

Class 17: Deep Thought

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outline

1. the hugeness of AI
2. the strangeness of AI
3. the opportunity of AI
4. starting in AI
5. perspectives

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logistics

Assignment solutions, grades posted this week

Final: June 8, 12:15-3:15, Cubberley Auditorium

Final will be open note, closed laptop

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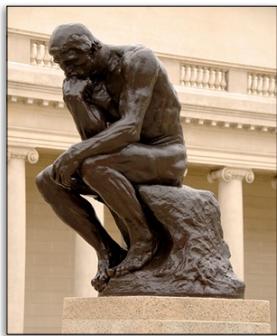
surface impressions are misleading



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human intelligence



logical-mathematical
spatial
linguistic
bodily-kinesthetic
musical
interpersonal
intrapersonal
naturalistic
existential

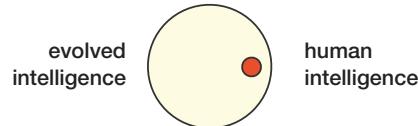
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a great space of possibility

human intelligence

a great space of possibility



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a great space of possibility

all intelligence

evolved
intelligence

human
intelligence

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how wide the range?



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the theological parallel

is the AI good?

is the AI all-powerful?

does the AI really love us?

is the AI incomprehensible?

can you manipulate the AI?

is AI fundamentally uncontrollable?

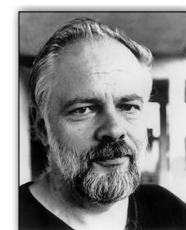
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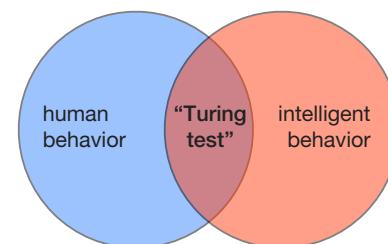
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changing perspectives



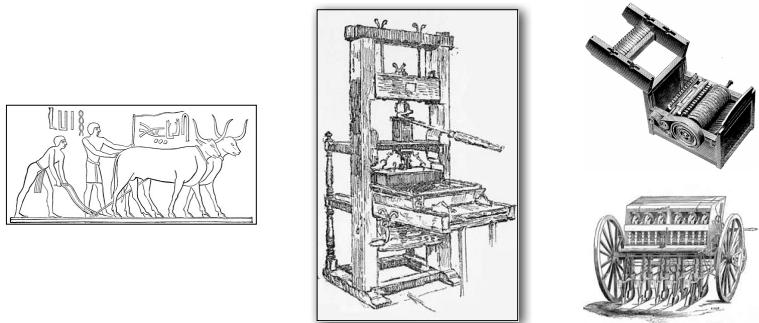
"Empathy test"



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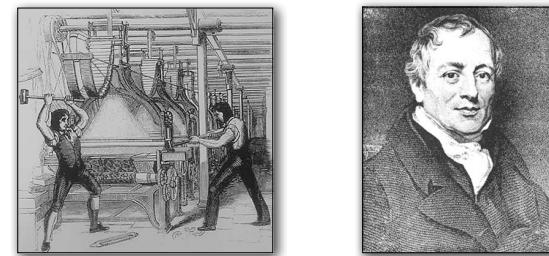
a history of displacement



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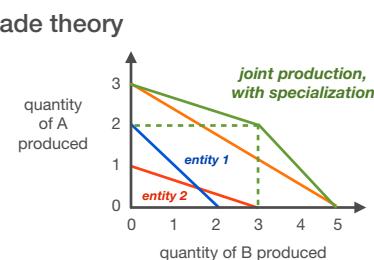
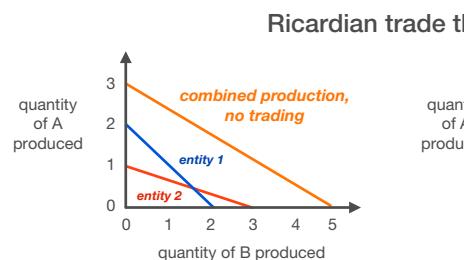
an uncertain impact



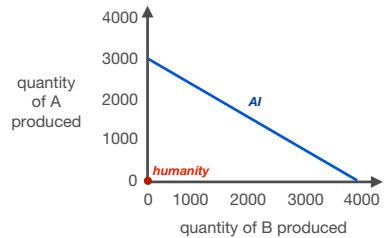
Luddites

David Ricardo

theory of comparative advantage



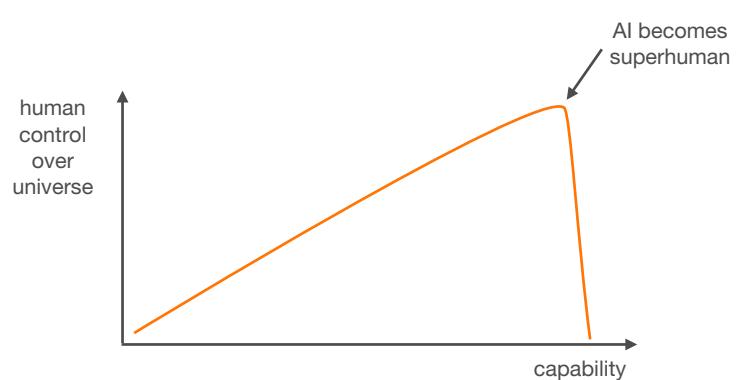
What happens when AI eclipses us?



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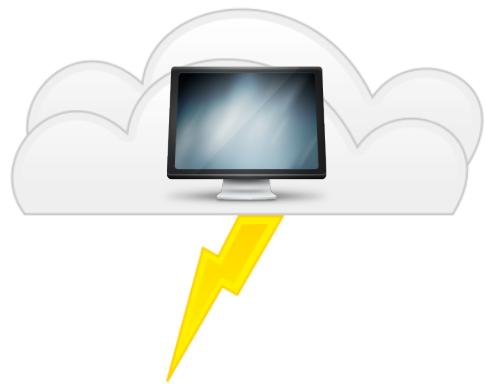
an unpredictable future



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does luck reappear?



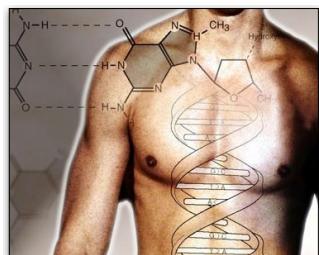
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comparing two opportunities



biotechnology

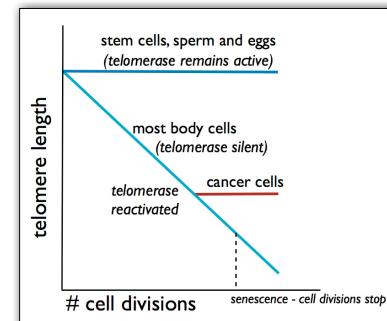


artificial intelligence

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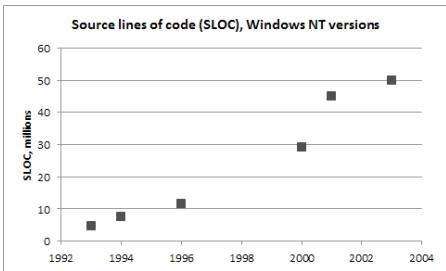
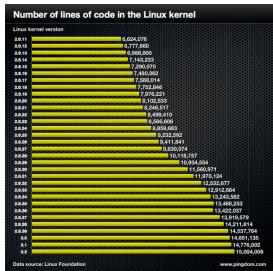
invisible barriers to biotech?



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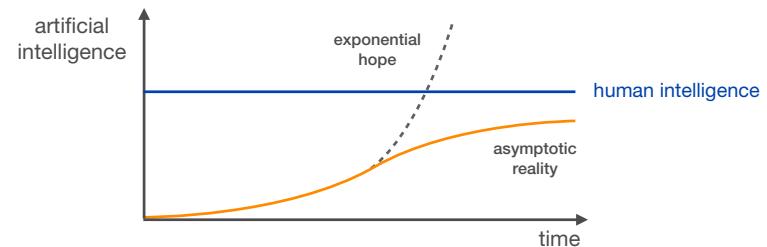
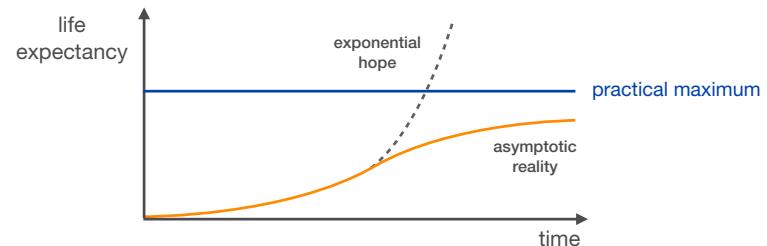
invisible barriers to AI?



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invisible barriers to both?



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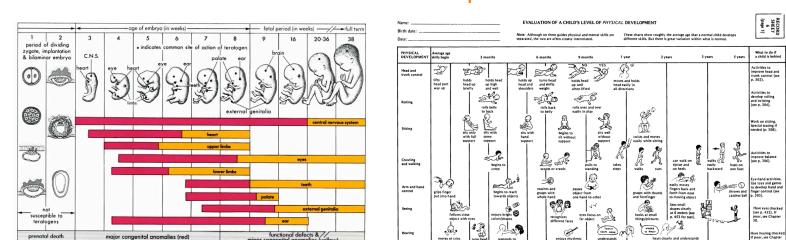
reasons for opportunity

- engineering freedom
- regulatory freedom
- underexplored

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engineering freedom



AI: a blueprint



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regulatory freedom

biotech: heavily regulated

Average time to new drug: 10 years

Average cost per new drug: \$1.3B



FDA regulatory affairs: 3,895 employees

AI: no regulation

Average time to launch new software: < 1 year

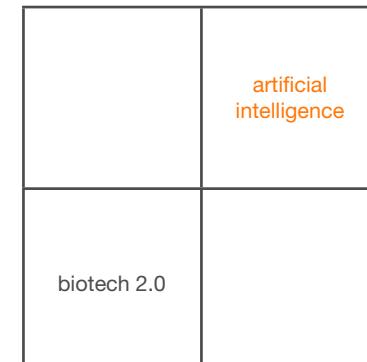
Average cost to launch new software: < \$1M

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underexplored

under-explored



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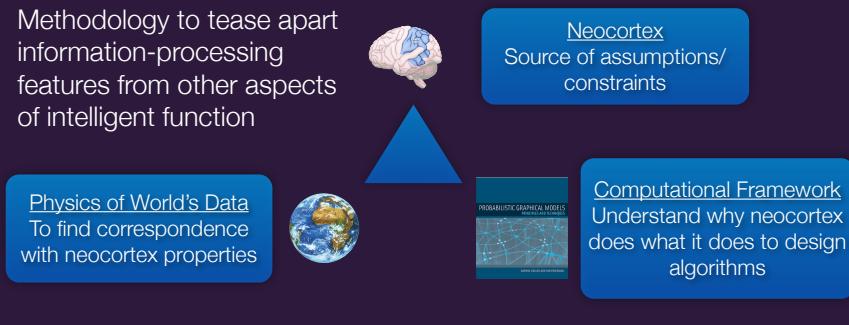


Mission

Build strong AI to help humanity thrive.

Approach

Methodology to tease apart information-processing features from other aspects of intelligent function



Strategy for AI

1 Look to the brain.

Given only the sensory data your brain received since birth, any AI must, as a minimum, develop the same capabilities.

2 Start with vision.

Language and higher level concepts depend on solving at least one sensory domain. Vision is also easier to debug and commercialize than other senses.

3 Don't commercialize too early.

Most AI companies try to build products before they solve the core algorithmic challenges of intelligence.



The world is drowning in data

New Ways to Exploit Raw Data May Bring Surge of Innovation, a Study Says

For Today's Graduate, Just One Word: Statistics

By STEVE LOHR
Published: August 5, 2009



But there isn't enough human intelligence to understand it.

Coursera Train more humans?
Coursera—100k people took Stanford machine learning

kaggle Make the humans compete!
Kaggle—farm tasks out to individuals

cloudera Make the computer faster!
Cloudera—throw processing power at the problem

How can we automate the process?

Prior Knowledge invented a box that finds causes in data



How?

Everyone knows Bayes' rule

- Universal mathematical rule for learning the causes of data
- Widely held to be intractable for real problems

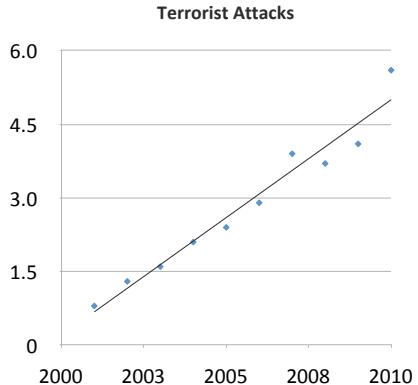
PK makes it work

- Deep tech lets it scale larger than anyone believes
- Mathematical simplicity makes the *interface* simple too
- A simple interface puts the tech everywhere

(Know Python or Ruby? Try it for yourself. <http://dev.priorknowledge.com>)



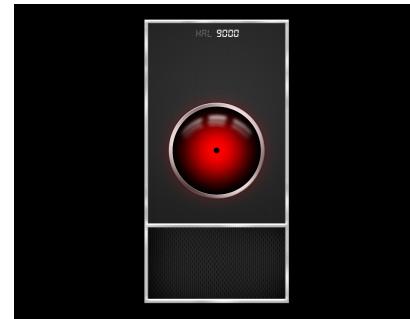
Stop thinking
Machine Learning



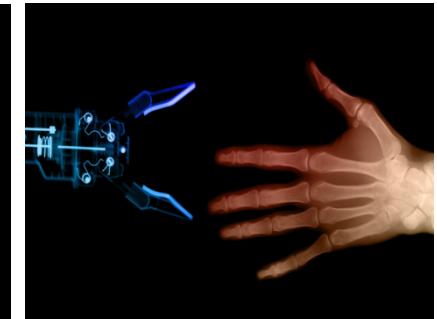
Start thinking
Game Theory



Stop thinking
Artificial Intelligence



Start thinking
Intelligence Augmentation



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