

# **CPS 270: Artificial Intelligence**

<http://www.cs.duke.edu/courses/fall08/cps270/>

## **Wrapping up**

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# What are the boundaries of AI?

engineering  
probability &  
statistics algorithms &  
economics AI complexity  
psychology & logic  
neuroscience philosophy linguistics  
...

- **AI benefits from lots of other disciplines**
  - Perhaps especially in recent history (stats, econ, cs theory)
  - Results in better work than reinventing the wheel
- In turn, AI has made contributions to all of those disciplines

# Why have AI at all?

- Can't AI just be split up and redistributed among the other disciplines?
  - A suggestion that has been made in the past...
- AI provides a useful, important **goal/perspective**
- AI applications often need **multiple** of these fields at the same time
- Sometimes fields get too caught up in a particular way of evaluating what makes for “high-quality work”
  - Prevents interdisciplinarity

# What makes something “AI”?

- Very few AI researchers actually work directly on (say) passing the Turing Test
- Most work focuses on specific applications
- Are the following AI? (Are they computer science?)
  - Fast algorithms for satisfiability
  - Ranking webpages
  - Disease outbreak detection based on pharmacy sales
  - Placing airport security assets in a game-theoretically optimal (randomized) way
  - Constructing 3D models from 2D images
  - ...

# One opinion

- Boundaries of scientific and mathematical fields are blurry
- We need to divide things into disciplines for...
  - Teaching courses,
  - Having conferences,
  - Allocating funding, ...
  - **Cognitive convenience**
- The best division is the one that results in the best research and education for society
- A good scenario:
  - Thanks to its unusual perspective, AI connects ideas from different disciplines, contributes new ones, and points in a new, worthwhile direction
- A bad scenario:
  - AI researchers are not aware of other disciplines and are just pointlessly reinventing wheels

# A return to the bigger goals of AI?

- Some AI researchers (perhaps especially, senior researchers) think AI has become too fractured, too special-purpose
- A politically correct pitch:
  - This was a necessary stage for AI research...
  - ... we needed to learn about and understand all these special-purpose methodologies...
  - ... but now it is time to tie it all together again and build something with human-like intelligence
- Human brain also seems to have lots of special-purpose modules, but very nicely integrated...