

# Introduction to Artificial Intelligence and Machine Learning

Danilo A. Sarti

[daniло.sarti@mu.ie](mailto:daniло.sarti@mu.ie)



<https://danilosarti.github.io>

# Hello, presentations and what we will do here!!

- ▶ Tell us who you are, what you are working on, and what you hope to get out of the week.
- ▶ What are Intelligence, Artificial Intelligence, and Machine Learning.
- ▶ Where are these things being used? Why?
- ▶ PLaying around with AI and ML.
- ▶ If you want to know what a brain is, you should build one!!
- ▶ The brain: learning how to learn, focus, and diffuse modes of the brain, neurons, and neuron networks.
- ▶ Beyond the games!!
- ▶ Step by Step example of application. How the banks make money and help people.
- ▶ Github: [https://github.com/danilosarti/summer\\_school\\_mu](https://github.com/danilosarti/summer_school_mu)

# What are Intelligence, Artificial Intelligence, and Machine Learning.

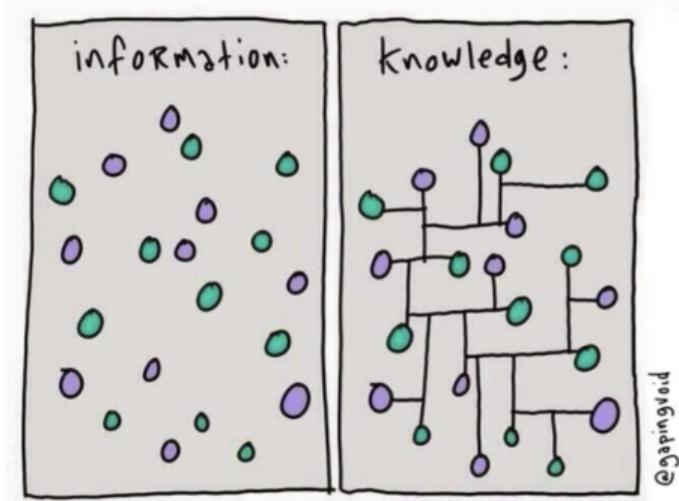


Figure 1:

Intelligence: convert information into knowledge. Source: <https://thoughtcatalog.com>



Figure 2:

Artificial Intelligence. Source: <https://www.teachingtimes.com>

## What are Intelligence, Artificial Intelligence, and Machine Learning.

NAME	GRADE	—	INTERVIEW	INTERVIEWER
1	9th		poorly	40
2	10th		well	44
3	9th		well	36
4	9th		poorly	34
5	9th		poorly	—
6	9th		—	—
7	9th		—	—
8	9th		—	—
9	9th		—	—
10	9th		—	—
11	9th		—	—
12	9th		—	—
—	—		—	—

STRP ID	SampleType	—	heightMean	yield Stems
1	TL	—	60	N
2	TL	—	80	S
3	TL	—	100	L
4	TL	—	80	E
5	TL	—	70	P
6	TL	—	60	—
7	TL	—	70	—
8	TL	—	—	—
9	TL	—	—	—
10	TL	—	—	—
11	TL	—	—	—
12	TL	—	—	—

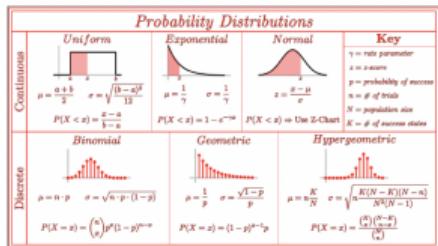


Figure 3:

Machine Learning. Source: google + author

# Where are these things being used? Why?



Figure 4:

Applications of ML: Social media and  
Streaming Source: <https://google.com>



Figure 5:  
Applications of ML: Self driven cars:  
<https://www.siliconrepublic.com>

# Where are these things being used? Why?

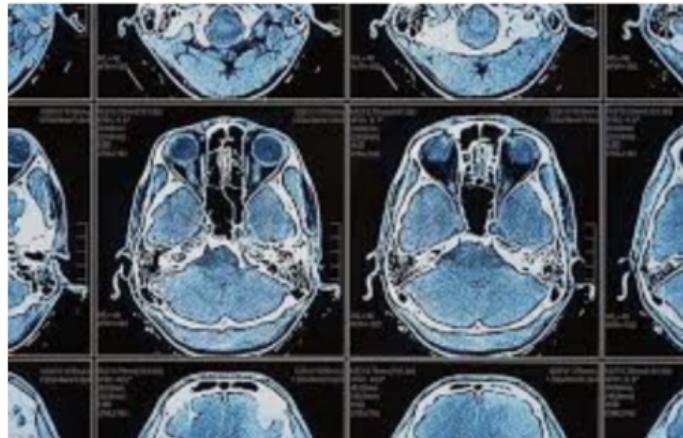


Figure 6:

Applications of ML: Precision Medicine  
Source: <https://google.com>



Figure 7:

Applications of ML: Precision Agriculture  
Source: <https://google.com>

# Using ML for solving a problem: Feeding people and animals.

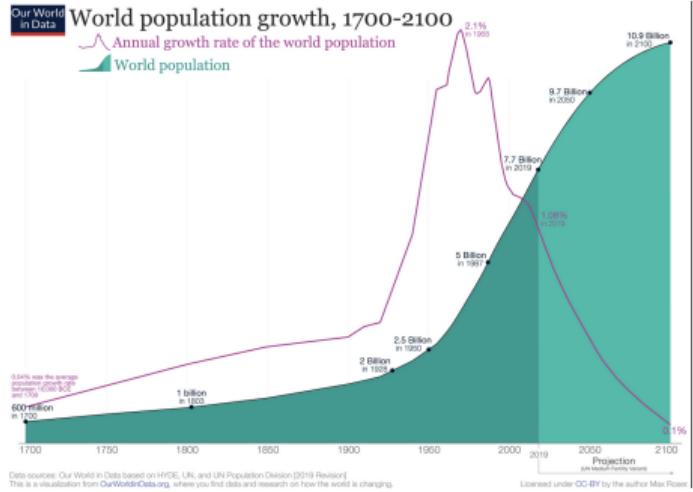


Figure 8:  
Human population. Source: Our world in data.

Figure 9:  
Food production. Source:  
<https://www.hi-in.com>

# ML and where does the food come from!

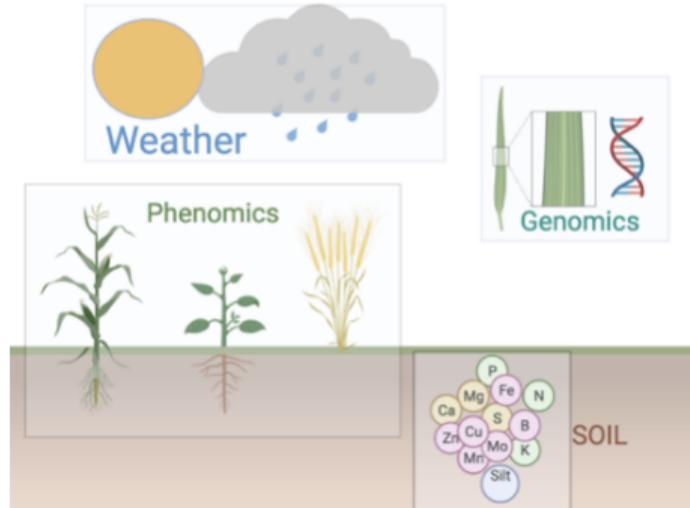


Figure 10:

Plant breeding and agriculture. Source:  
The author.



Figure 11:

ML for Agriculture. Source the author.

## Google experiments !!!

- ▶ <https://experiments.withgoogle.com/>
- ▶ Chopin explorer.
- ▶ Drawing with draw.
- ▶ Composing with song maker.
- ▶ Knowing boomy.
- ▶ Crazy videos with ML.

## Music: Composing with song maker!!!

<https://musiclab.chromeexperiments.com/Song-Maker/>

## Music: Composing with AI!!!

<https://boomy.com/>

## Challenge:

Compose your own piece of music!!

<https://musiclab.chromeexperiments.com/>

More serious stuff:

<https://experiments.withgoogle.com/assisted-melody>

Some crazy videos ML does for us:

[https://www.youtube.com/watch?v=l3C2V6y8AUk&ab\\_channel=DaniloSarti](https://www.youtube.com/watch?v=l3C2V6y8AUk&ab_channel=DaniloSarti)

[#](https://www.youtube.com/watch?v=qw_k5u_CEKY&ab_channel=DaniloSarti)

If you want to know what a brain is, you should build one!!



Figure 12:  
Neuroscience. Source:  
Google.



Figure 13:  
Brain. Source:  
Webcommons.



Figure 14:  
Zoombie. Source:  
Google.

# The brain: learning how to learn, focus, and diffuse modes of the brain, neurons, and neural networks.



Figure 15:

Alien Neuron. Source:  
Barbara Oakley LHL.

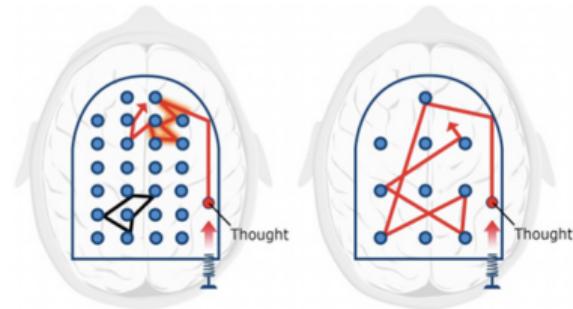


Figure 16:

Modes of the brain.  
Source: Barbara Oakley  
LHL.

- ▶ 30 Times More Powerful Than The Best Supercomputers

## Of pizzas and brain



- Focused work. - Break -  
<https://pomofocus.io/>

Figure 17:

Pomodoro. Source: Teamwork.com

# Machine Learn learnt from the brain

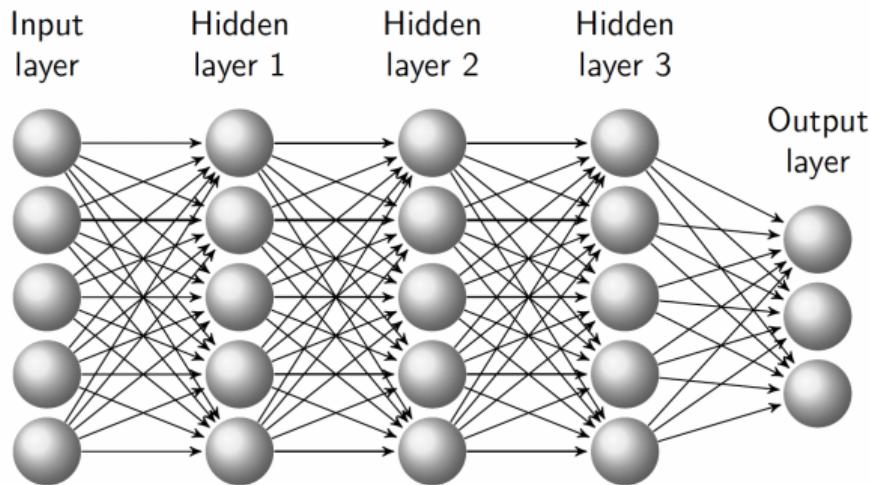


Figure 18:

Pomodoro. Source: Stone 2020

Beyond the games!! Game theory and Algorithmic trading.

Step by Step example of application.