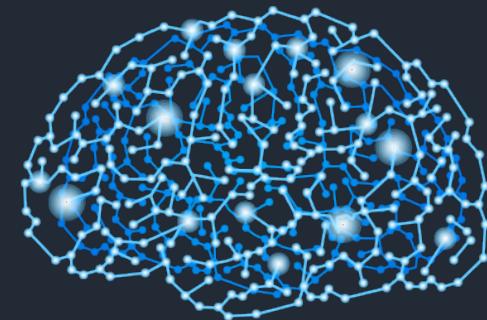


THE AI REVOLUTION

The far future coming soon

Paweł Żmiejko



Who I am?



NOXAI
start-up



What is intelligence?



What is AI?

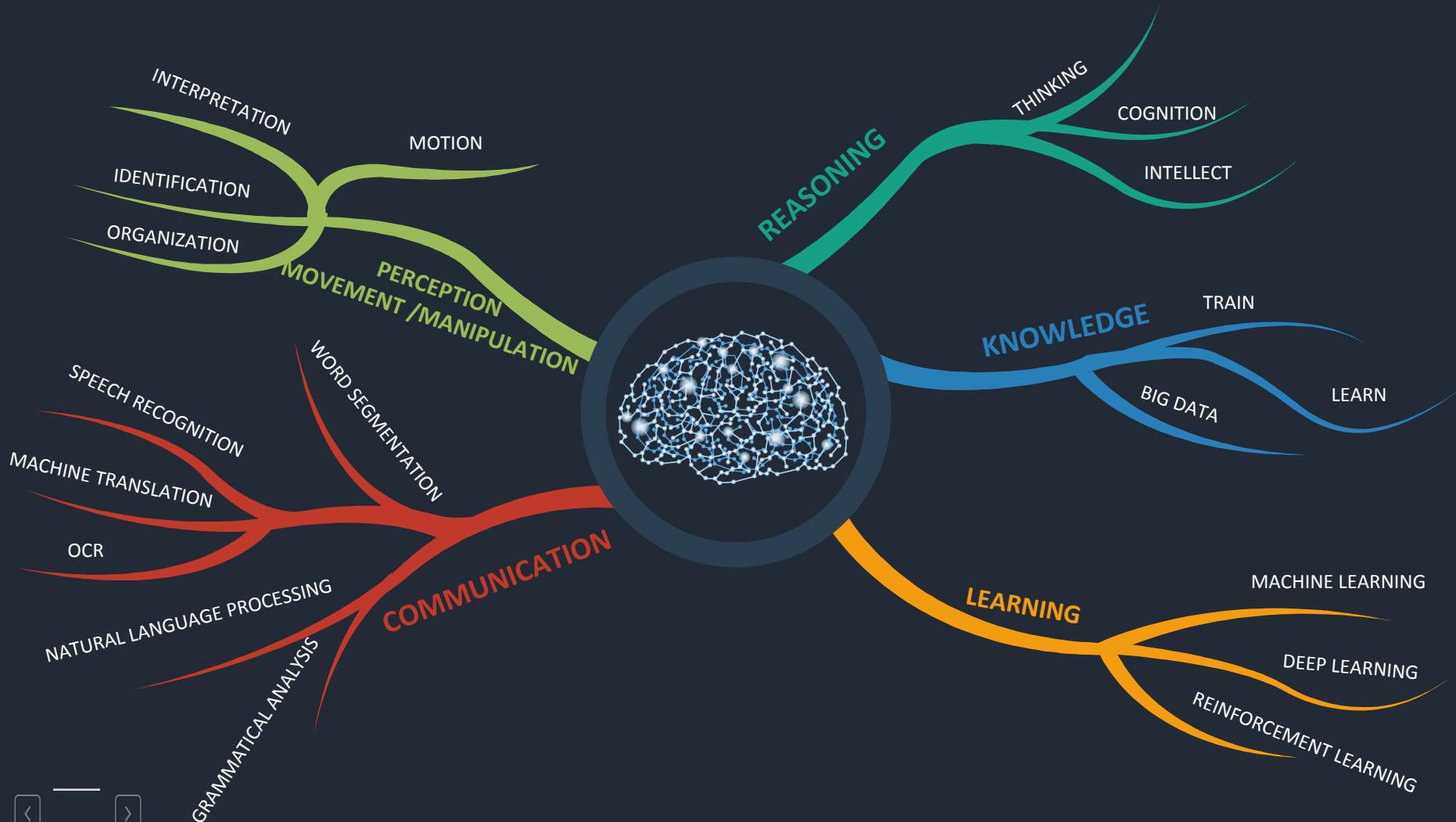
The science and engineering of making intelligent machines, especially intelligent computer programs.



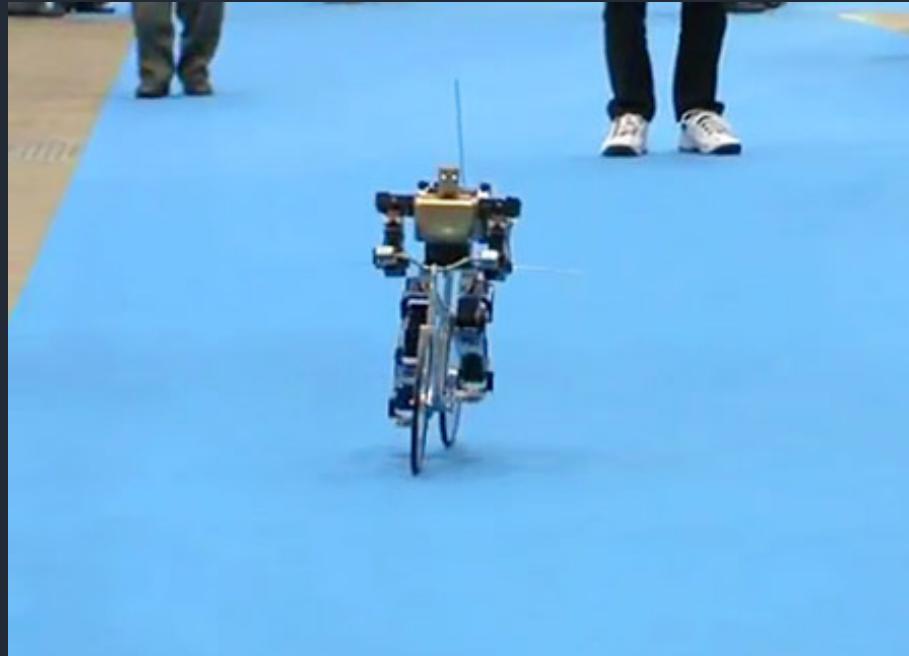
Related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable.

AI goals

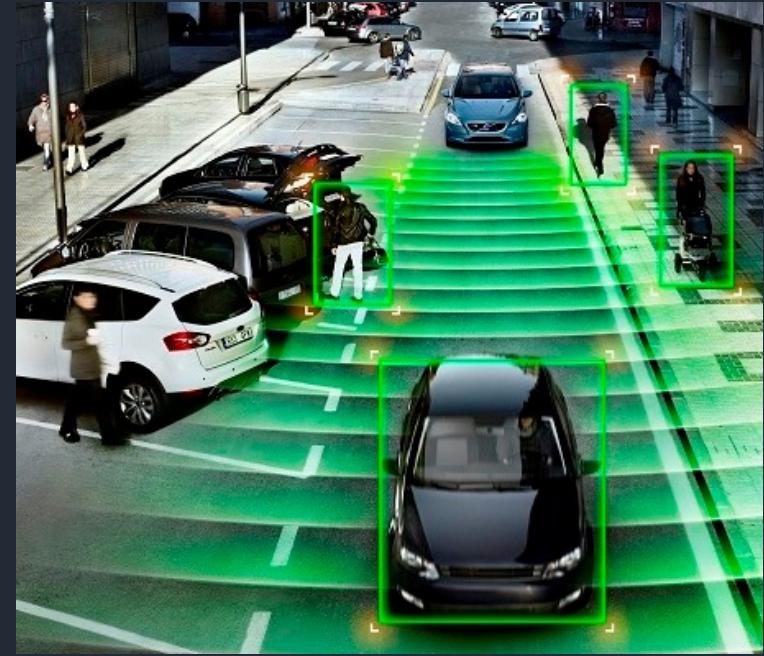
to act like a **human**



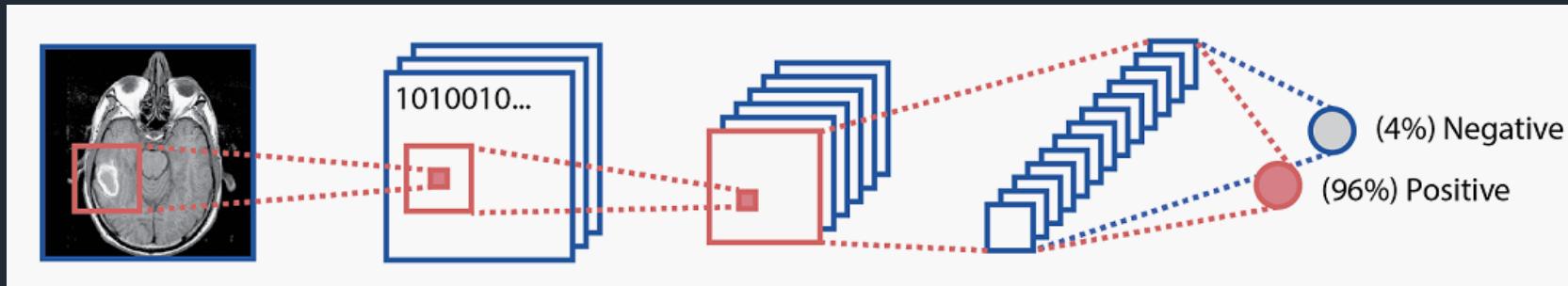
AI examples of use



Robot rides a bike



Self driving cars



Cancer diagnosis



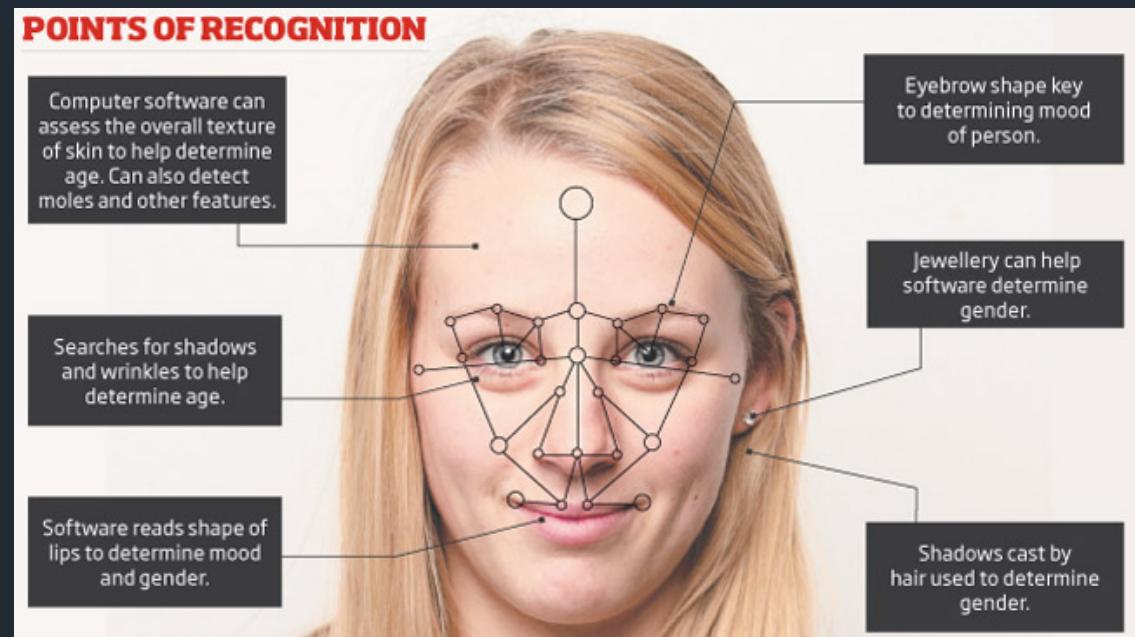
Success stories

- Deep Blue defeated the reigning world chess champion Garry Kasparov in 1997. Deep Blue's computer was 10 million times faster than the Ferranti Mark 1 from 1950s.
- During the 1991 Gulf War, US forces deployed an AI logistics planning and scheduling program that involved up to 50,000 vehicles, cargo, and people
- NASA's on-board autonomous planning program controlled the scheduling of operations for a spacecraft



Success stories

- Robot driving: DARPA grand challenge 2003-2007
- 2006: face recognition software available in consumer cameras
- IBM Watson defeats the two greatest Jeopardy! champions by a significant margin.



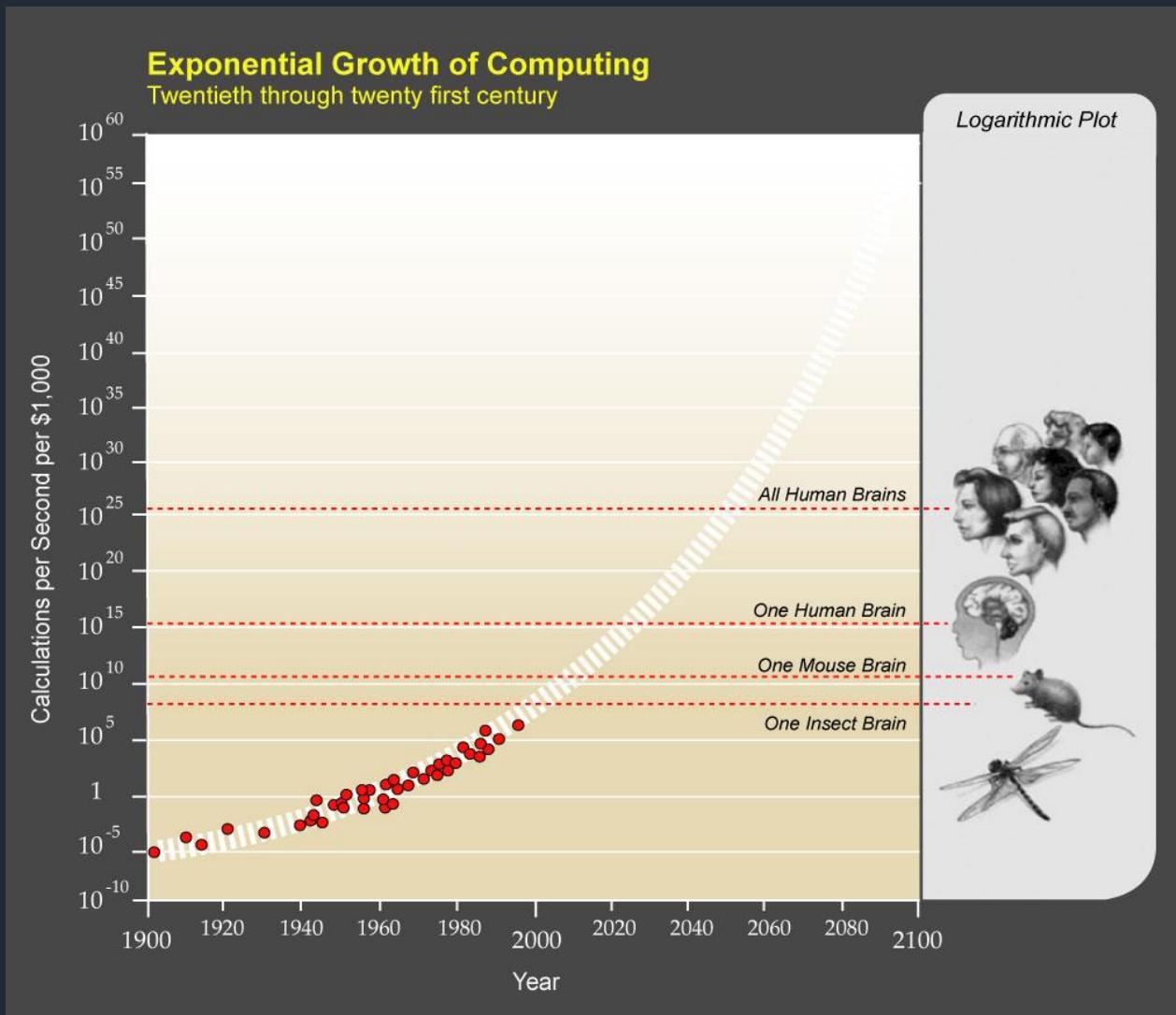
Turing Test



PASSED BY
COMPUTER
IN 2014

a test of a machine's ability to exhibit intelligent behavior equivalent to, or
indistinguishable from, that of a human

Computing power



Why now?



flood of available data
(especially with the advent of
the internet)



increasing computational
power

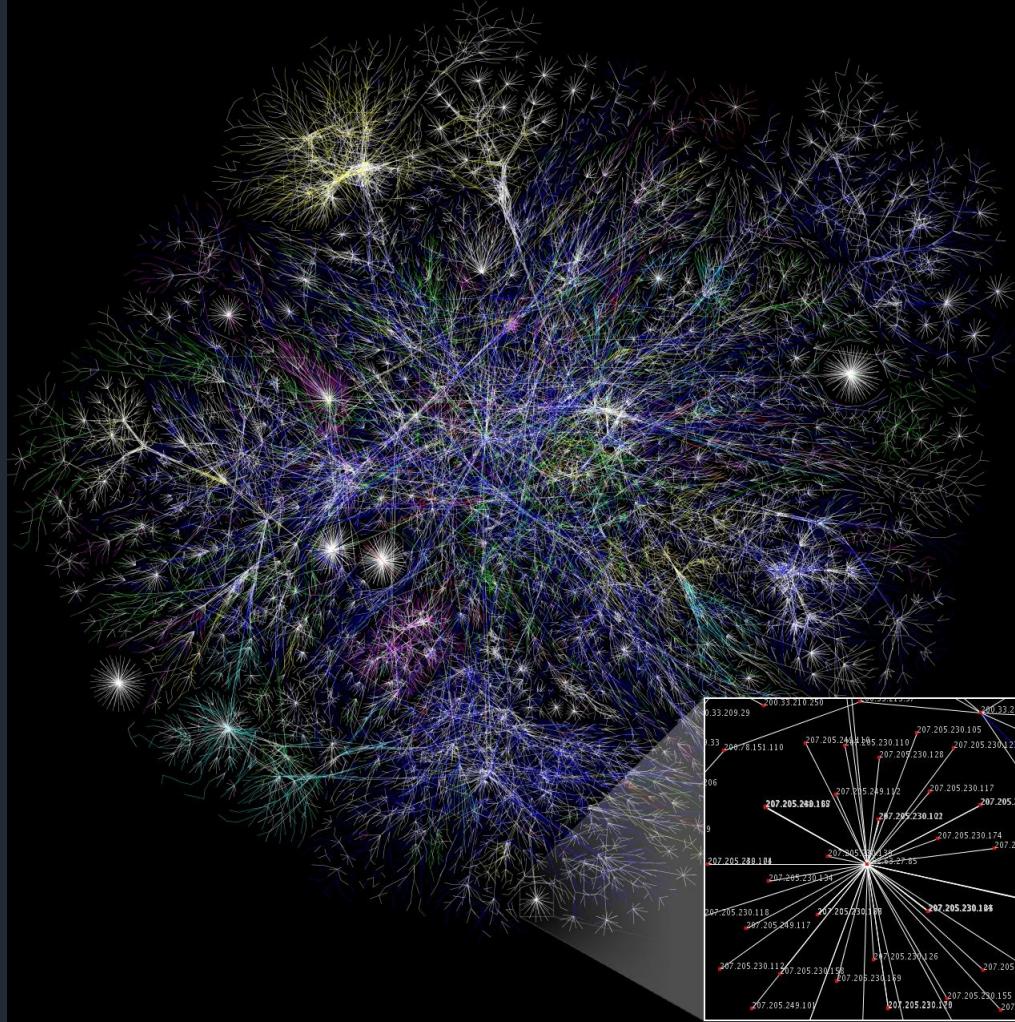


growing progress in available
algorithms and theory developed
by researchers



increasing support
from industries

Some routes in the Internet



What is Machine and Deep Learning?

Machine Learning is the field of study that gives computers the ability to learn without being explicitly programmed.

- Arthur Lee Samuel, 1959

Deep Learning is a new area of Machine Learning research, which has been introduced with the objective of moving Machine Learning closer to one of its original goals: Artificial Intelligence.

- Internet

Machine Learning basics

Machine Learning

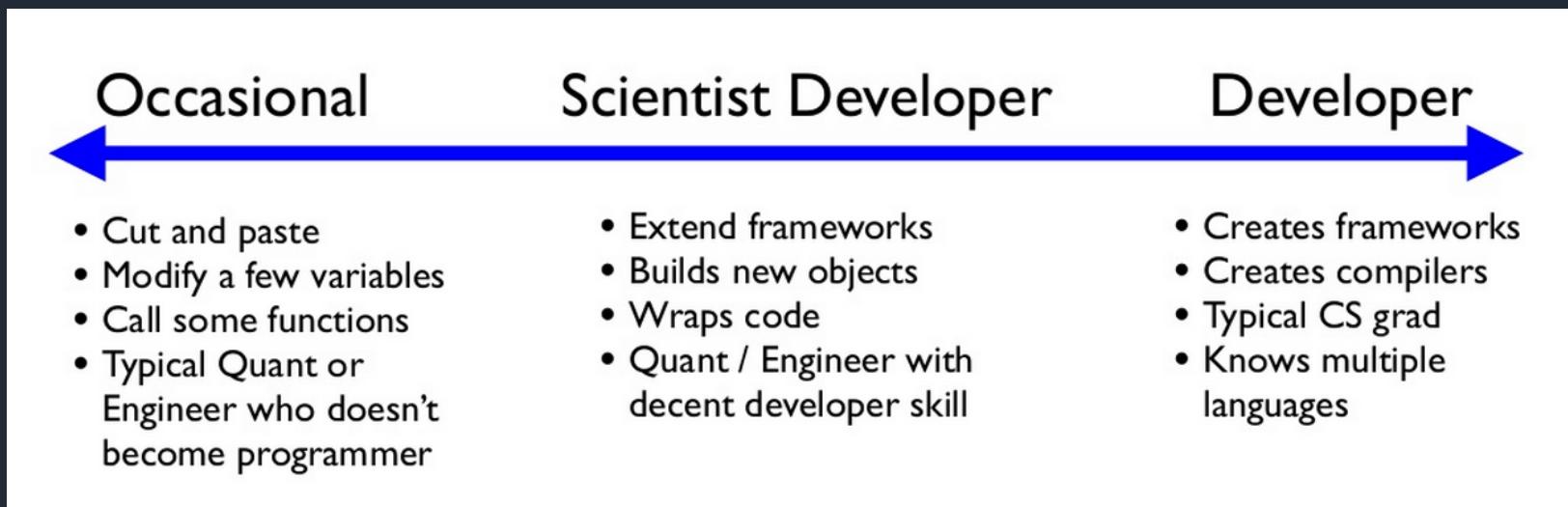
ML is the semi-automated extraction of knowledge from data

- Knowledge from data: Starts with a question that might be answerable using data
- Automated extraction: A computer provides the insight
- Semi-automated: Requires many smart decisions made by a human

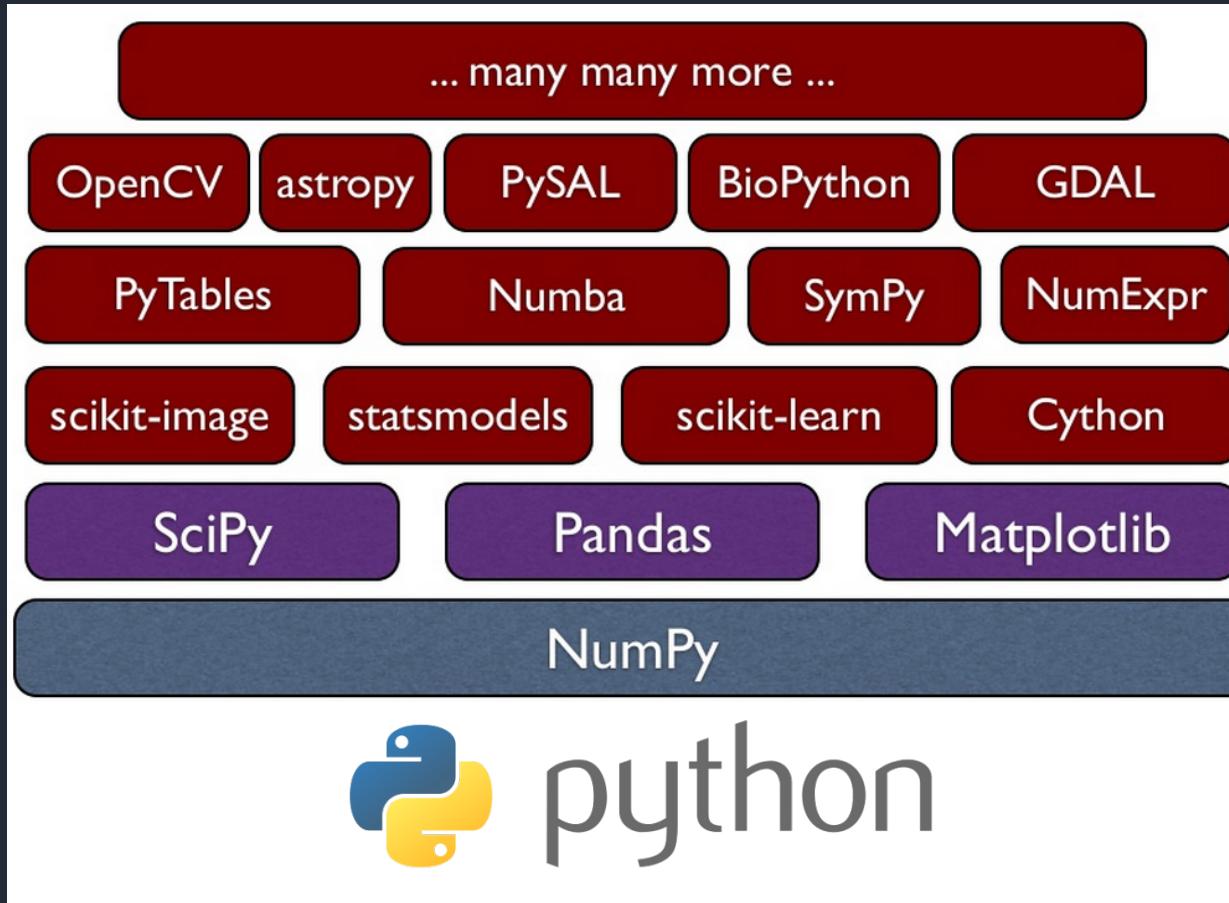
Types of Machine Learning

- Supervised learning
- Unsupervised learning
- Reinforcement learning

Python developer spectrum



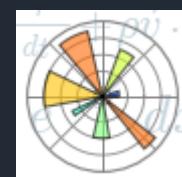
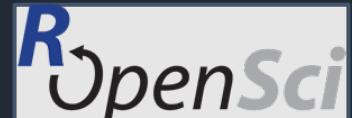
Python scientific stack





- supports and promotes world-class, innovative, open source scientific software
- provides a critical service as an umbrella organization which removes the burden from the projects themselves to raise money

PROJECTS



Let's write some ML code in Python ...

IP[y]: IPython
Interactive Computing

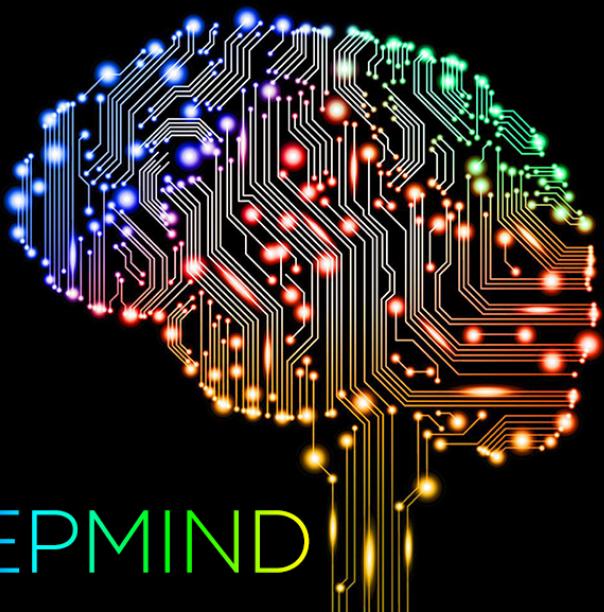


MACHINE LEARNING WITH SCIKIT-LEARN

How do
computers
learn from
data?

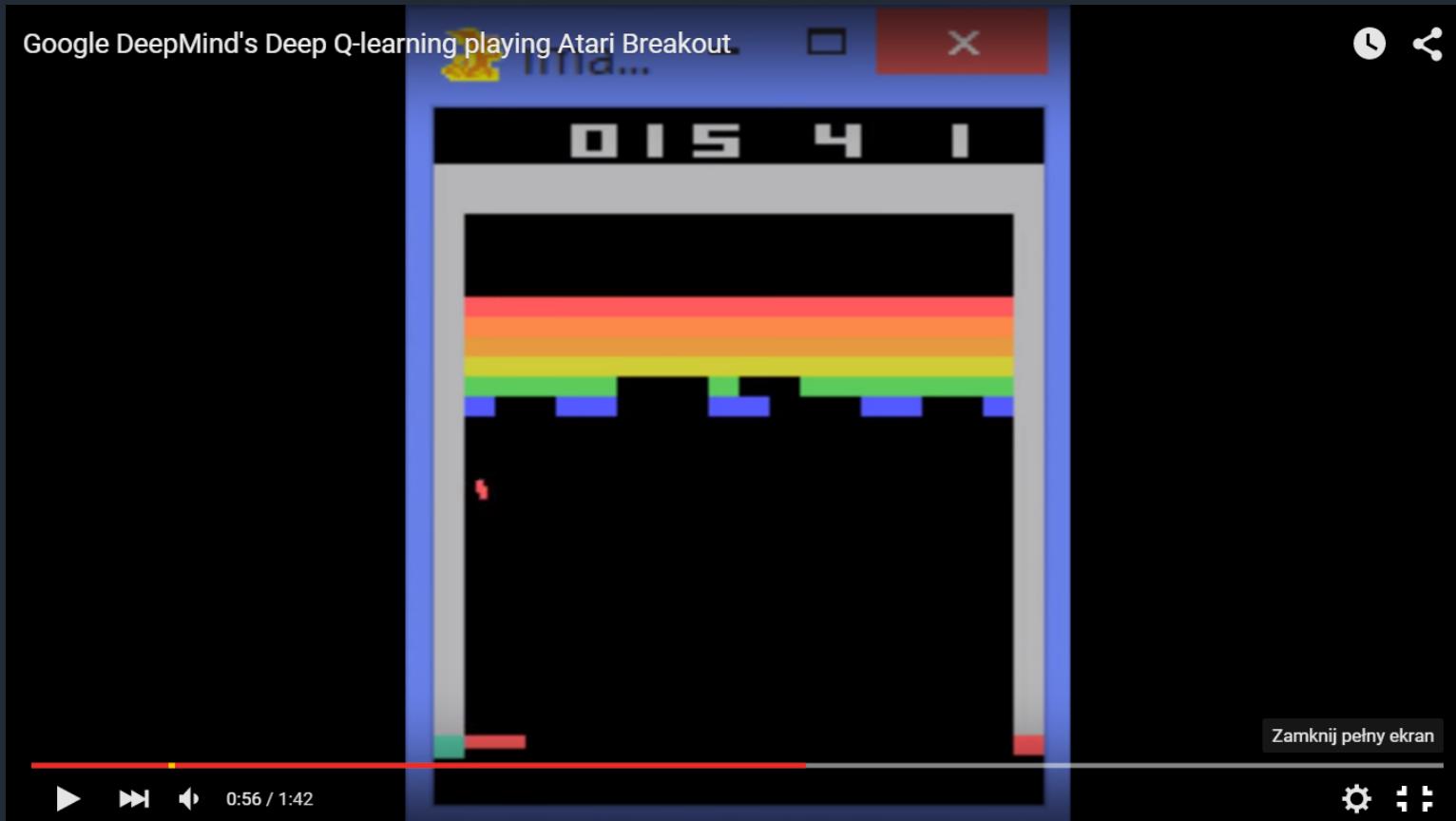


DeepMind - ML/DL and games



- “solving intelligence” and building neural networks to solve everything else
- achieved by combining *“the best techniques from machine learning and systems neuroscience to build powerful general-purpose learning algorithms”*
- not pre-programmed

Atari breakout



[Google DeepMind's Deep Q-learning playing Atari Breakout](#)

*[...] Attempting to distil intelligence into
an algorithmic construct may prove to
be the best path to understanding some
of the enduring mysteries of our minds.*

—Demis Hassabis (CEO Deepmind), Nature, 23

February 2012



Python - how to start?

MACHINE LEARNING WITH SCIKIT-LEARN

How do computers learn from data?



The background of the slide features a repeating pattern of binary code (0s and 1s) in a light gray color.

[Introduction to machine learning with scikit-learn](#)



PyData is coming to Warsaw!

**September 24, 2015
18:00**

**Adgar Ochota Conference Centre,
Al. Jerozolimskie 181 B, Warsaw**



PyData Warsaw



@pydatawarsaw



PyData Warsaw

Join over 280 Machine Learning
enthusiasts in our social media!

Local companies and projects that use AI



SO1

Questions?



Get in touch



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@pawelzmiejko



pzmiejko