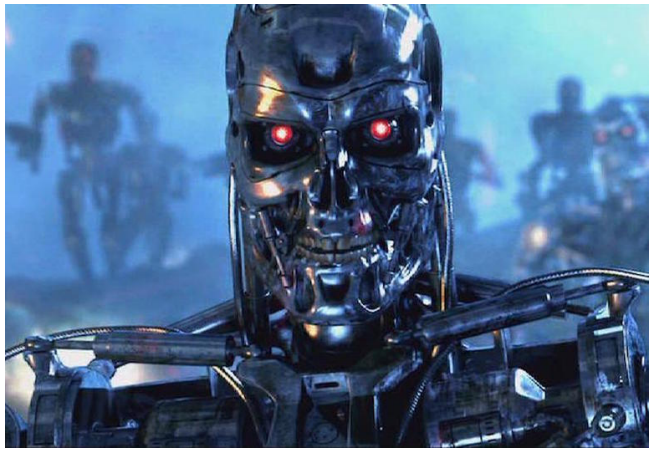
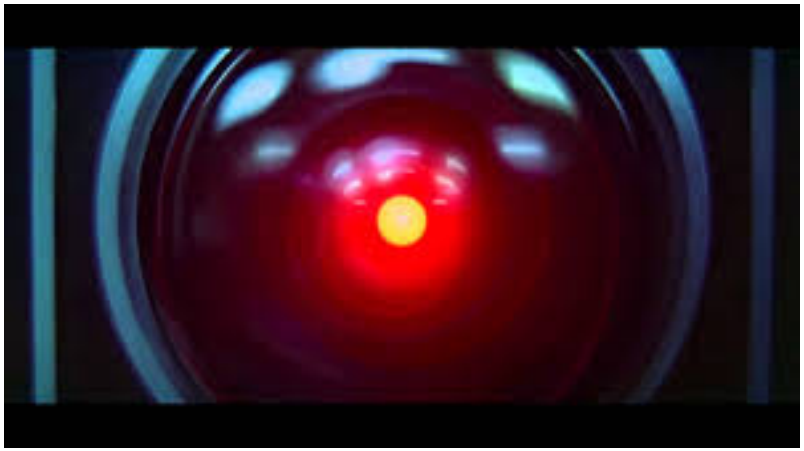


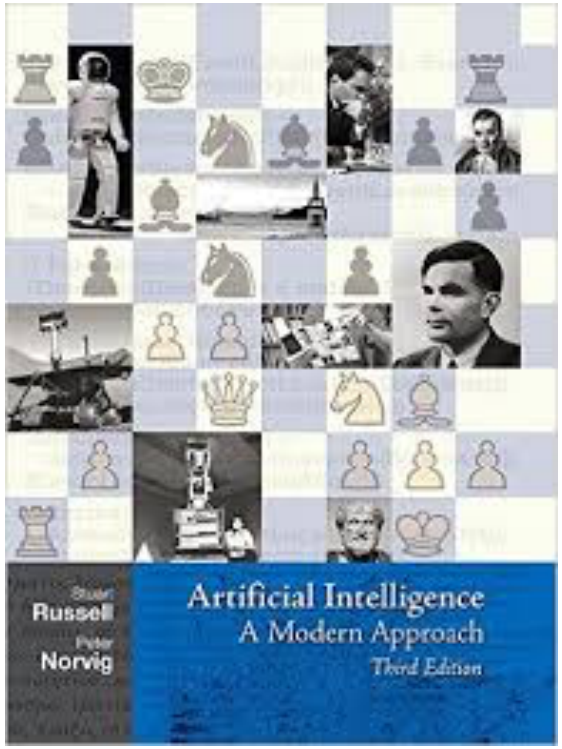


Artificial Intelligence

Class website

`cs.rhodes.edu/ai`

- *Artificial Intelligence, A Modern Approach* (3rd ed.)
- 2nd edition is acceptable, though 3rd is more up-to-date.
- Get it; standard textbook in the field.
- Additional readings supplied by me.



Grading

- Written homework (about 3-4) – 20%
- Programming projects (about 4-5) – 30%
- Midterm (Thursday, March 16, in class) – 25%
- Final exam (Monday, May 1) – 25%

Respect

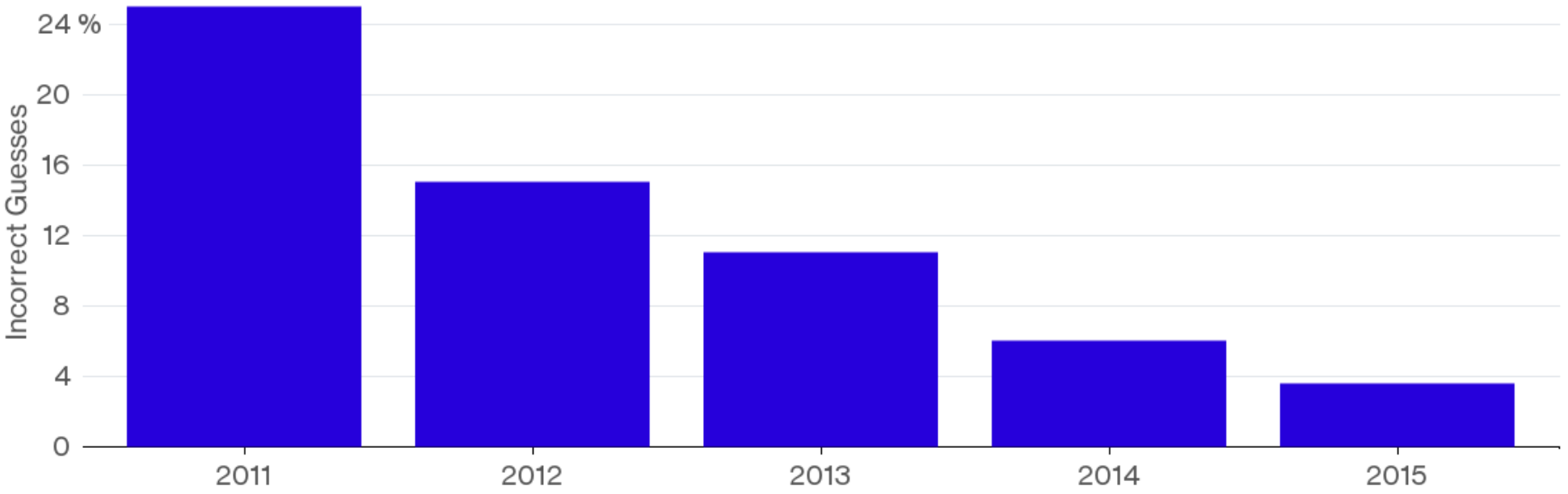
- Respect your classmates and me during class times.
  - Pay attention in class, no phones, turn off your screen when asked to do so.
  - Please don't be late.
  - Please raise your hand; don’t call things out unless I ask you to.
  - If you need to leave class in the middle, please raise

Course outline

- Last taught in Fall 2014; things have changed!

Computers Stop Squinting and Open Their Eyes

Error rates on a popular image recognition challenge have fallen dramatically since the advent of deep learning systems in the 2012 competition.

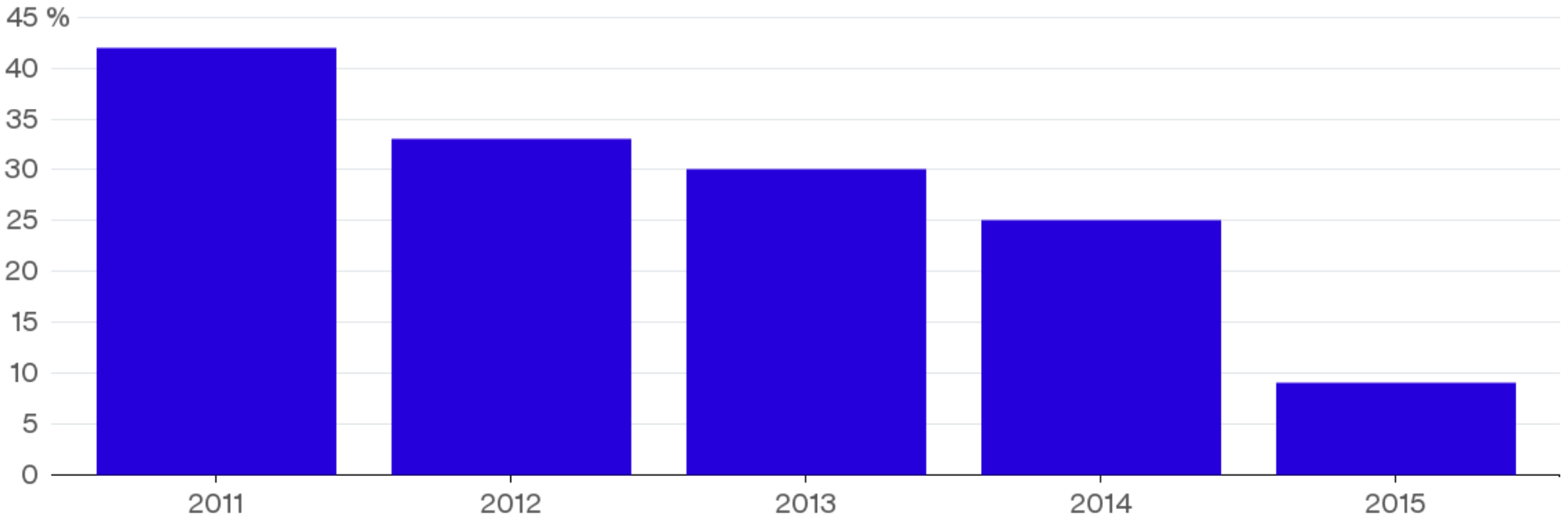


Sources: ImageNet, Stanford Vision Lab

Bloomberg

AI Learns to Pin the Tail on the Donkey

Computers are getting better at figuring out where in a picture a specific object is, with error rates dropping in recent years.

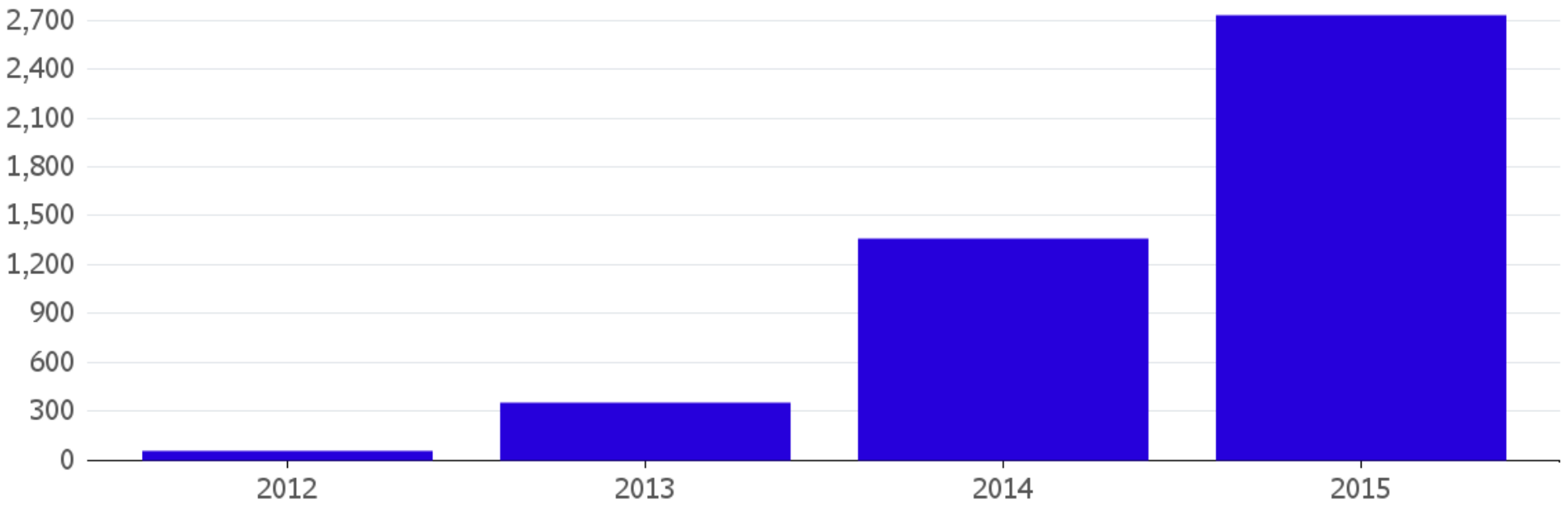


Sources: ImageNet, Stanford Vision Lab

Bloomberg

Artificial Intelligence Takes Off at Google

Number of software projects within Google that uses a key AI technology, called Deep Learning.



Source: Google

Note: 2015 data does not incorporate data from Q4

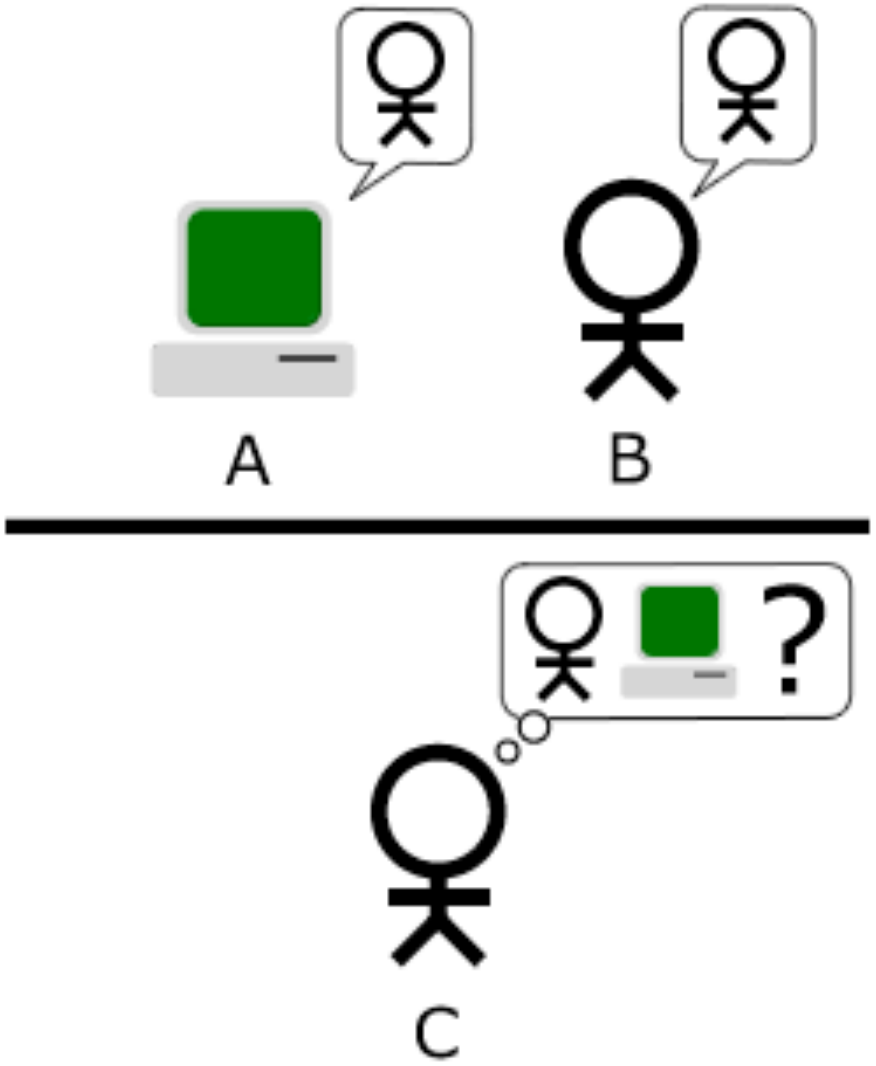
Bloomberg

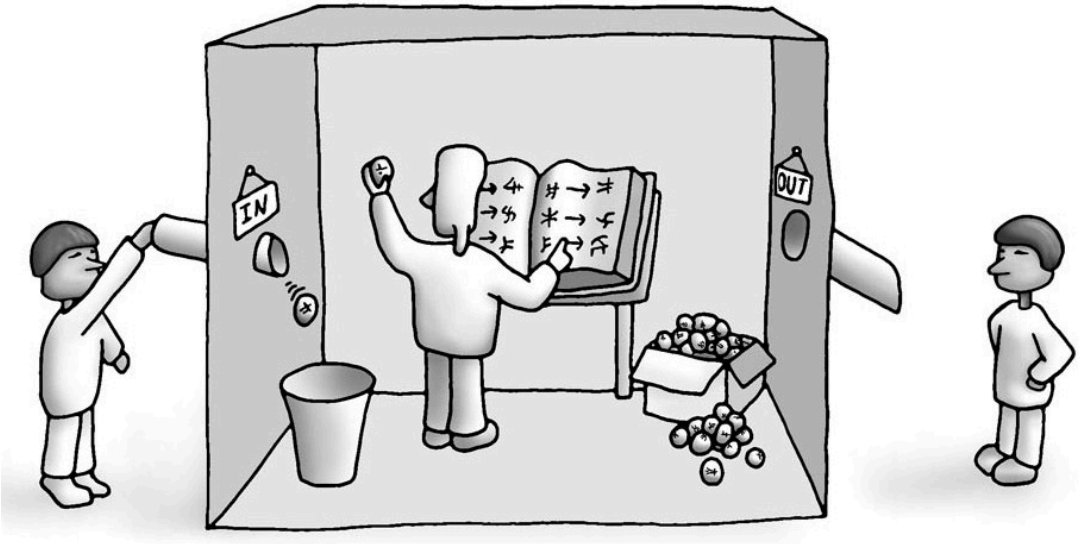
Course outline

- Last taught in Fall 2014; things have changed!
- March 2016: Google's DeepMind AlphaGo program defeats Lee Sedol, 4-1.
- September 2016: Google claims to use deep learning to produce natural language translations that are "nearly indistinguishable from human translation."
- Removing some topics from 2014 version, adding ***neural networks***.

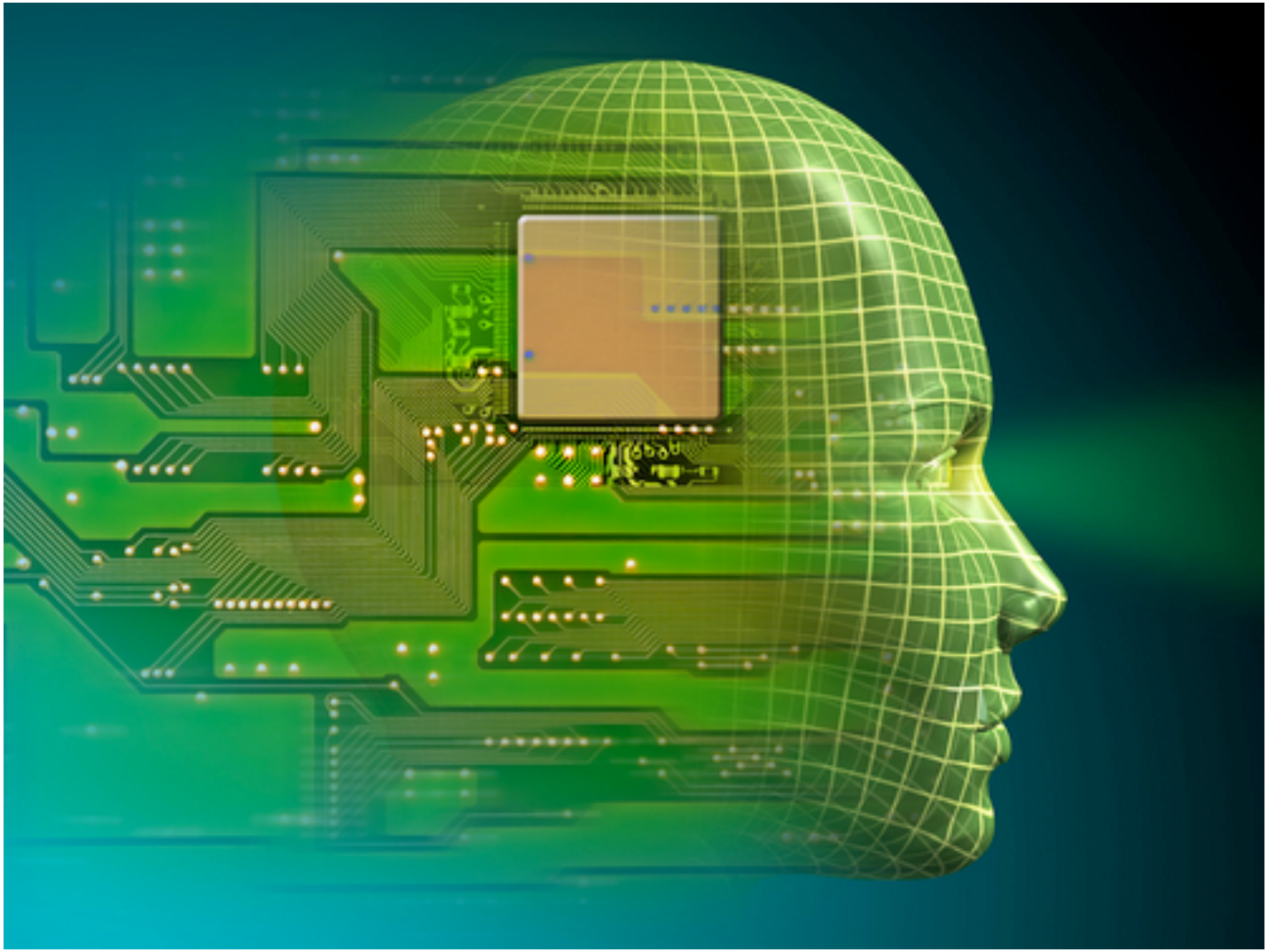
What is artificial intelligence?

Answer #1: Acting like a human




IN
OUT

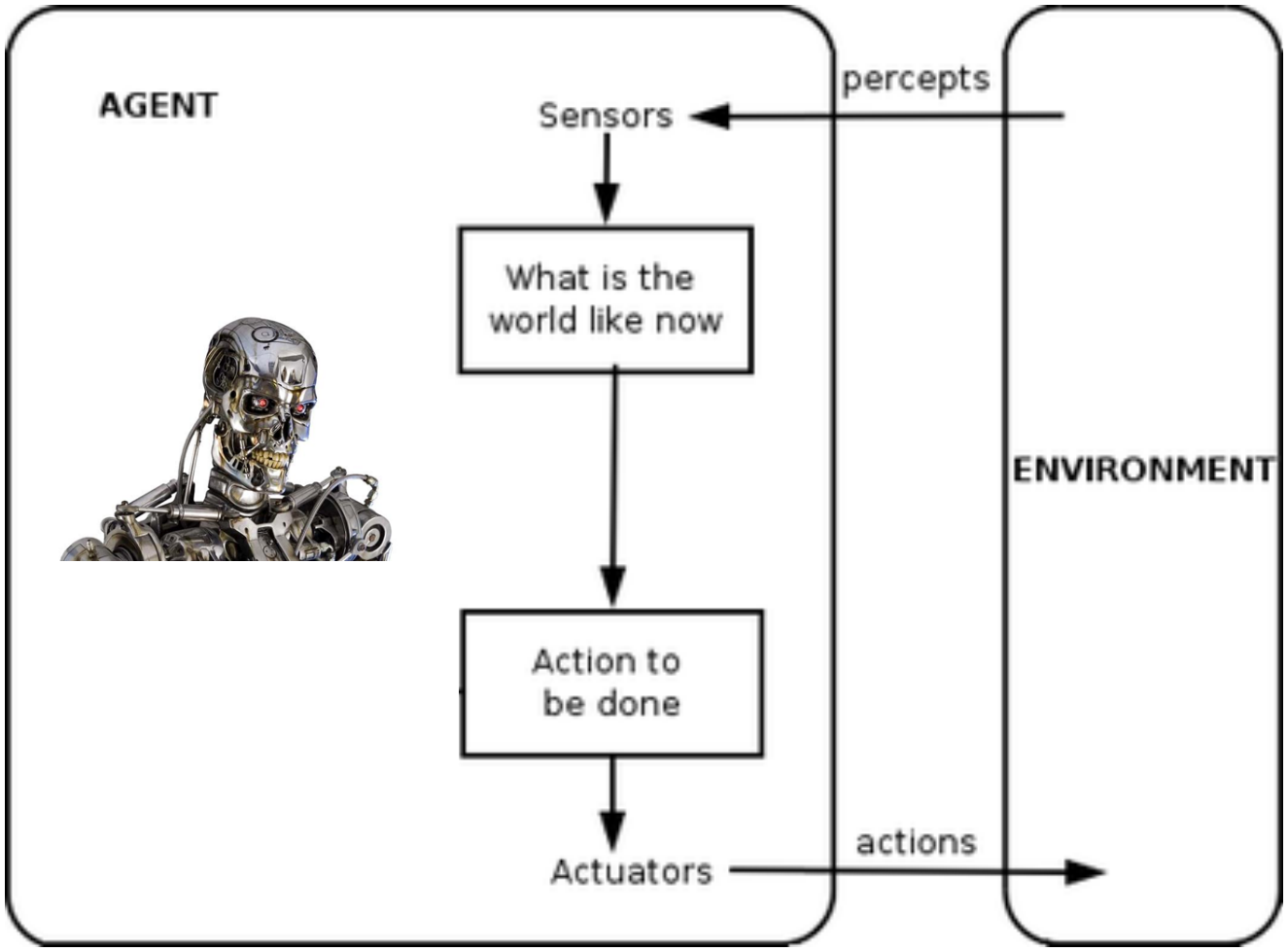
Answer #2: Thinking like a human



Answer #3: Thinking rationally

Answer #4: Acting rationally

Agents



Agents interact with their environment through sensors and actuators.

Rational Agents

- Rational agent:
  - For every possible percept sequence, a rational agent should
  - select an action that is expected to maximize its performance measure,
  - given evidence provided by the percept sequence and whatever built-in knowledge the agent has.

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Environments

- Fully-observable vs partially-observable
- Single agent vs multiple agents
- Deterministic vs stochastic
- Episodic vs sequential
- Static or dynamic
- Discrete or continuous