ARTIFICIAL INTELLIGENCE HISTORY

HISTORY

- Gestation (1943-1955)
- Birth of AI (1956)
- Early enthusiasm (1952-1969)
- A dose of reality (1966-1973)
- Knowledge-based systems (1969-1979)
- AI Industry (1980-…)
- The return of neural networks (1986-…)
- Emergence of Intelligent Agents (1995-…)
- Robotics, Vision, Deep Learning (2006- …)

GESTATION (1943-1955)

- McCulloch and Pitts propose the first model of a neuron.
- Calculation of simple functions.
- Neural networks as learning
- Minsky and Edmonds: 1st network 1951 (SNARC, 40 neurons)
- 1950, Alan Turing: "Computing Machinery and Intelligence": Turing test

BIRTH OF AI (1956)

- John McCarthy organized the famous two-month Dartmouth Workshop.
- Newell y Simon propose "Logic Theorist" for automated reasoning (symbolic AI)
- New name of the field: "Artificial Intelligence" instead of "Computational Rationality".

EARLY ENTHUSIAM (1952-1969)

- Great expectations!
- Newell y Simon propose the "General Problem Solver" (GPS) for the imitation of human problem-solving prtocols.
- Gelertner: Geometry Theorem Prover
- Samuel: checkers learning program
- McCarthy: Lisp
- MIT: Micro-worlds (blocks world).
- Neural networks: adalines, perceptrones (rosenblatt).

A DOSE OF REALITY (1966-1973)

- Simon: within 10 years a computer would be chess champion (it came true within 40 years rather than 10!).
- GPS was a really difficult task!
- Combinatorial explision!
- Minsky and papert's book: Perceptrons!

KBS (1969-1979)

- GPS vs. KBS
- Expert systems:
- DENDRAL (for infering molecular structure from mass spectometer information).
- MYCIN (for diagnosing blood infections with about 450 rules).
- Separation of the Knowlede Base and the Inference Engine.

AI INDUSTRY (1980-…)

- Expert systems companies!
- R1: at the Digital Equipment Corporation for configuring orders for new computer systems (savings $40 million a year).
- Du Pont: 600 expert systems (savings of $10 millions a year)
- Many conferences on Expert Systems
- AI industry: Billions of dollars in 1988!

THE RETURN OF NEURAL NETWOKS(1986-…)

- Reinvention of the Back-Propagation learning algorithm by Rumelhart and Hinton (firt Bryson in 1969).
- Connectionist AI vs. Symbolic AI

INTELLIGENT AGENTS (1995-…)

- Agents an multiagent systems in Internet
- Softbots
- Besides, the first edition of the AIMA textbook was in 1995 which adopted de agent perspective.

DEEP LEARNING (2006- …)

- The Vanishing Gradient problem.
- 2006: Publications by Geoffrey Hinton, Yann LeCun, Yoshua Bengio et al.
- 2009: NIPS Workshop on Deep Learning for Speech Recognition.
- 2012: Deep Learning revolution.
- Application on unstructured data: pictures, audios, videos, etc.

DEFINITIONS

Behavior / Reference	Thinking	Doing
Human	Thinking Humanly	Acting Humanly
Rational	Thinking Rationally	Acting Rationally

THINKING HUMANLY

"The automation of activities that we associate with human thinking, activities such as decision-making, problem-solving, learning, etc."

Bellman (1978)

"The exciting new effort to make computers think … machines with minds, in the full and literal sense"

Haugeland (1985)

ACTING HUMANLY

"The art of creating machines that perform functions that require intelligence when performed by people"

Kurzweil (1990)

"The study of how to make computers do things at which, at the moment, people are better"

Rich & Knight (1991)

THINKING RATIONALLY

"The study of mental faculties through the use of computational models"

Charniak & McDermott (1985)

"The study of the computations that make it possible to perceive, reason and act"

Winston (1992)

ACTING RATIONALLY

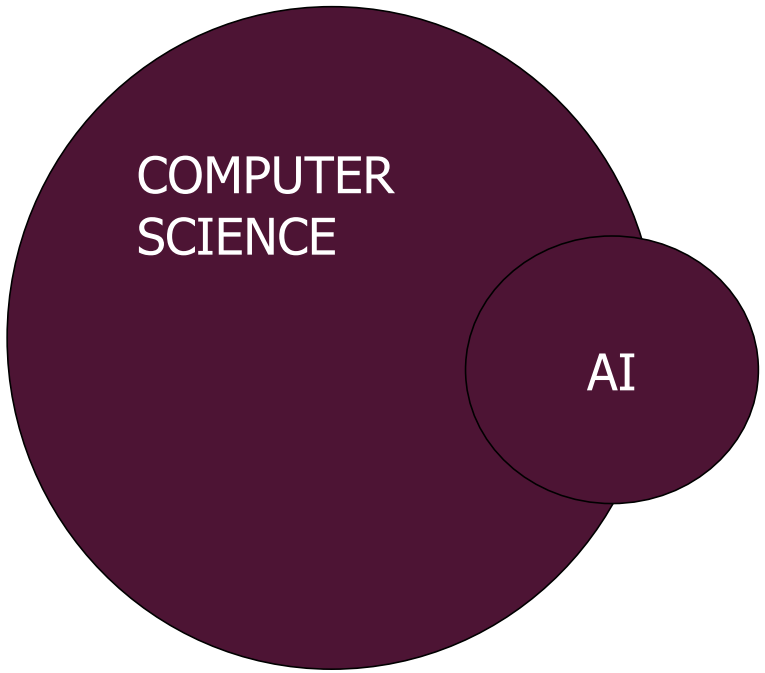
"Computational Intelligence is the study of the design of intelligent agents."

Poole et al. (1998)

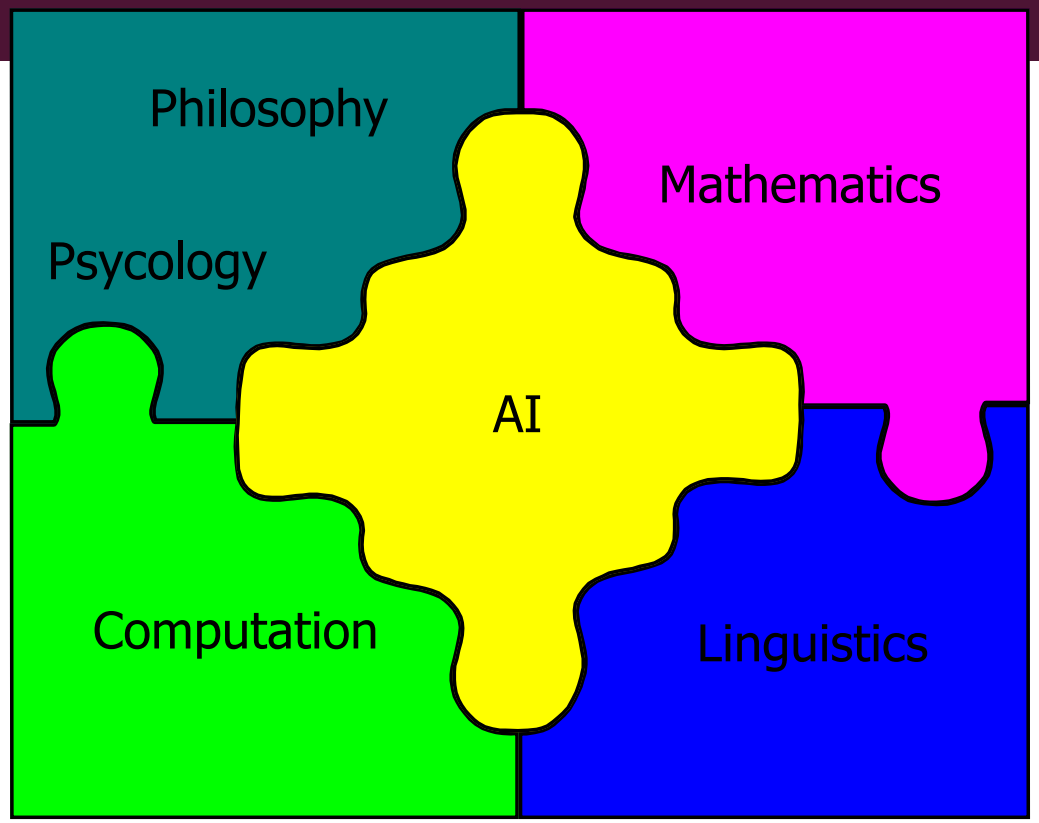
"AI... Is concerned with intelligent behavior in artifacts"

Nilsson. (1998)

WHERE IS AI?



MANY RELATED FIELDS



RELATIONSHIPS

- Philosophy
- Mathematics
- Economics
- Neoroscience
- Psychology
- Computation
- Control theory
- Linguistics