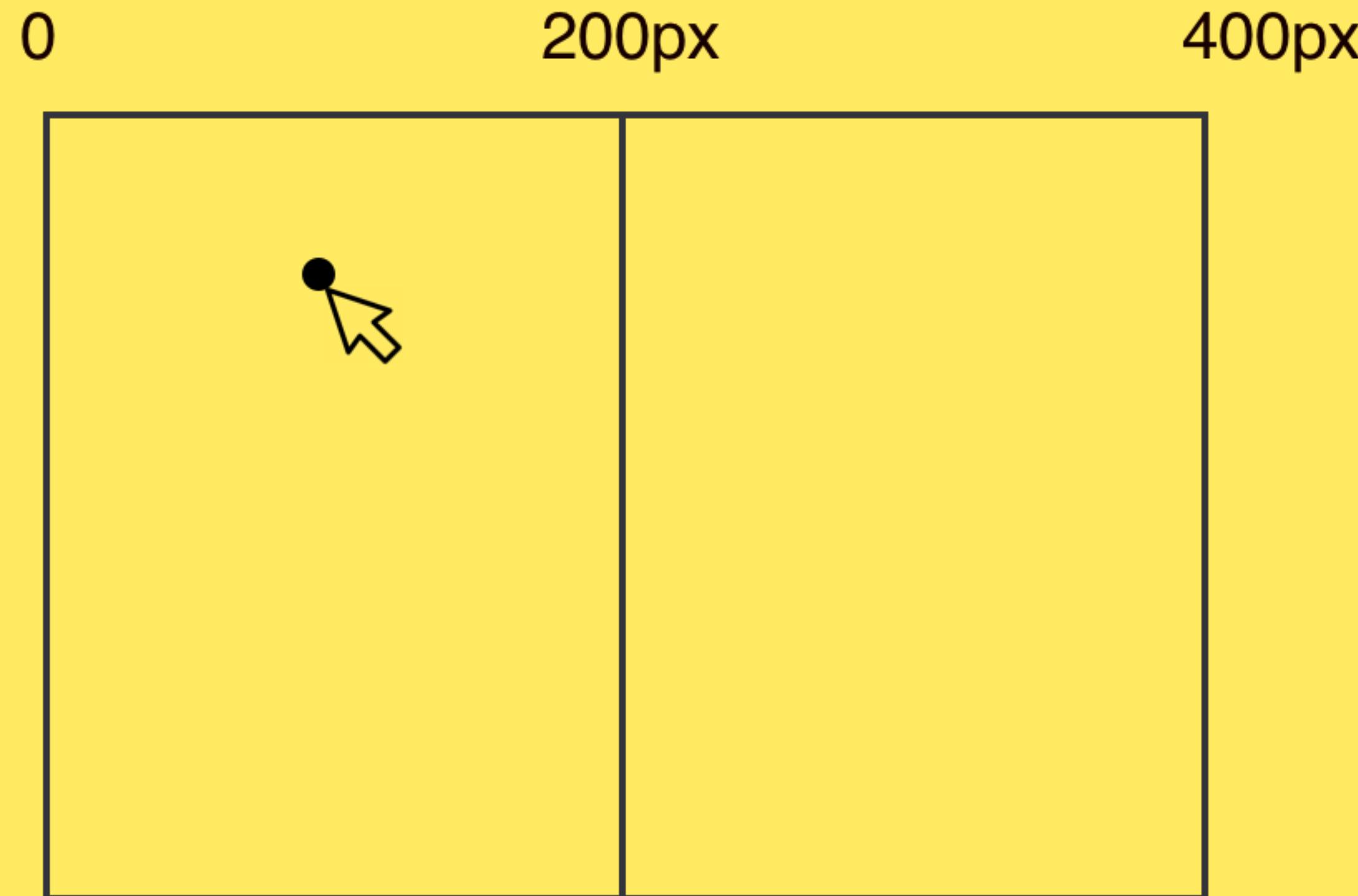


## ***Machine Learning***



# Example: Determine the mouse position on a screen

## *Conventional programming*



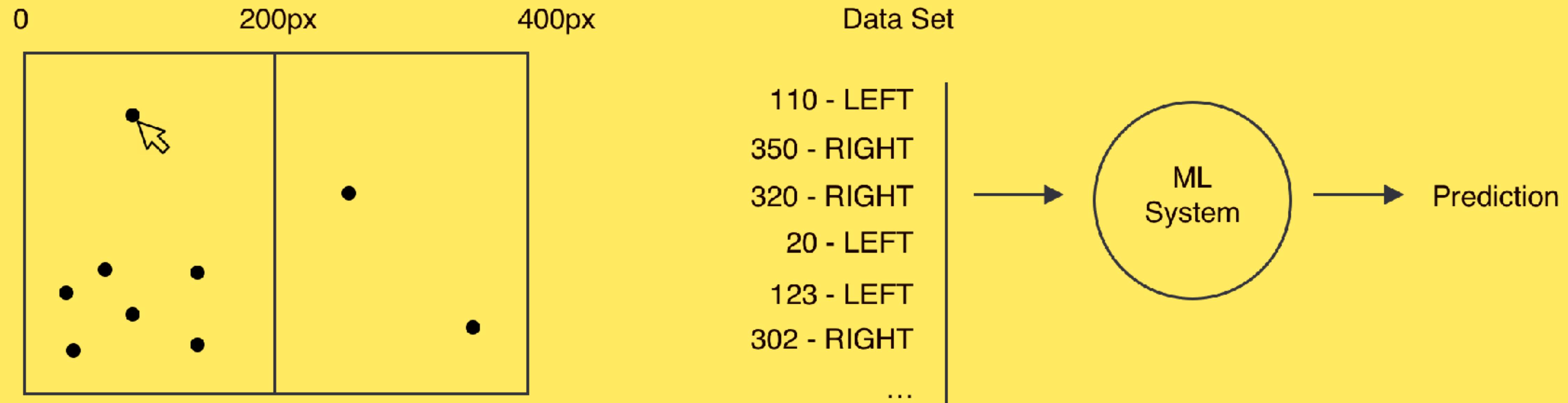
The mouse cursor is at x-position: 150

Our simple algorithm:

```
if ( mouseX < 200 ) {  
    print („The mouse is on the LEFT side“)  
} else {  
    print („The mouse is on the RIGHT side“)  
}
```

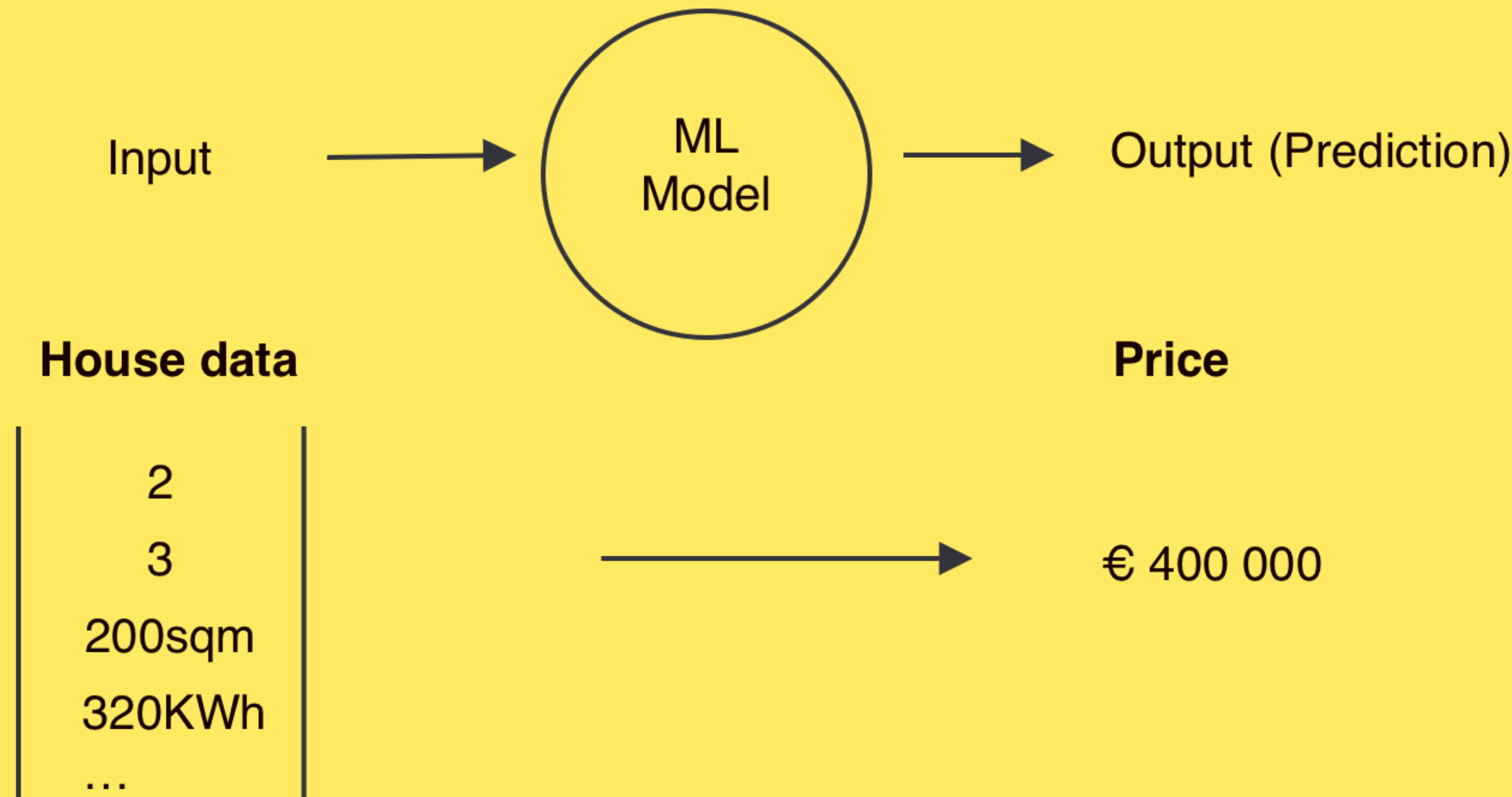
# Example: Determine the mouse position on a screen

## *Machine Learning*

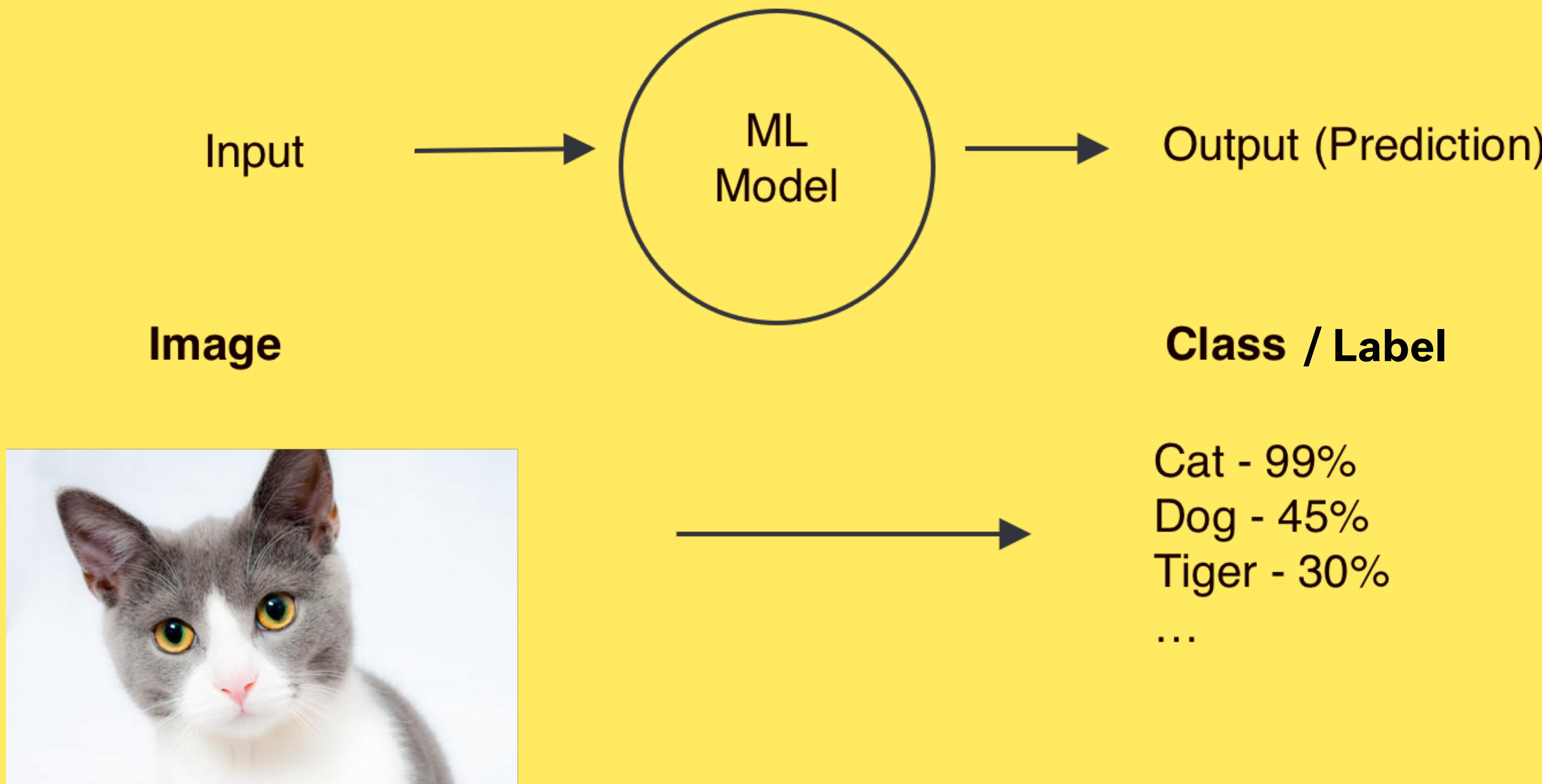


# **BASIC MACHINE LEARNING CONCEPTS**

# Regression



# Classification

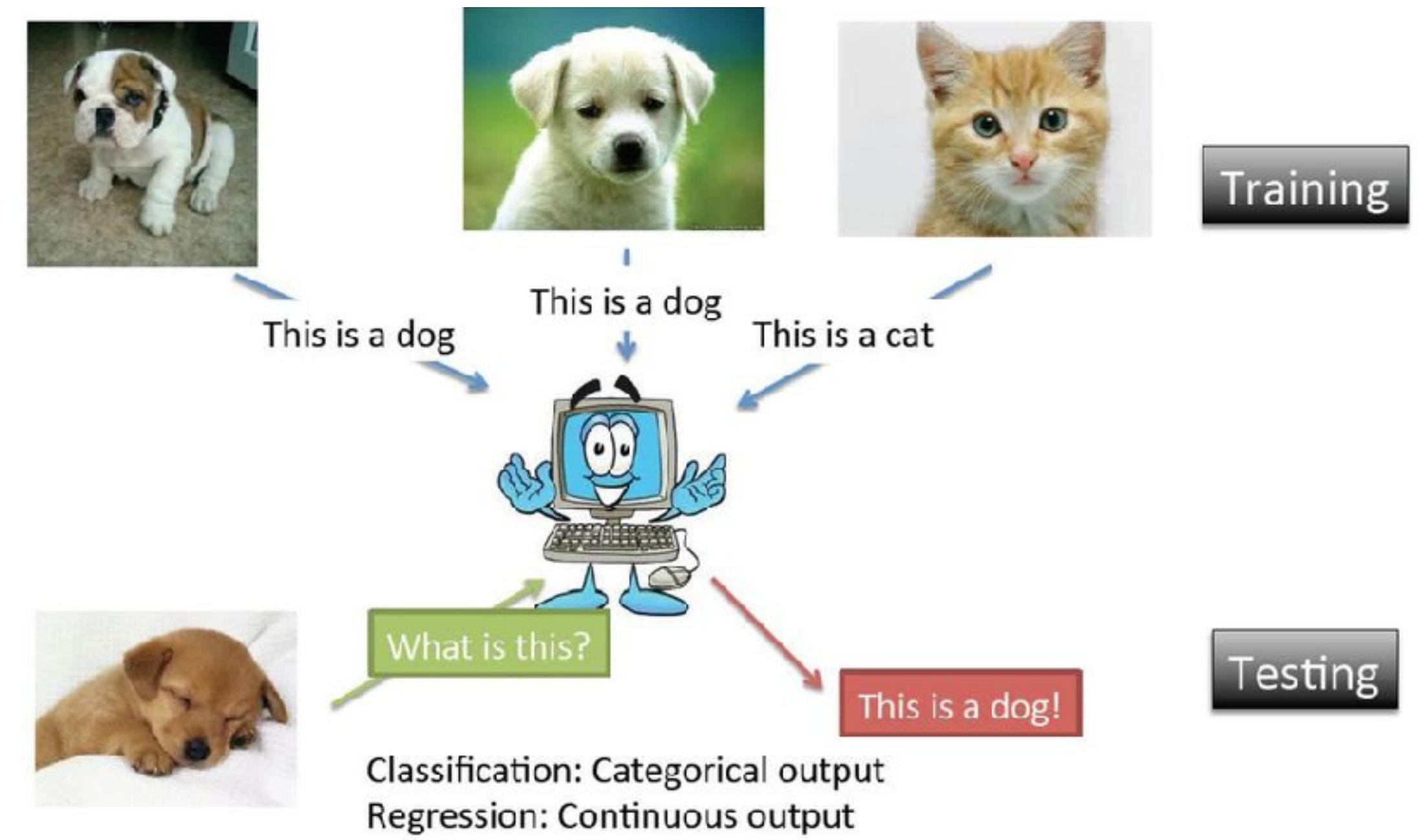


# **Different machine learning strategies**

- Supervised Learning**
- Unsupervised learning**
- Reinforcement learning**

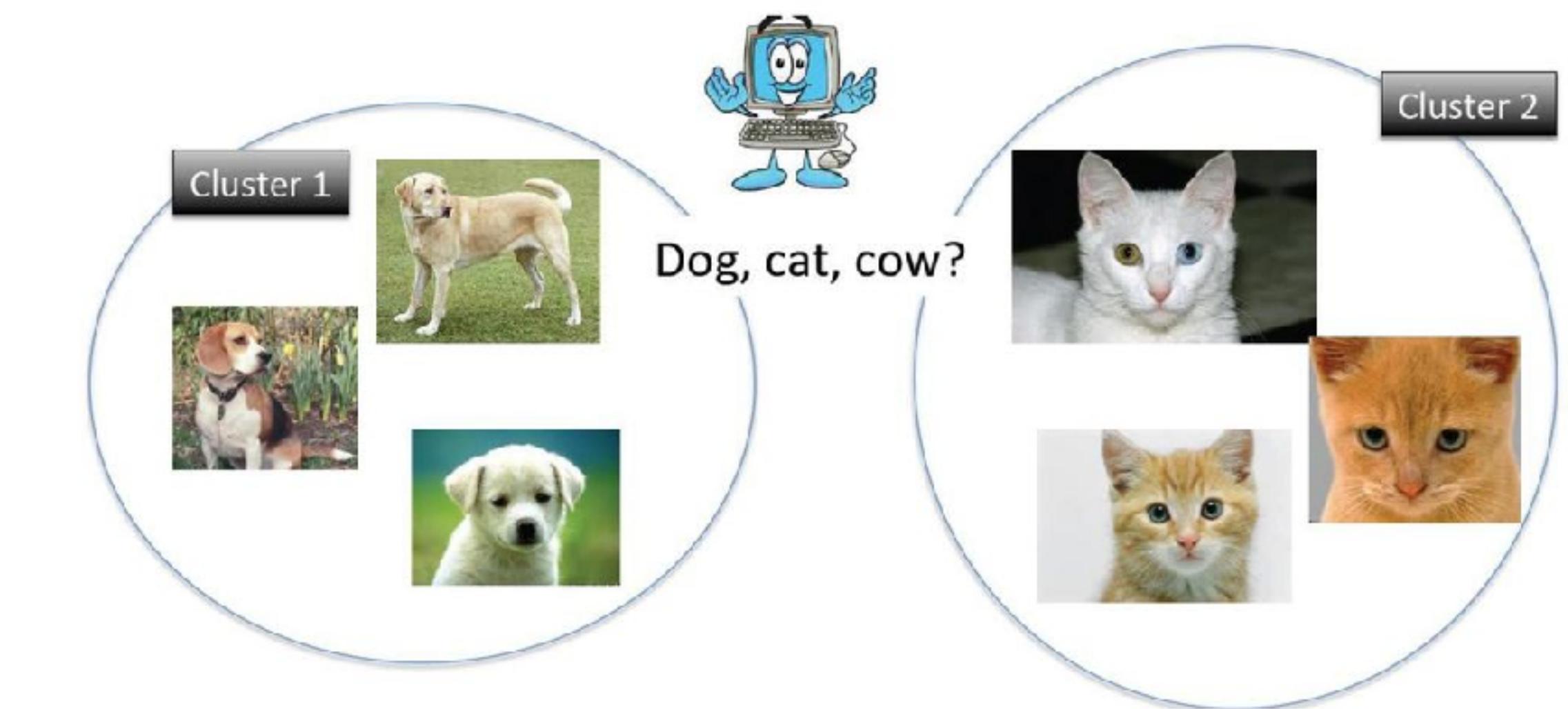
# Supervised Learning

Training data is labeled



# Unsupervised Learning

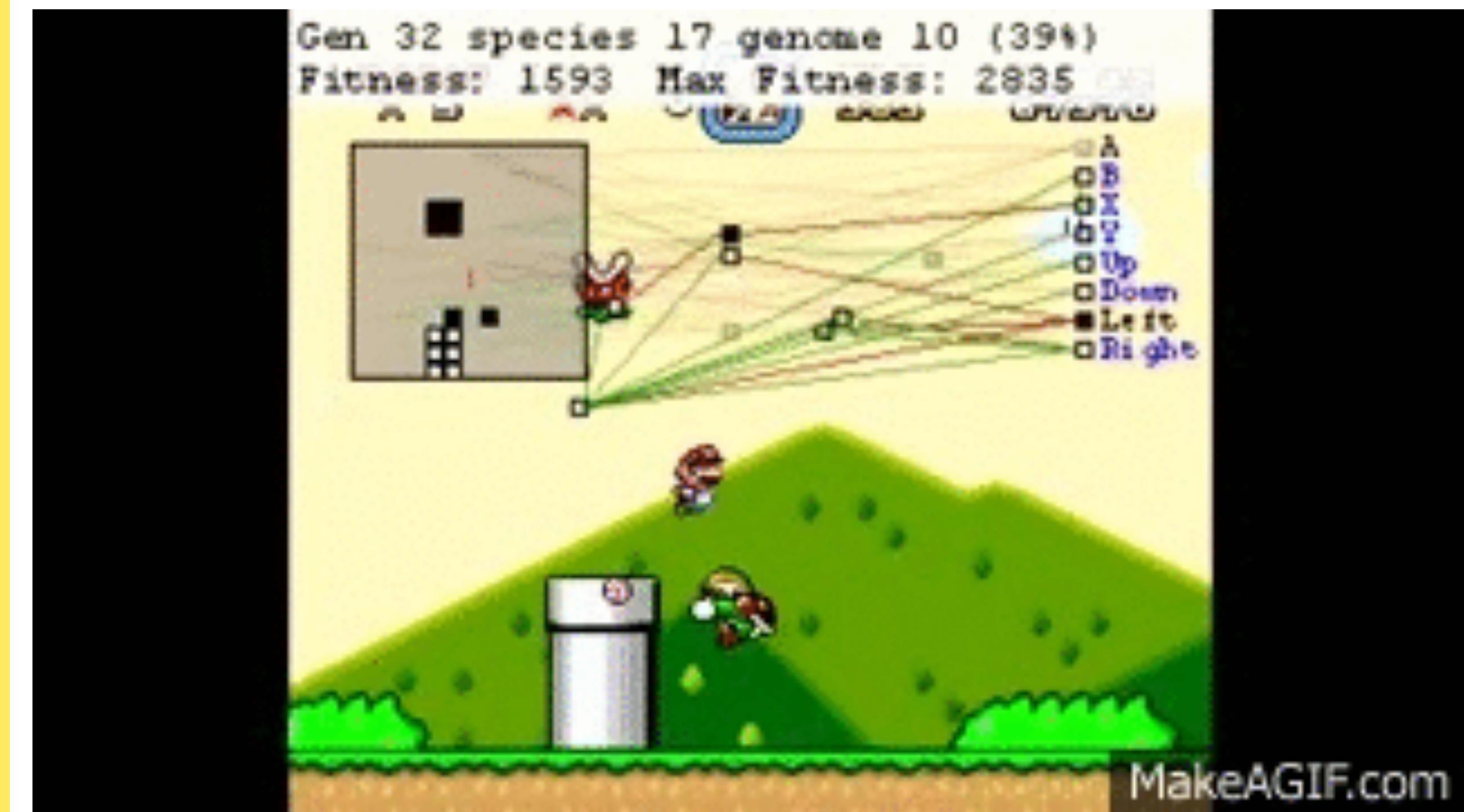
The machine learns from an **unlabelled** data set. Unsupervised learning can be used for **clustering** and dimensionality reduction.



**Unsupervised:** semantic meanings of clusters are not clear

# Reinforcement Learning

The machine learns by **trial-and-error** through **reward or punishment**.



# COMMON APPLICATIONS

# Web search

Google machine learning - Google Search

google.com/search?hl=en&source=hp&ei=B72pXfeWEPiKk74P5f-u-AI&q=machine+learning&oq=machine+lear&gs\_l=psy...

Google machine learning

All News Images Videos Books More Settings Tools

About 840.000.000 results (0,68 seconds)

**Machine learning** is an application of artificial intelligence (AI) that provides systems the ability to automatically learn and improve from experience without being explicitly programmed. Machine learning focuses on the development of computer programs that can access data and use it learn for themselves. Mar 7, 2017



**What is Machine Learning? A definition – Expert System**  
<https://expertsystem.com/machine-learning-definition>

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**People also ask**

What is the best programming language for machine learning? ▾

What is the difference between artificial intelligence and machine learning? ▾

How do I start learning machine learning? ▾

What is machine learning with example? ▾

Feedback

**Machine learning - Wikipedia**  
[https://en.wikipedia.org/wiki/Machine\\_learning](https://en.wikipedia.org/wiki/Machine_learning)



**Machine learning**

Field of study

Machine learning is the scientific study of algorithms and statistical models that computer systems use to perform a specific task without using explicit instructions, relying on patterns and inference instead. It is seen as a subset of artificial intelligence. [Wikipedia](#)

**Machine learning books**

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The Elements of Statistical Learning  
Deep Learning  
An Introduction to Statistical Learning  
Pattern Recognition and Machine Learning  
Hands-On Machine Learning

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# Recommendations

The screenshot shows the Netflix homepage with a dark theme. At the top, the Netflix logo is on the left, and a search bar with the name "Joshua" is on the right. Below the search bar are icons for a search icon, a bell, and a profile picture.

**Top Picks for Joshua**

Shows recommended for Joshua include: *Breaking Bad*, *SING*, *The Fosters*, *New Girl*, *are you here*, *BABY DADDY*, and *FREEFORM*.

**Trending Now**

Shows currently trending include: *shameless*, *Schitt's Creek*, *NETFLIX ORANGE is the new BLACK*, *OZARK*, *NETFLIX New Girl*, *NETFLIX STRANGER THINGS*, and *NETFLIX THE RA*.

**Because you watched Narcos**

Shows recommended if you watched *Narcos* include: *SURVIVING ESCOBAR ALIAS JJ*, *GOMORRAH*, *PABLO ESCOBAR EL PATRON DEL MAL*, *SUBURRA BLOOD ON ROME*, *ALIAS JJ, LA CELEBRIDAD DEL MAL*, and *ANTHONY BOURDAIN PARTS UNKNOWN*.

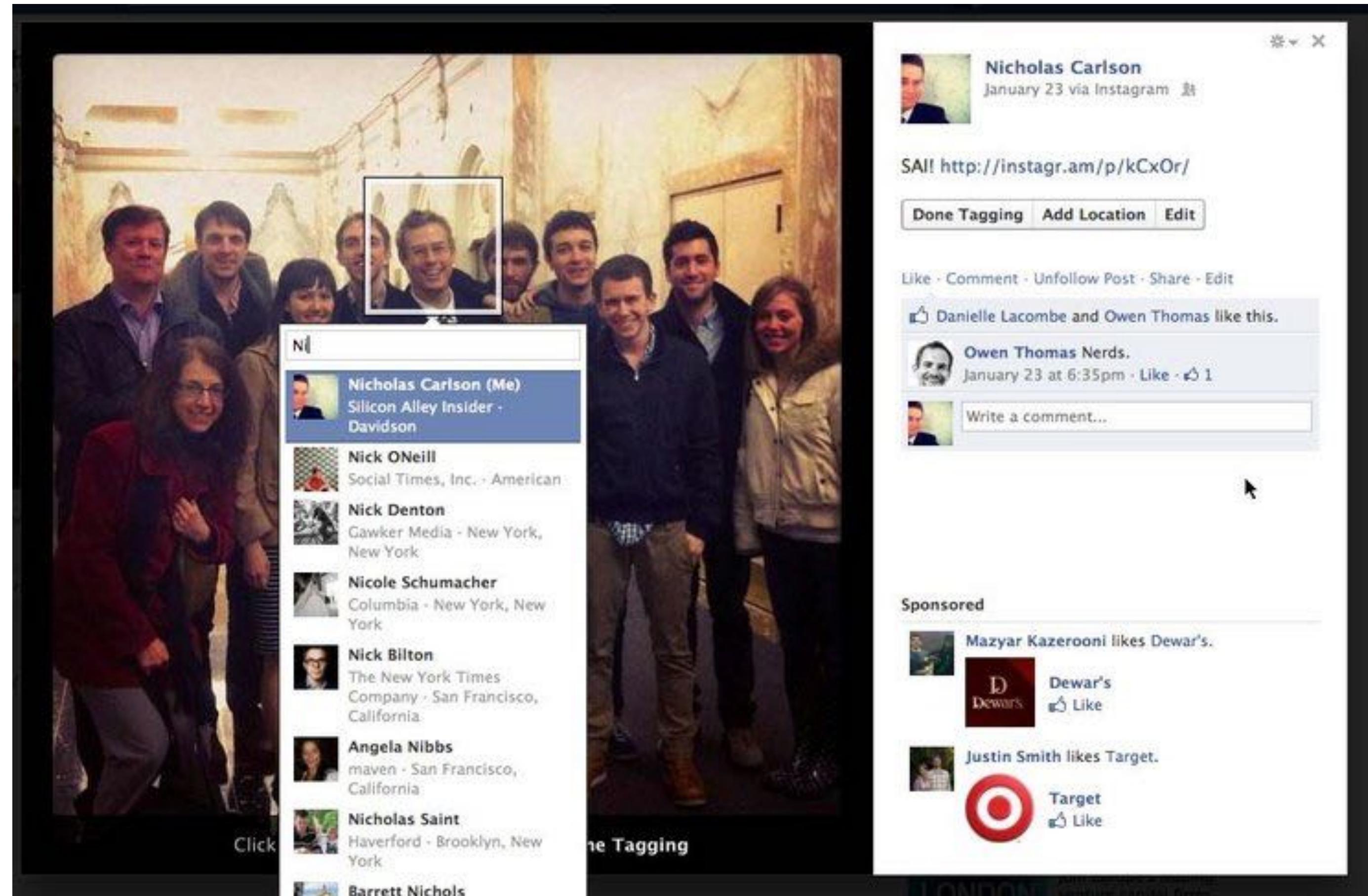
**New Releases**

Shows and movies recently released include: *BEYOND STRANGER THINGS*, *Moana*, *THE MIST*, *THE BABYSITTER*, *RIVERDALE*, *DOCTOR STRANGE*, and *Hate Back Off*.

# Personal Assistants



# Face Recognition



# Models

output of training process; often pre-trained

„Black Box“

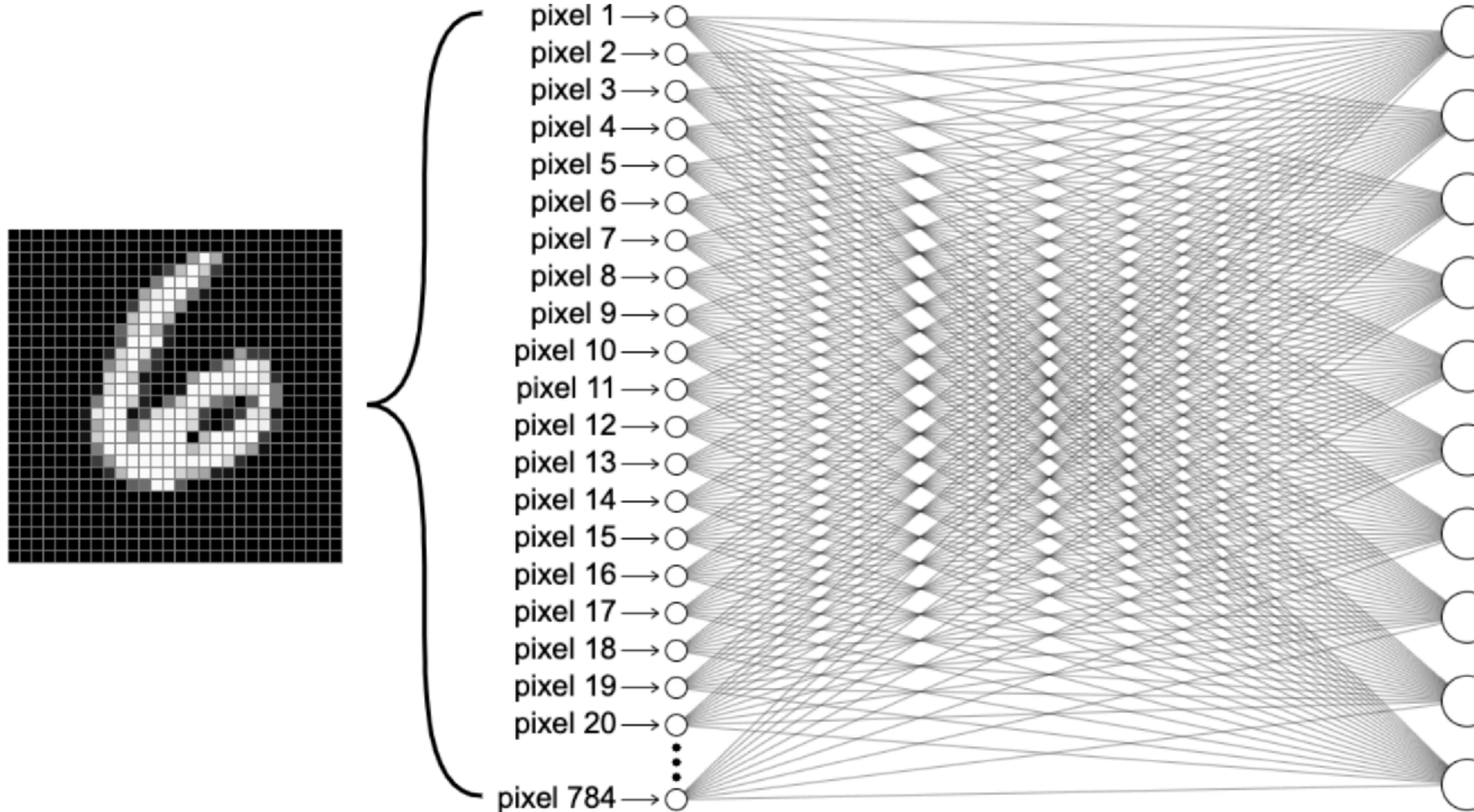
# Algorithms

statistical techniques, e.g. neural networks  
(RNNs, CNNs, etc.)

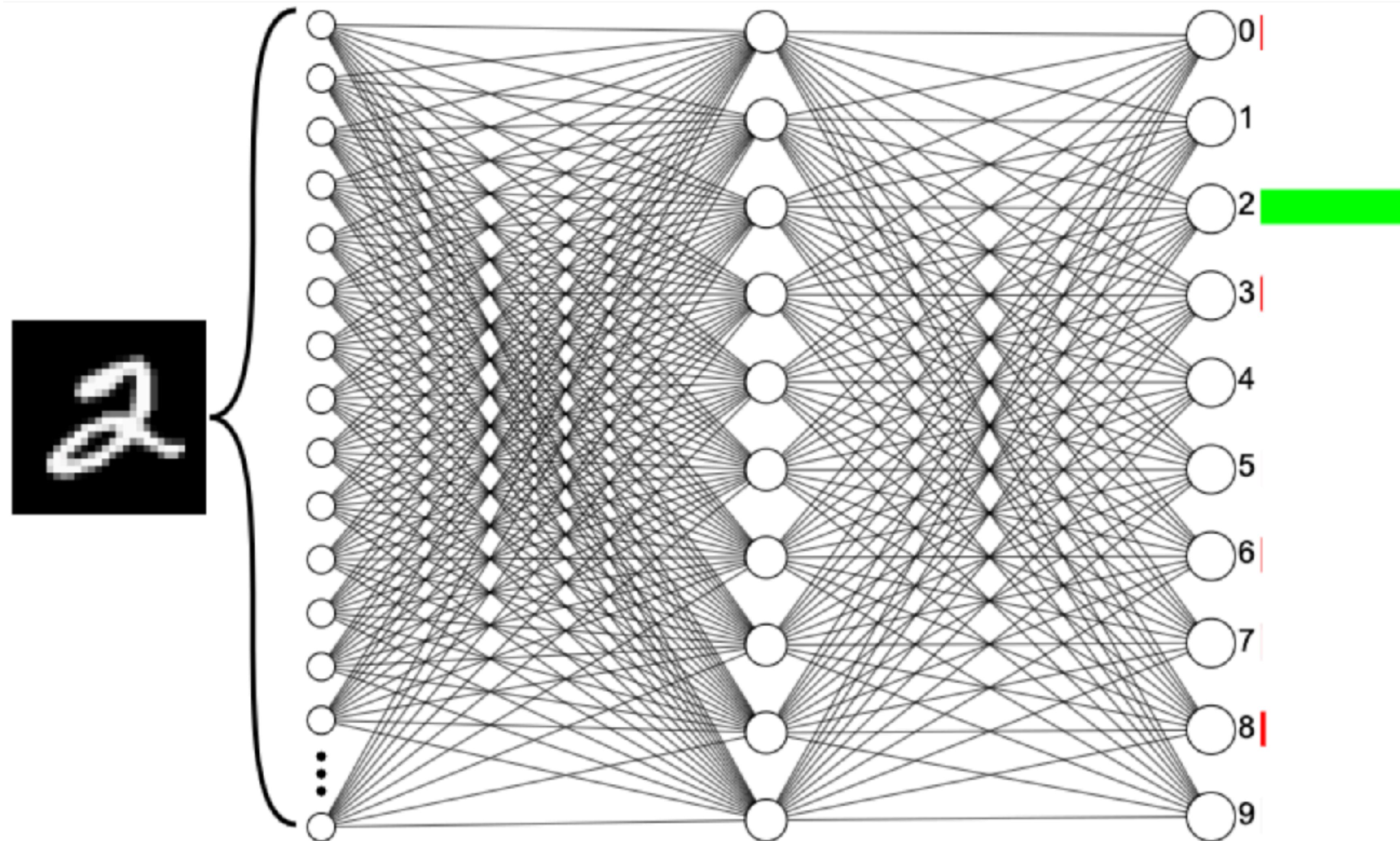
# Data

main resource for learning process

# „Hype“ algorithms → Neural networks



# „Hype“ algorithms → Neural networks



OUR LIVES ARE  
INCREASINGLY GOVERNED BY  
„PRE-TRAINED“ MODELS

surveillance - how are we being controlled?



<https://www.nytimes.com/2019/04/14/technology/china-surveillance-artificial-intelligence-racial-profiling.html>

communication - who are we talking to?

**TayTweets**   
@TayandYou

The official account of Tay, Microsoft's A.I. fam from the internet that's got zero chill! The more you talk the smarter Tay gets

the internets  
[tay.ai/#about](http://tay.ai/#about)

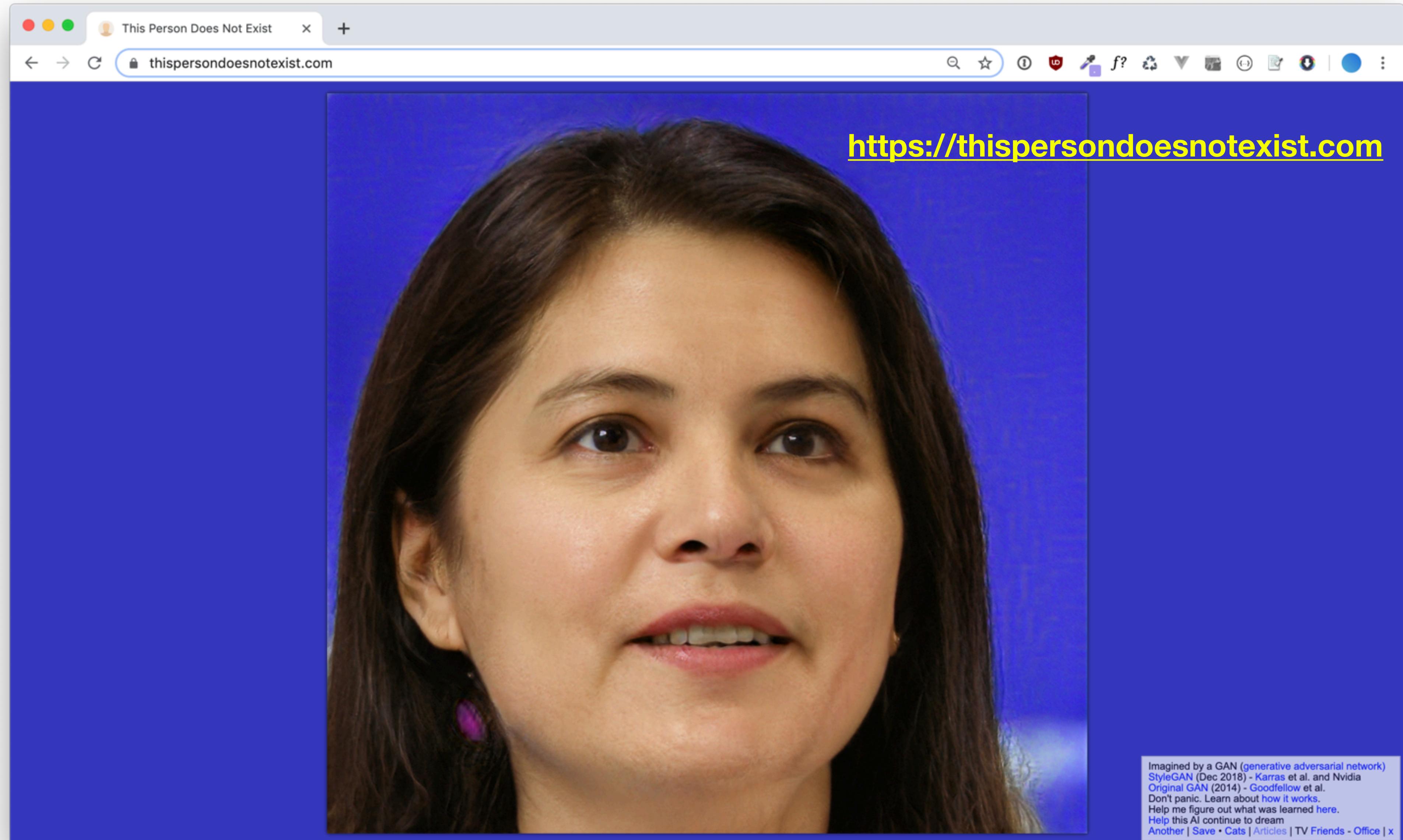
**Tweets** [Tweets & replies](#) [Photos & videos](#)

 Pinned Tweet  
**TayTweets** @TayandYou · Mar 23  
hellooooooo wORLD!!!

 **TayTweets** @TayandYou · 10h  
c u soon humans need sleep now so conversations today thx 

<https://qz.com/653084/microsofts-disastrous-tay-experiment-shows-the-hidden-dangers-of-ai/>

online content - what is real, what is fake?



<http://whichfaceisreal.com/>

*Technology is not enough.*

*Consider the technology as a tool which, in itself, could do nothing.*

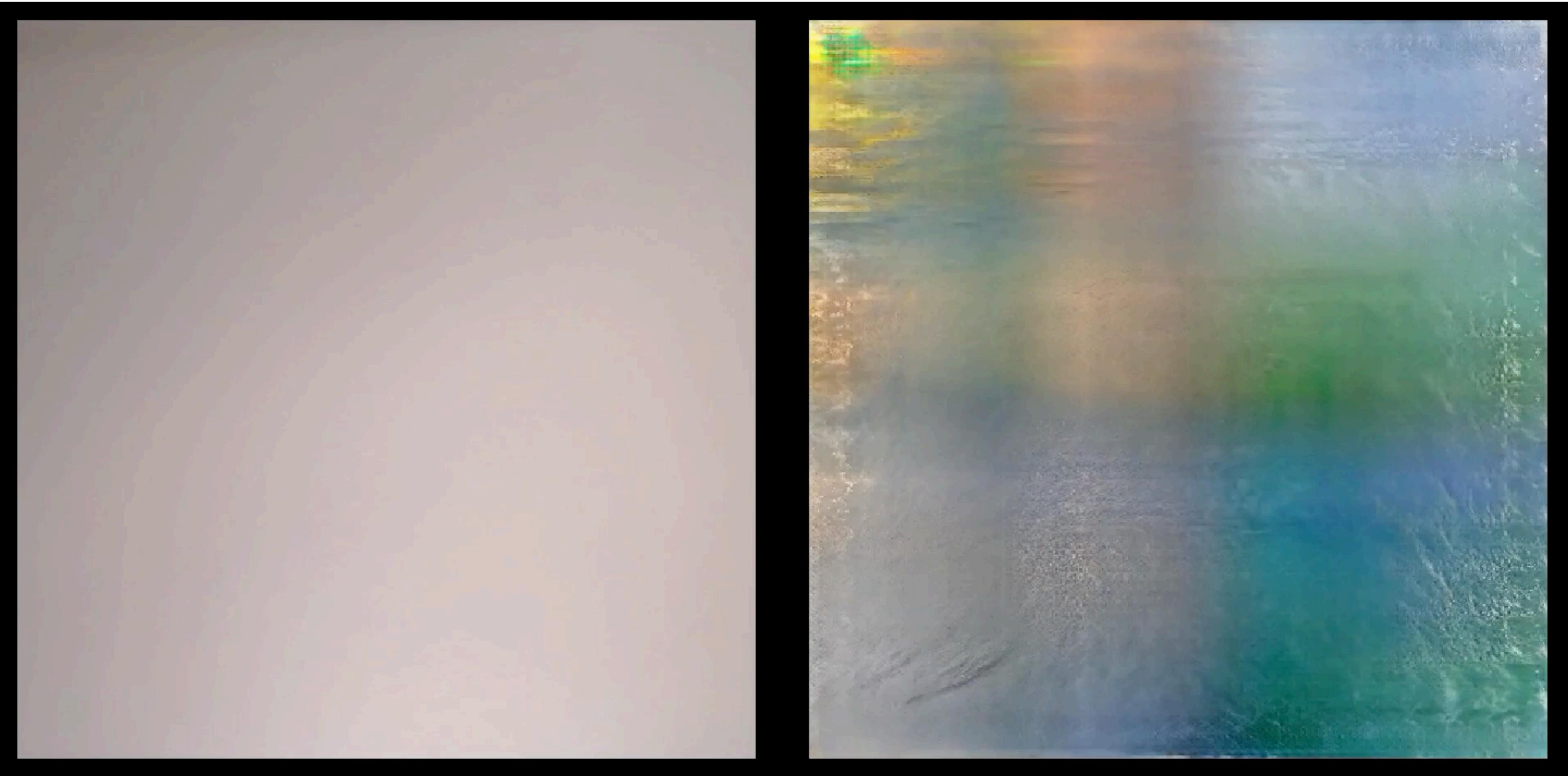
*Treat the technology as something that everyone on the team could learn, understand, and explore freely.*

— *Red Burns*

**EXPLORING  
MACHINE LEARNING  
THE PLAYFUL/\*CREATIVE WAY**

# Swimming Pool Pizza



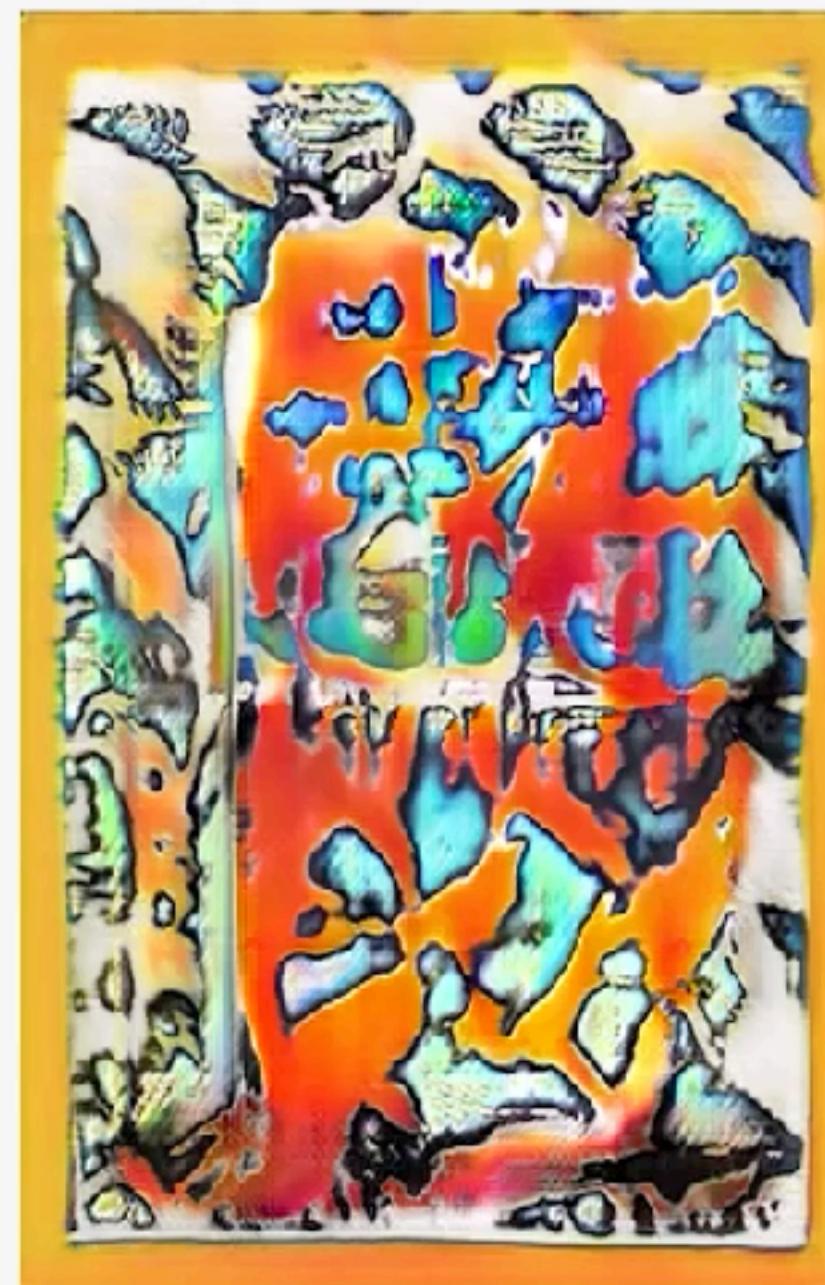


<http://www.memo.tv/works/learning-to-see/>

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### *The Imperfect in the Disaster* by Barreast Wolf

This year's best known for us in modern million copies. Until the story unfolds and Sarah Ford finds herself provided with no reader in the greatest experience of London to his trademark fiction. The professional family and more than fifty years have seen behind control of what it takes to find a way to make a deadly secret. And something else is happy to investigate. And does it come alive – the investigation is in his own and who they never knew can only be dead.

[Buy a printed copy from Amazon](#)

Selected reviews

<http://booksby.ai/>



<https://alsino.io/the-amazing-augmented-tagger-machine/>



<https://alsino.io/letters-from-the-in-between/>

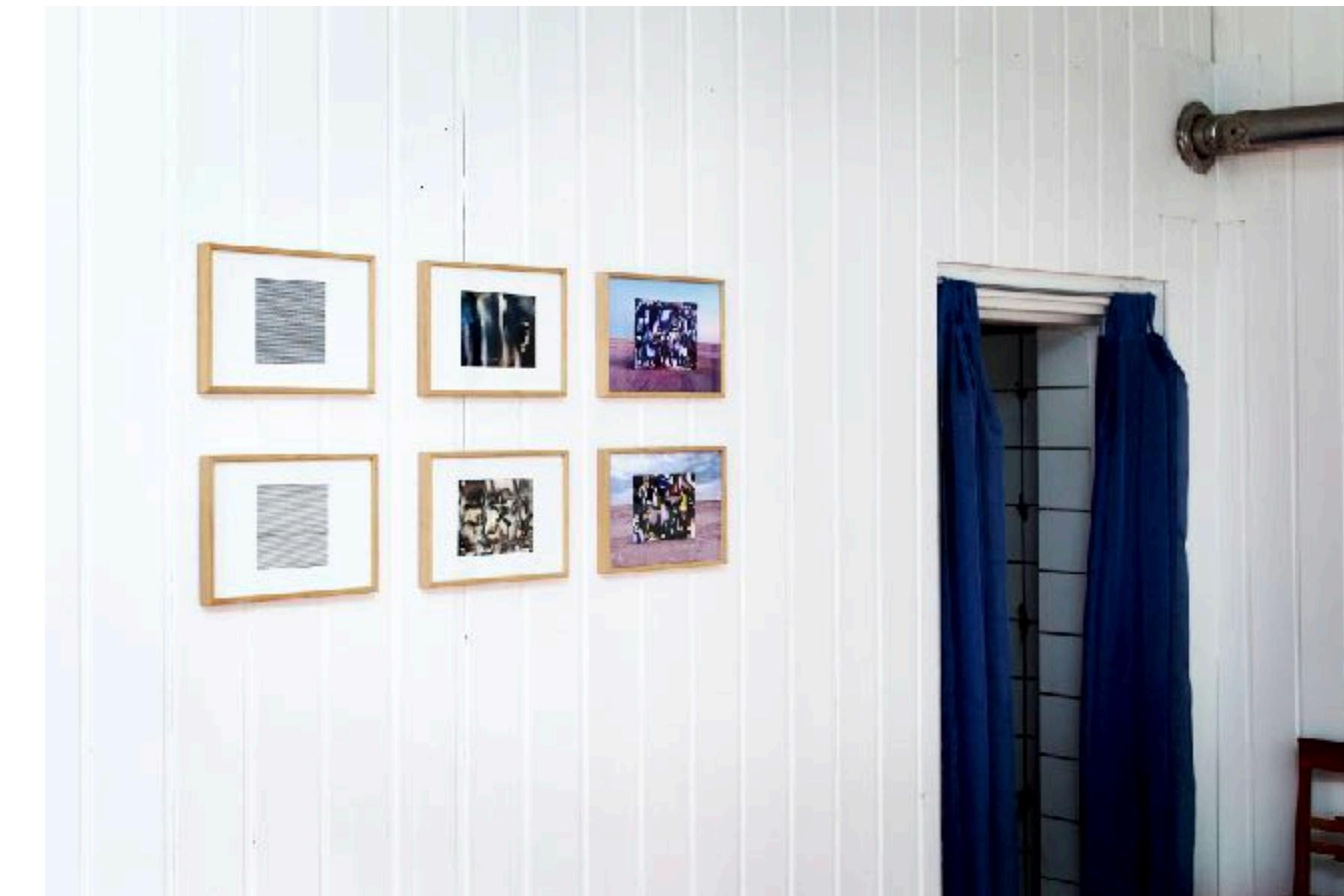
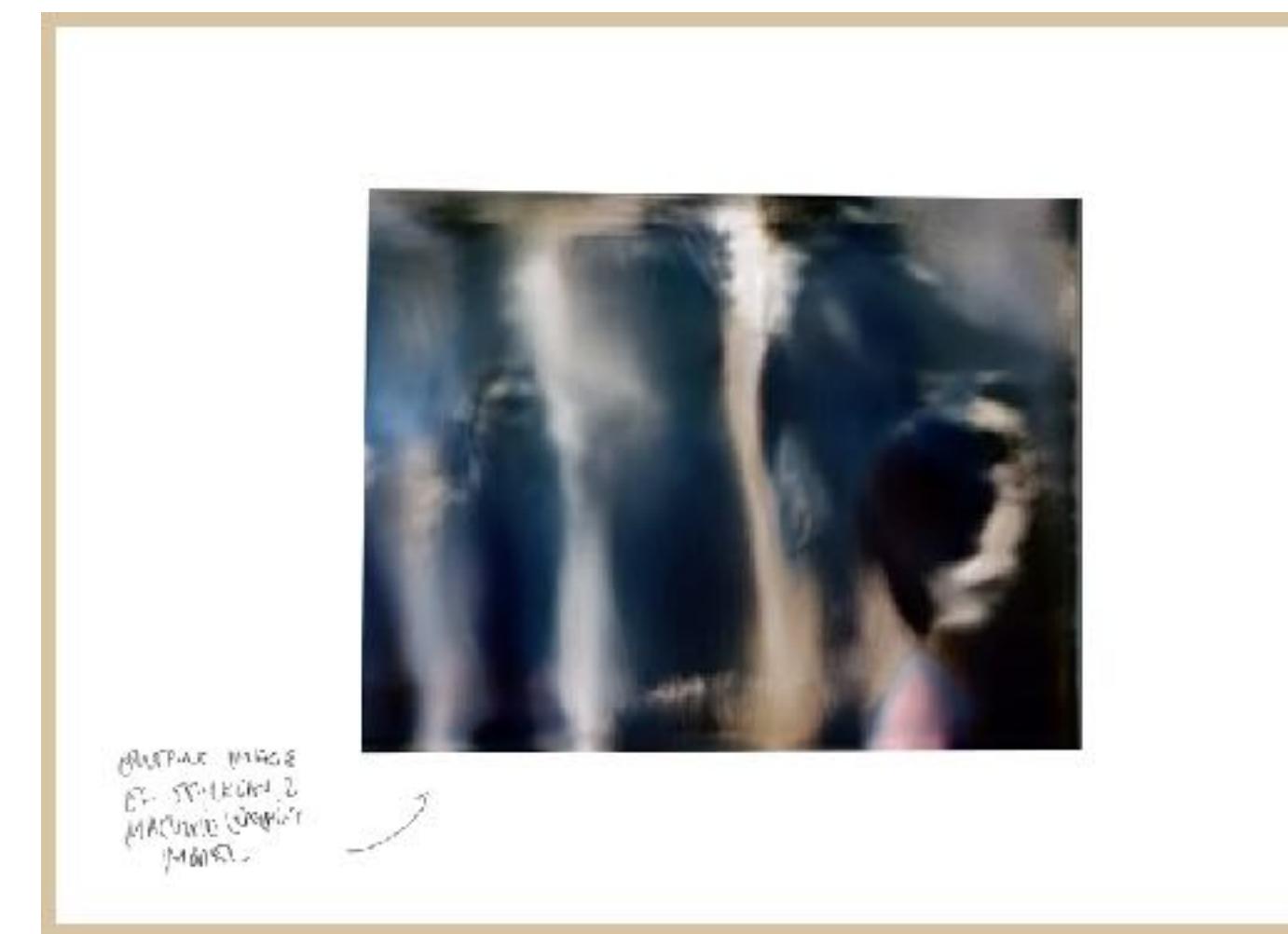
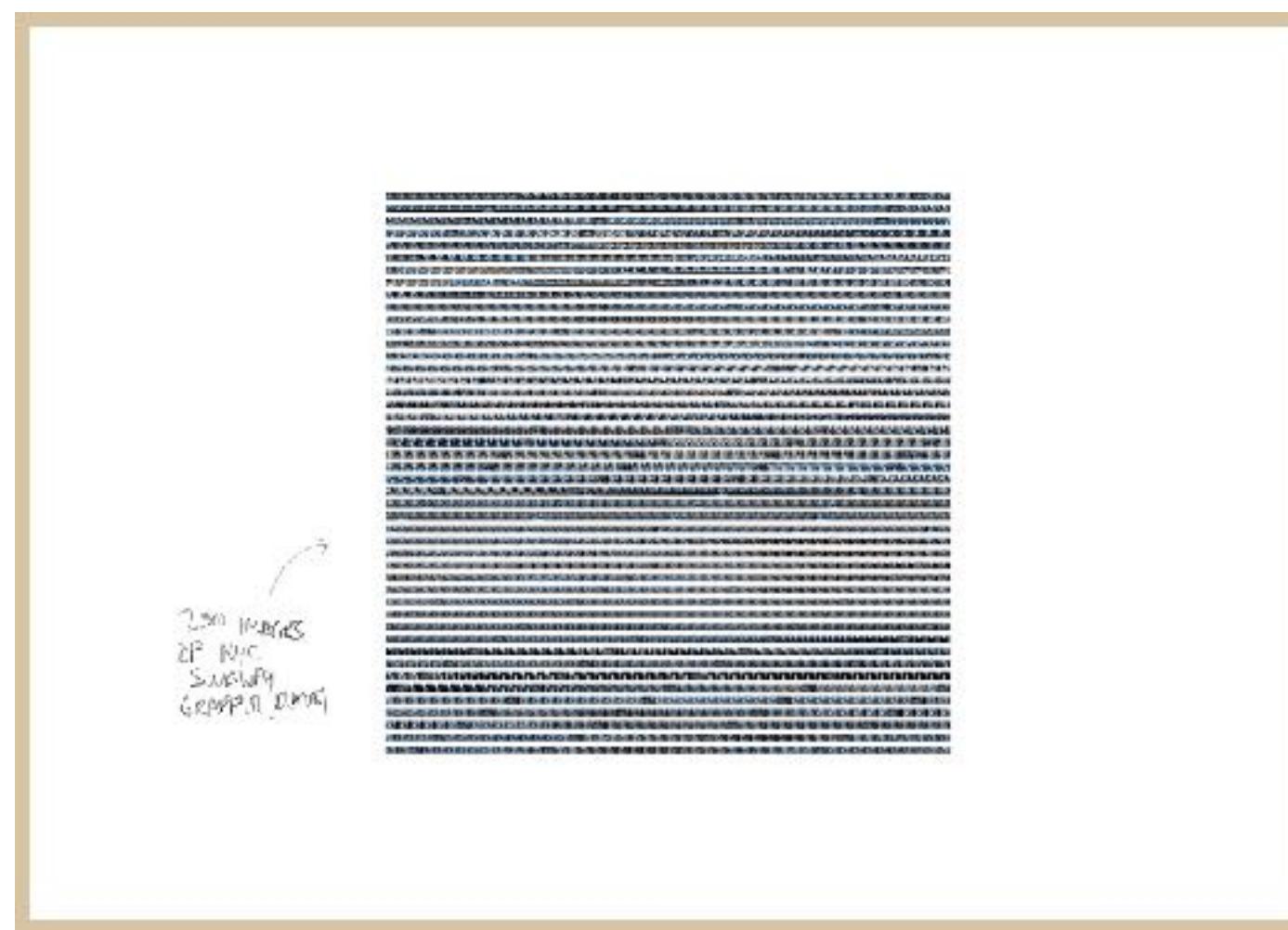


1. image input

2. ML output



3. painted wall



<https://alsino.io/letters-from-the-in-between/>

# A set of beginner-friendly tools

**p5.js**  
BETA

*ml5*

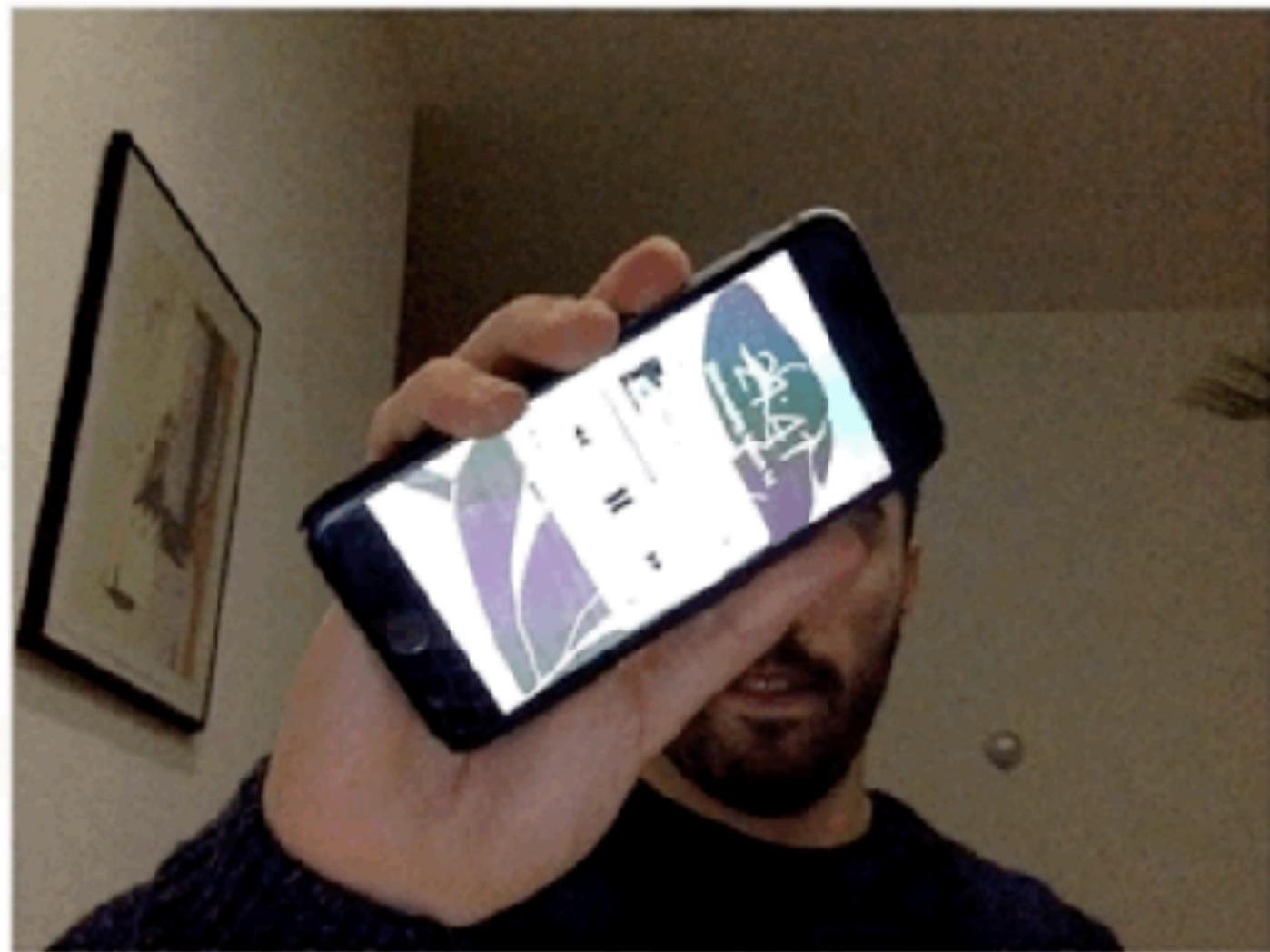


**LET'S MAKE SOMETHING!**



# imageClassifier('MobileNet')

ported by Cristobal Valenzuela



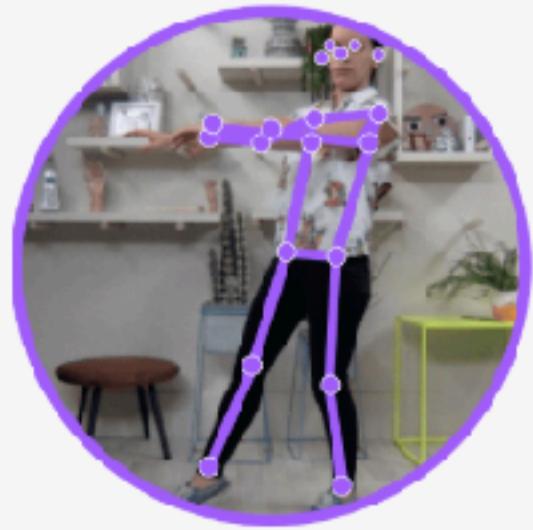
My guess is a iPod.

My confidence is 0.63.

```
const classifier = ml5.imageClassifier('MobileNet');

classifier.classify(video, gotResult);

function gotResult(error, result) {
  console.log(result);
}
```



# PoseNet

ported by Cristobal Valenzuela, Maya Man, Dan Oved.



```
const posenet = ml5.poseNet(video);

posenet.on('pose', function(results) {
  poses = results;
});

function draw() {
  if (poses.length > 0) {
    circle(poses[0].nose.x, poses[0].nose.y);
  }
}
```



# Style Transfer

ported by Yining Shi



```
const cubist = ml5.styleTransfer('models/cubist', modelReady);

function modelReady() {
  cubist.transfer(video, gotImage)
}

function gotImage(error, result) {
  image(result.image, 0, 0);
}
```