What is AI?

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Some material used from:
1. Russell/Norvig, AIMA
2. Stacy Marsella, CS4100
3. Seif El-Nasr, CS4100
4. Amy Hoover, CS4100

What is AI?

- Historical perspective:
  - *Handbook of AI: the part of computer science concerned with designing intelligent computer systems, that is, systems that exhibit the characteristics we associate with intelligence in human behavior*

- Thoughts on this definition?

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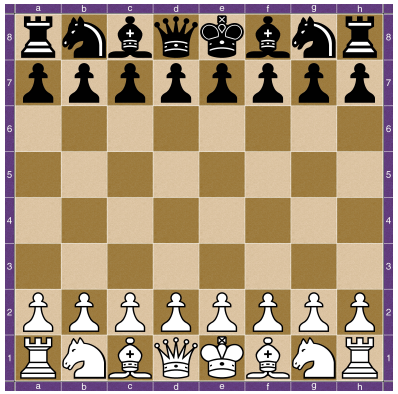
- **Which is harder? Why?**

Decide on moves



VS

Recognize pieces and move them

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- What we think requires intelligence is often wrong
  - *Elephants don't play chess, Rodney Brooks*
  - *People perform behaviors that on the surface seem simple* ***since they require little conscious thought.***
  - *Eg. Recognizing a friend in a crowd.*

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- It’s a moving Target: once we come up with an algorithm or technology to perform a task, we tend to re-assess our beliefs that it requires intelligence or is AI
  - *Beating the best human chess player was a dream of AI from its birth*
  - *Deep blue eventually beats the best*
  - *“Deep Blue is unintelligent because it is so narrow. It can win a chess game, but it can't recognize, much less pick up, a chess piece. It can't even carry on a conversation about the game it just won. Since the essence of intelligence would seem to be breadth, or the ability to react creatively to a wide variety of situations, it's hard to credit Deep Blue with much intelligence.”* ***Drew McDermott***

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- Wrong approach: The algorithm or technology may not seem intelligent

  - *Deep Blue relied on high speed brute force search*
  - *Raised the question: Is that how people do it?*
  - *Why not?*

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Moral: What tasks we think are the hallmark of intelligence has been in flux since the dawn of the industrial age.

What is AI?

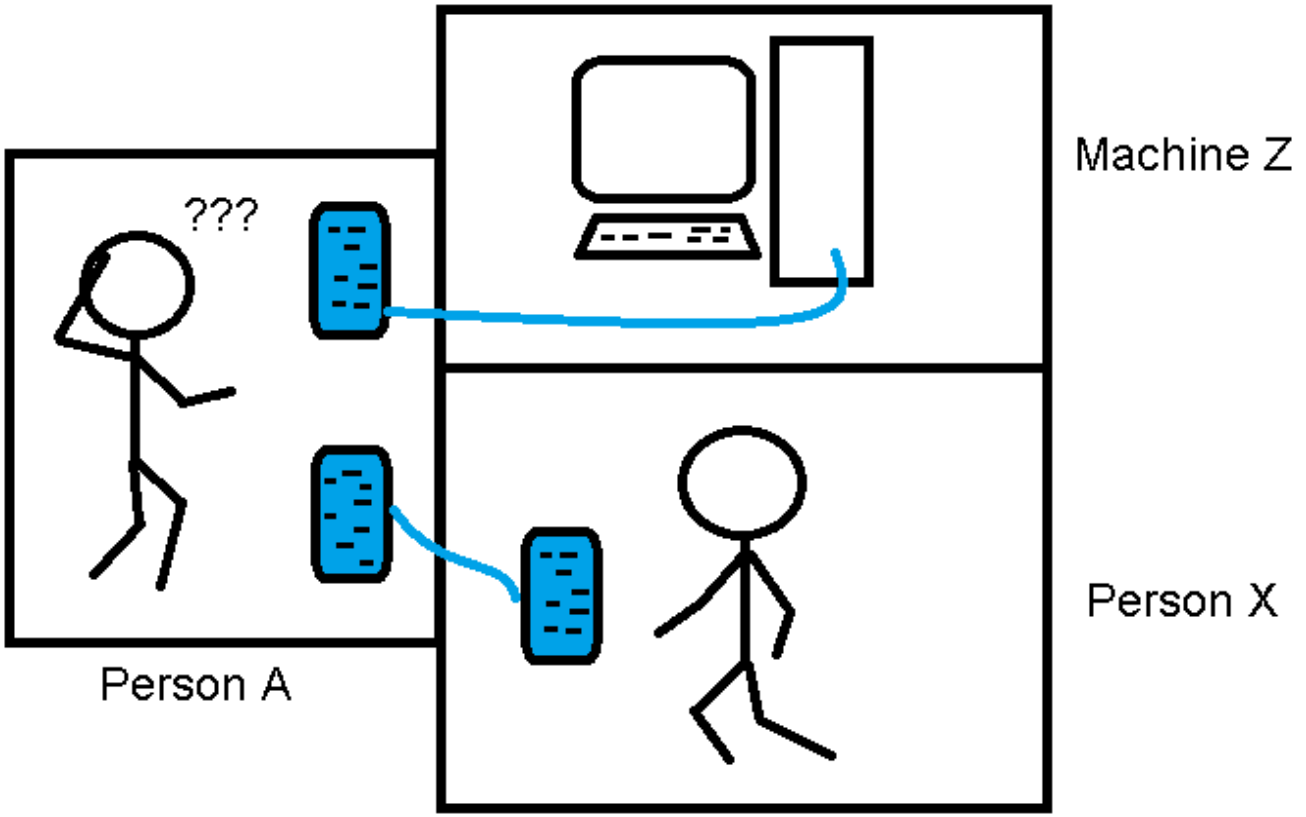
Russell & Norvig: Views of AI fall into four categories:

Thinking Humanly	Thinking Rationally
Acting Human	Acting Rationally

The textbook organized around "acting rationally”

but lets consider the others as well…

Measuring Intelligence: Turing Test



Measures whether a computer acts like a human

Turing Test

What is needed to pass Turing Test?

- Natural language processing: to communicate with examiner.
- Knowledge representation: to store and retrieve information provided before or during interrogation.
- Automated reasoning: to use the stored information to answer questions and to draw new conclusions.
- Machine learning: to adapt to new circumstances and to detect and extrapolate patterns.

ELIZA (1966)

Shallow emulation of a Rogerian Psychotherapist:
(Rogerians help client express their feelings without judgement)

Person : Men are all alike.
ELIZA : In what way?
Person : They're always bugging us about something or other.
ELIZA : Can you think of a specific example?
Person : Well, my boyfriend made me come here.
ELIZA : Your boyfriend made you come here?
Person : He says I'm depressed much of the time.
ELIZA : I am sorry to hear that you are depressed.
Person : It's true. I am unhappy.
ELIZA : Do you think coming here will help you not to be unhappy?
Person : I need some help, that much seems certain.
ELIZA : What would it mean to you if you got some help?
Person : Perhaps I could learn to get along with my mother.
ELIZA : Tell me more about your family

ELIZA and the Turing Test

People conversing with Eliza sometimes thought they were talking to a human.

– *So did Eliza pass the Turing Test?*
– *Not tested in the format that Turing proposed.*
– *Still, people quick to attribute attributes to the machine*

Maybe in a real Turing Test a relatively simple computer program can ‘trick’ the interrogator as well?

– *Loebner Prize*

Beyond Chatbots

http://www.youtube.com/watch?v=oG-2qr78GbE&playnext=1&list=PLSVPS6u0z0xfa7Xml9TKLv6IWcHF5cNBc&feature=results_main

Total Turing Test

The original Turing Test (the TT) measures human/computer similarity in terms of verbal responses.

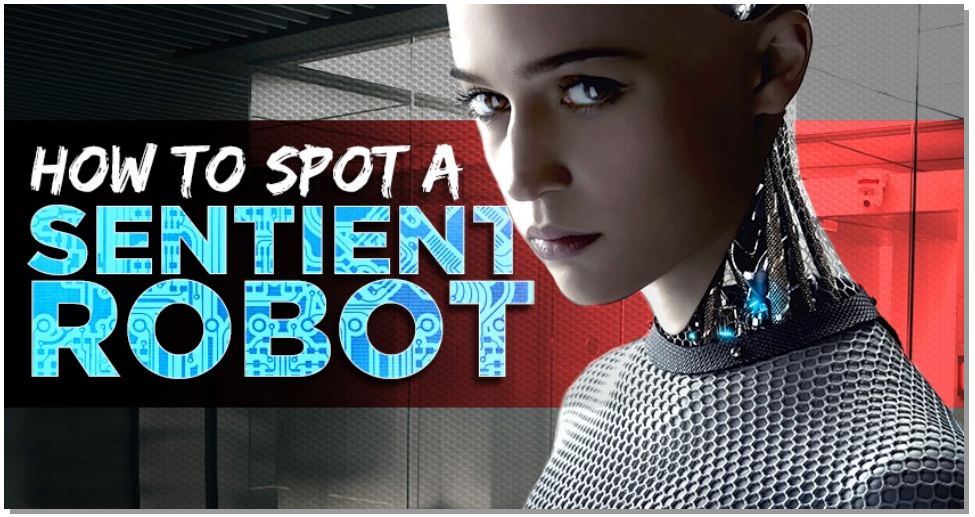
– criticized for being too limited.

So, measure similarity of other capabilities as well:

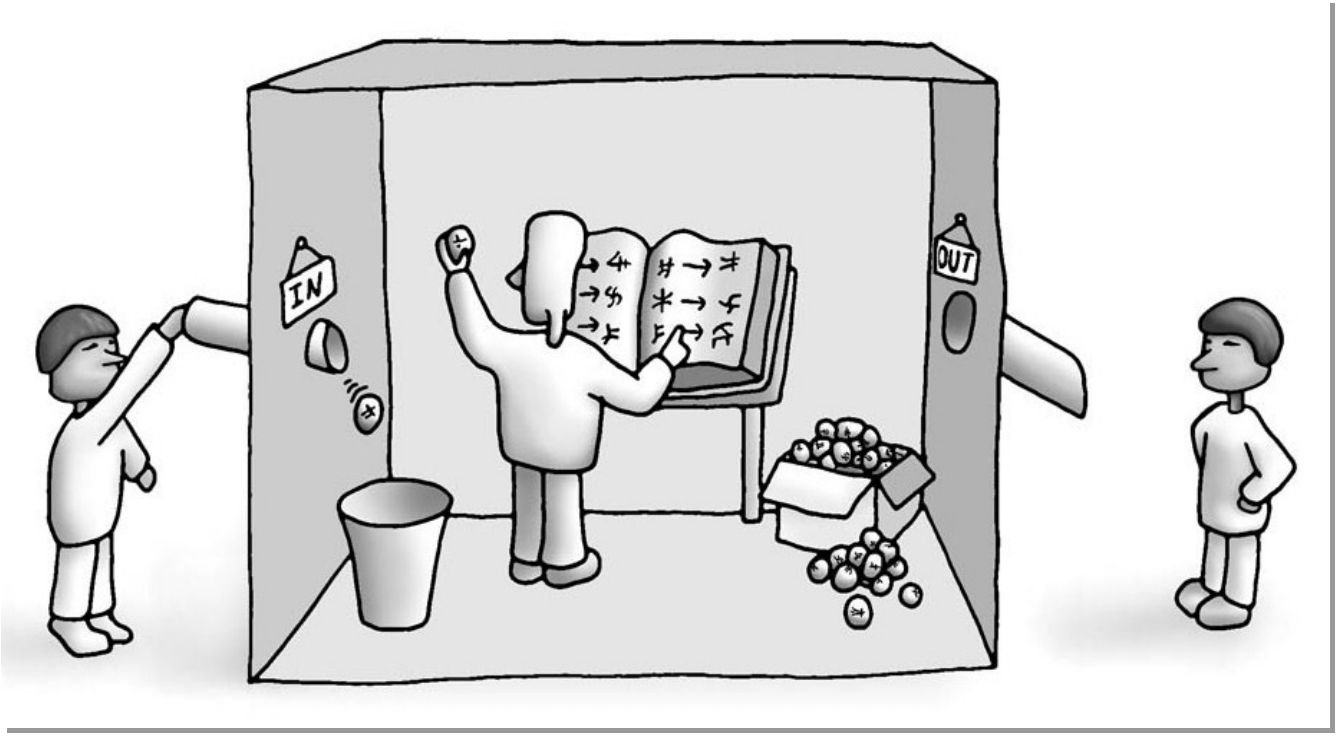
– how similar is computer vision to human vision?

– how similar is computer manipulation to human manipulation?

– etc.



Searle's Chinese Room



Suppose we are given a program that passes a Chinese version of the Turing Test

Suppose a human executes the program instead of a computer

Does the human *really* understand Chinese or is he just *simulating* that ability?
– *strong AI* vs *weak AI*