Semillero de Investigación en Inteligencia Artificial

EAFIT’s AI Student Group

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We should try adding some photos next time...

About

We are a “student organization” that wants to gather together students interested in the growing field of AI.

Speakers

Raul Ramos Pollan - March 14, Thursday.

Myths and Truths about Artificial Intelligence

And probably others...

What are we going to learn?

An overview of classical machine learning techniques.

- Supervised and unsupervised learning.
- How to understand how effective is our ML model
- Some applications
- And maybe an introduction to Deep Learning? (At least CNNs)

What previous knowledge should I have?

- Programming experience!!!!
- Linear Algebra
- Calculus
- Probability

Don’t worry too much if you aren’t an expert in those topics. We’ll try to keep explanations as simple as possible.

We’ll share some additional resources to refresh this later.

How are we going to do it?

- Flipped classroom! (We are not lazy, I swear!)
- You watch the videos and we solve your questions!
  Also we'll try to give you some practical exercises. We won't promise anything though.
- We'll also go quickly over the topics at the beginning of each session in order to spark questions and start the discussion.

Resources

- https://www.coursera.org/learn/machine-learning
- https://www.cs.ubc.ca/~nando/340-2012/lectures.php
- http://www.cs.cmu.edu/~ninamf/courses/601sp15/lectures.shtml
- https://work.caltech.edu/telecourse.html
- The Elements of Statistical Learning
- An Introduction to Statistical Learning with Applications in R (It also has a free course from Stanford)
- Google, StackOverflow, data science blogs, other courses and books, etc...

For those that already know ML

- If there are enough people that already know ML, we encourage you to start making projects! We'll try to help you as far as we can.
- We'll try to give an introduction to Deep Learning next semester. Wish us luck.

Session 0: Introduction to AI

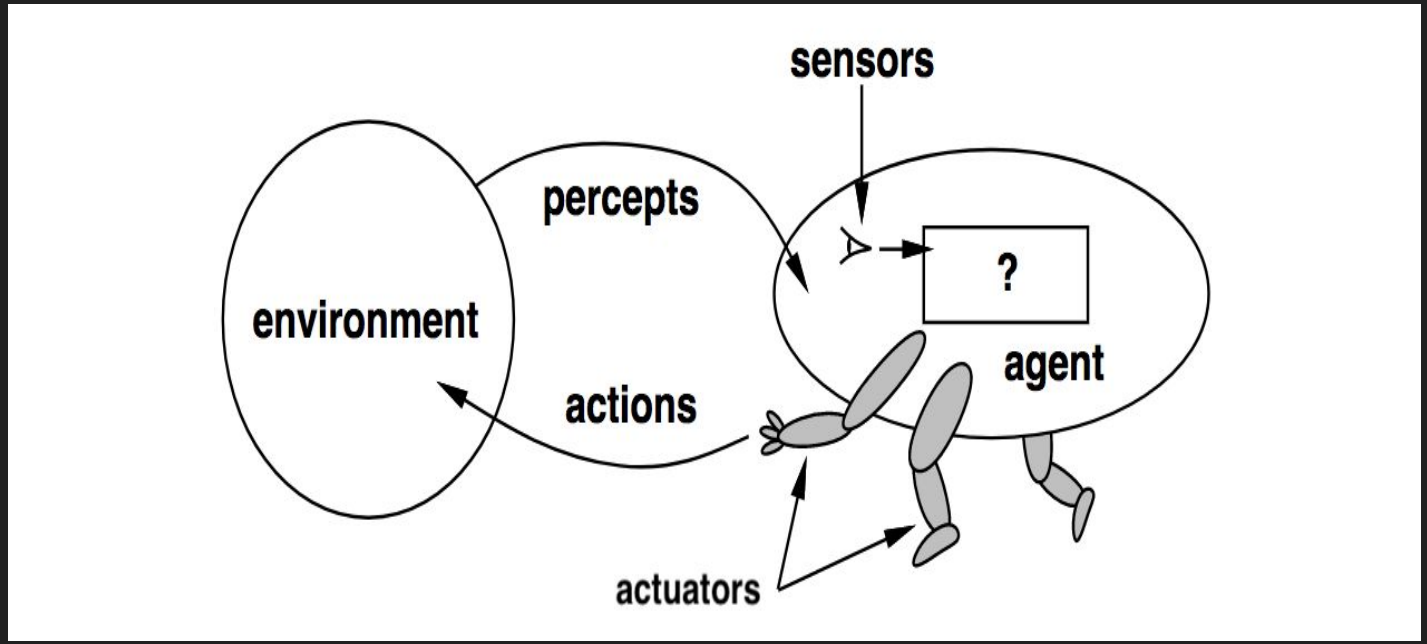
Mostly a very simplistic overview of the history of AI

What is AI? (some book examples)

- **According to Wikipedia:** AI is intelligence demonstrated by machines, in contrast to the natural intelligence displayed by humans and other animals.
- “[The automation of] activities that we associate with human thinking, activities such as decision-making, problem solving, learning . . .” **(Bellman, 1978)**
- “The study of mental faculties through the use of computational models.” **(Charniak and McDermott, 1985)**
- “The study of how to make computers do things at which, at the moment, people are better.” **(Rich and Knight, 1991)**
- “Computational Intelligence is the study of the design of intelligent agents.” **(Poole et al., 1998)**

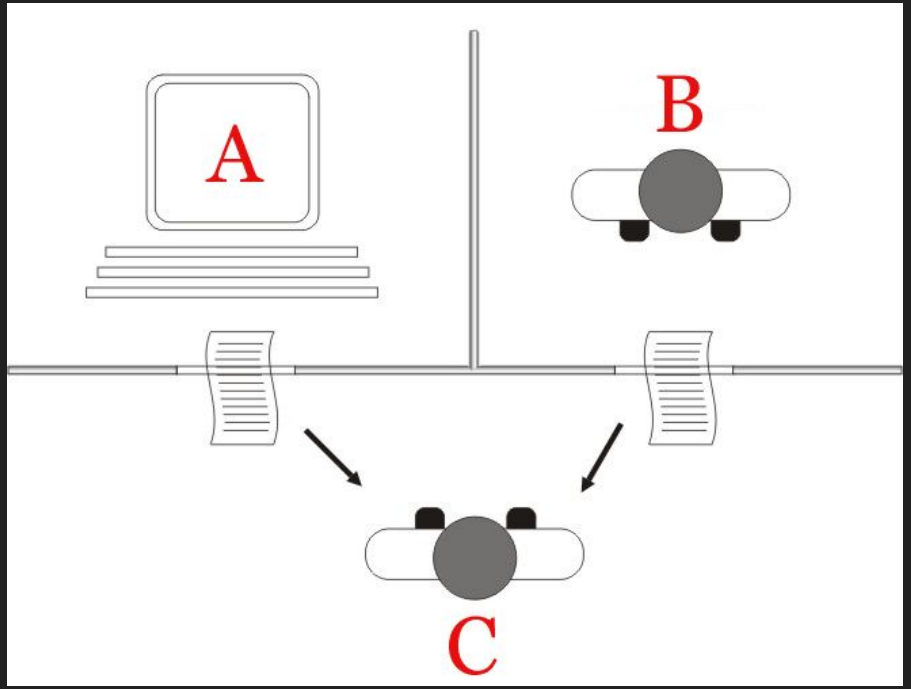
What is AI?

- The field that studies how to build **intelligent agents.**



How it began?

- The Turing test.



Knowledge-based systems

- AKA just a bunch of if-else statements. (Not totally right. It’s actually more like a brute-force approach to AI)

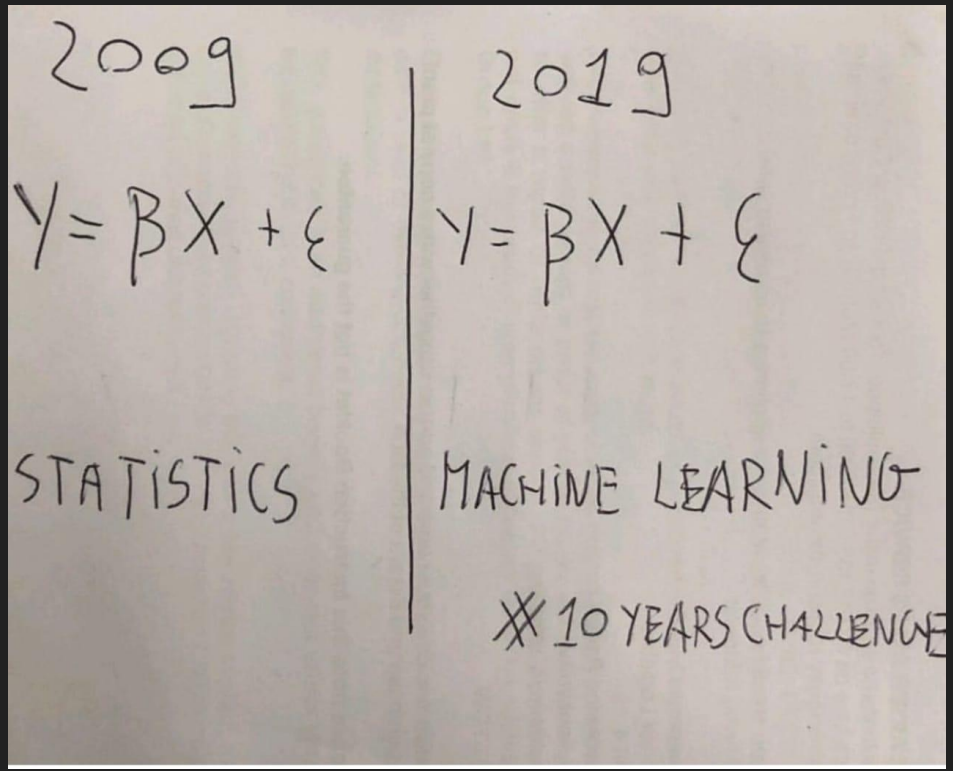
The dead of Knowledge-based systems

- They don’t really work that well.
- That’s it.

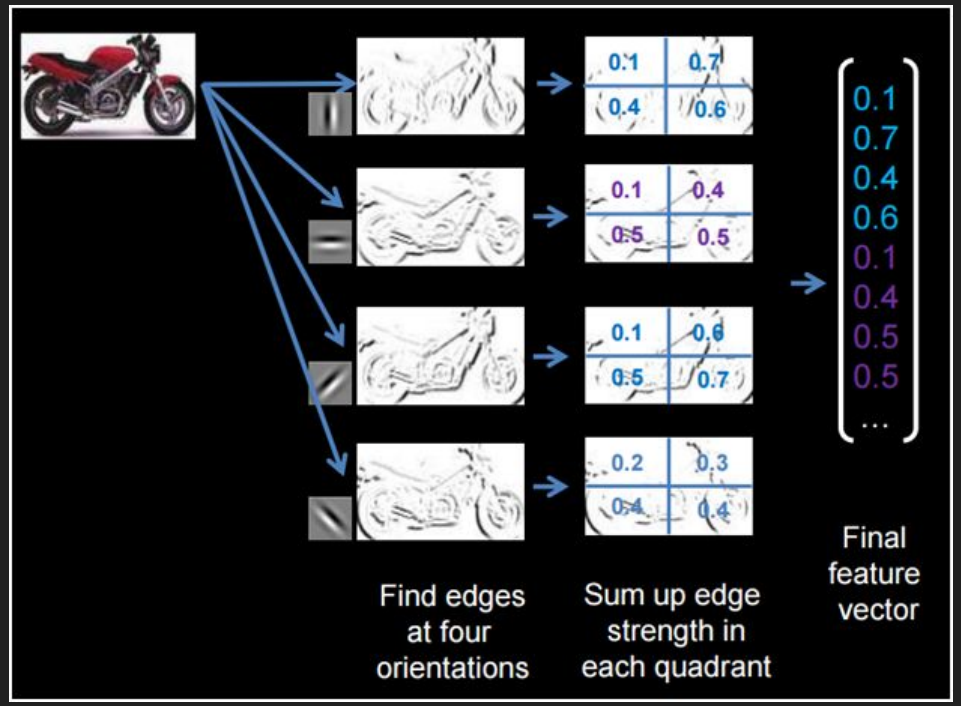
What if we use statistics?

- We want an algorithm that can learn from data on it’s own.
- The real world is not deterministic.
- Computers are starting to become amazingly fast.

Machine Learning is born!

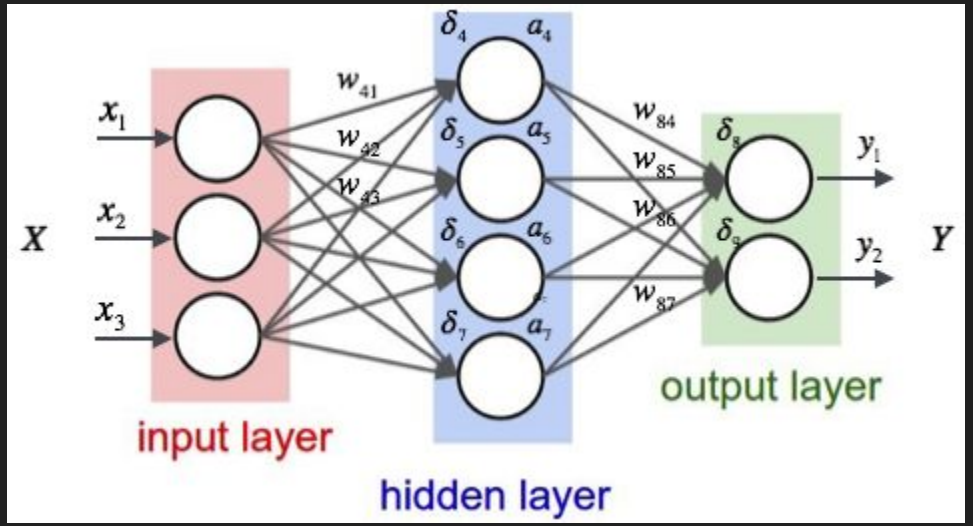


But we still need to manually craft the inputs



Maybe there is something else...

- Did anyone tried replicating the brain?



Yes!

Kinda…

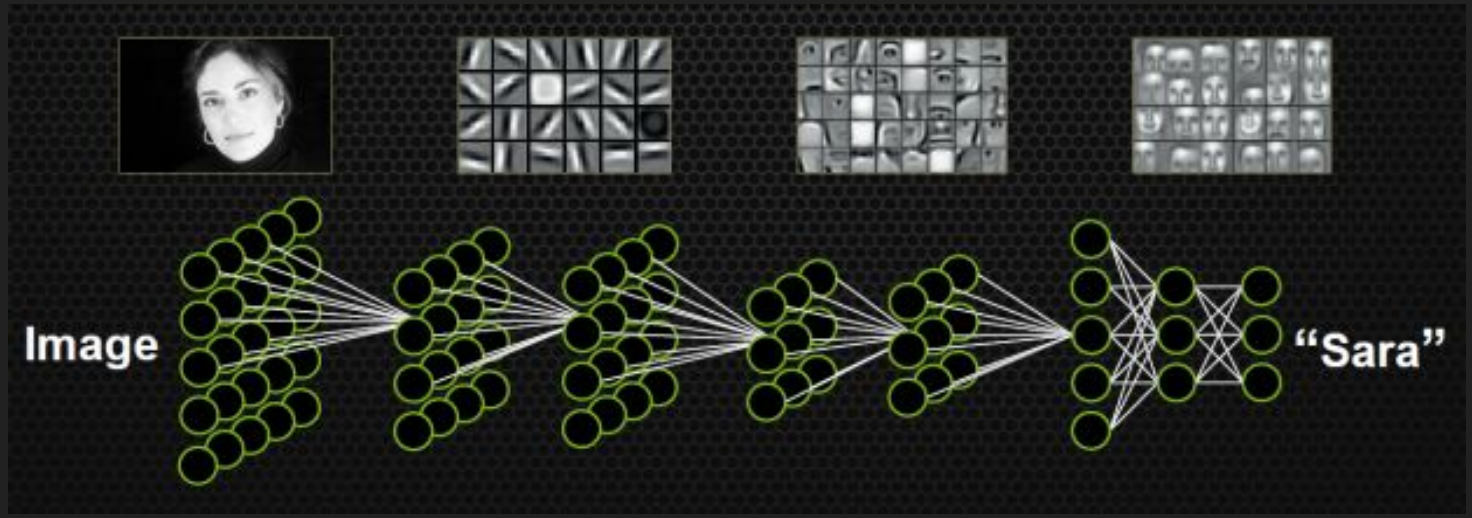
They made a mathematical model of a neuron.
They called it **the perceptron.**

But it was missing something...

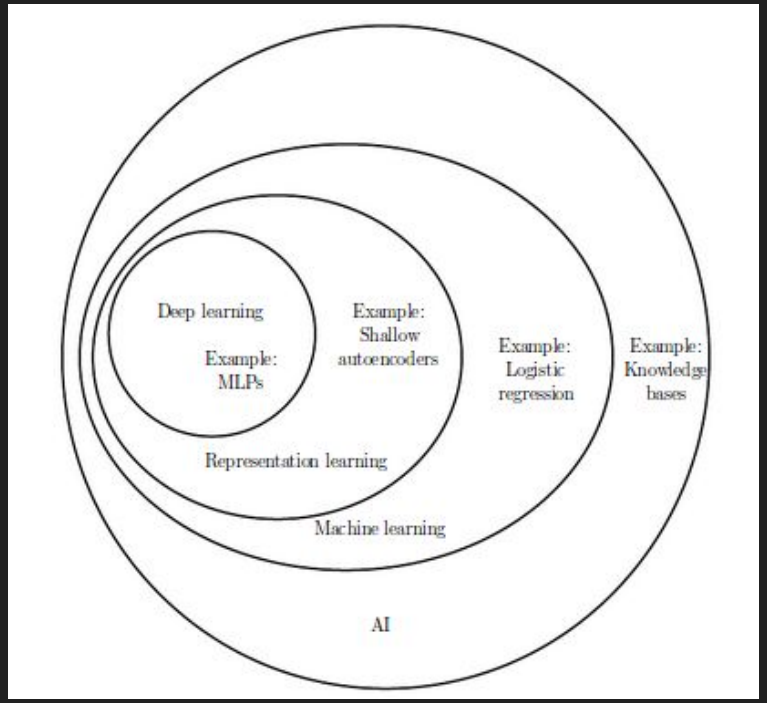
What if we use a bigger network?

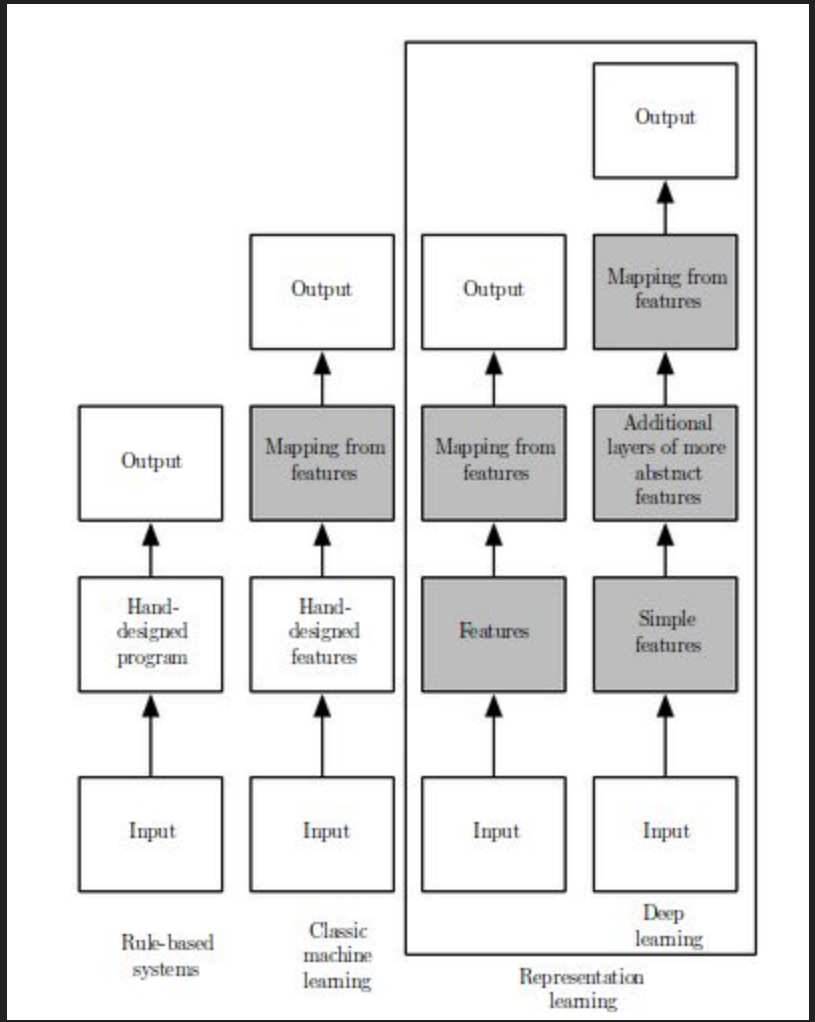
Like the brain!

Deep Learning is born!



This is where we are




Output
Output
Output
Mapping from features
Output
Mapping from features
Mapping from features
Additional layers of more abstract features
Hand-designed program
Hand-designed features
Features
Simple features
Input
Input
Input
Input
Rule-based systems
Classic machine learning
Deep learning
Representation learning

Some “solved” problems by AI

- Computer vision
- Speech recognition
- Language translation
- Playing games
- Robotics
- Some other less impressive examples that can still be considered AI.

Wait, why learn classic ML techniques?

- Even if it is presented like that, Deep Learning is not a silver bullet.
- Sometimes simple is better.
- Statistics still exists.
- Deep Learning still depends on a big dataset and a lot of computing resources.

A visual introduction to ML

- http://www.r2d3.us/visual-intro-to-machine-learning-part-1/

Any questions?

Before you leave

https://goo.gl/forms/HhQQ2bfDqua1NKUm1