

Artificial Intelligence

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Agenda

- The grave difficulties we face.
- The path forward.

Difficulty #1: Definitions

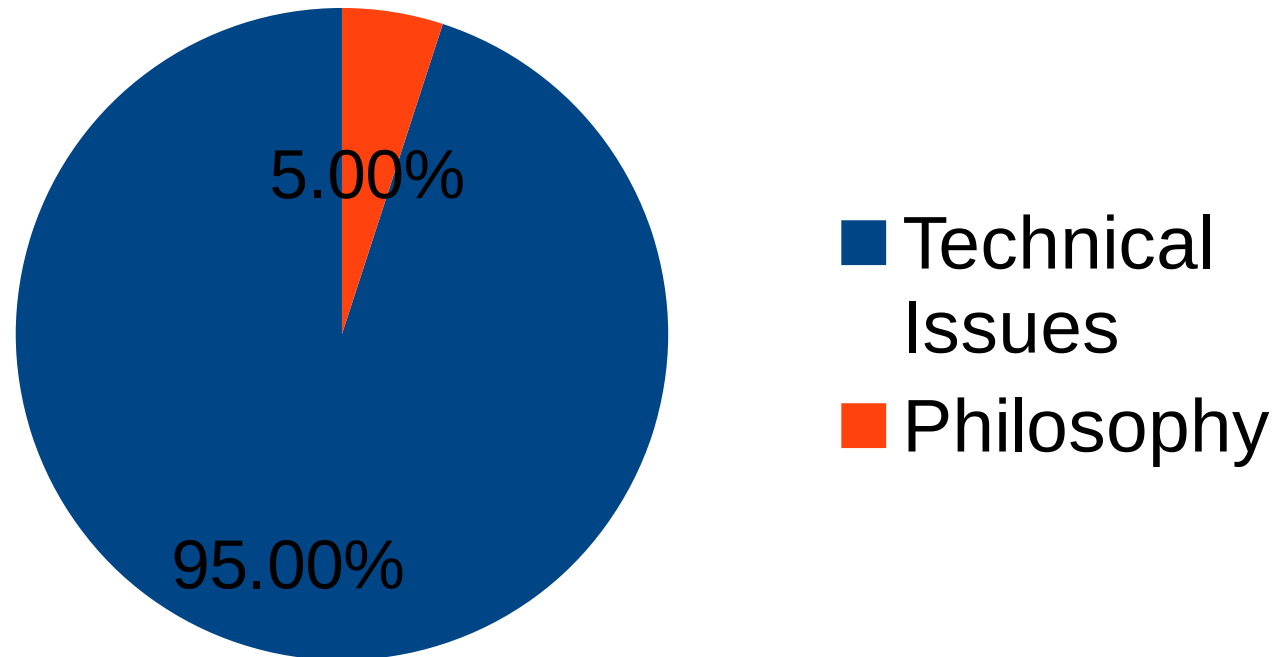
- Even defining AI raises thorny/interesting philosophical questions:
 - How do we define intelligence?
 - What is the connection between intelligence and consciousness? (if any)
 - Is it possible for a machine to be intelligent (or conscious)?
 - If we *can* create intelligent computers, *should* we?

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- First step for us:
 - **Computing Machinery and Intelligence**
(Alan Turing, 1950)



The Mix for This Course



Difficulty #2: AI is a Mess

Problem Domains

Algorithmic Approaches

	Computer Vision	Robotics	Natural Language Understanding	Artificial Creativity	...
Graph Search					
Logic					
Constraint Satisfaction					
Probabilistic/ Statistical methods					
Planning					
Control Theory					
Machine Learning/ Neural Networks					
...					

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- Once a problem is solved it no longer counts as AI
- The problems that are left are often *fundamentally* hard

A Bit of History

- *Shakey the Robot* (1969)
- *The Thinking Machine*
- Also check out:
The Quest for Artificial Intelligence
Nils Nilsson, 2010.

What Went Wrong?

- Today's computers are (very roughly) one million times more powerful than those available in 1970.

Boom/Hype (?)

“Over the past four years, six companies in particular — Google, Facebook, Apple, Amazon, Microsoft and the Chinese firm Baidu — have touched off an arms race for A.I. talent, particularly within universities. Corporate promises of resources and freedom have thinned out top academic departments. It has become widely known in Silicon Valley that Mark Zuckerberg, chief executive of Facebook, personally oversees, with phone calls and video-chat blandishments, his company’s overtures to the most desirable graduate students. Starting salaries of seven figures are not unheard-of. Attendance at the field’s most important academic conference has nearly quadrupled.”

[The Great A.I. Awakening](#), NY Times Magazine, GIDEON LEWIS-KRAUS DEC. 14, 2016

The Plan

- In one semester we can:
 - Develop a sense for why the problems are hard
 - Focus on foundations

The Plan

- In one semester we can:
 - Develop a sense for why the problems are hard
 - Focus on foundations
- The good news:
 - All other areas of CS are pointless and boring in comparison to AI.