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CS380

Assignment 1

1. Watson

- Other than Jeopardy, do you see other application domains for Watson?

I searched Wikipedia to find other application domains for Watson. Wikipedia lists Other Application Domains for Watson. It is used in various fields such as IBM Watson Health, Chefs Watson, Chatbot, and Teaching assistant.

https://en.wikipedia.org/wiki/IBM_Watson#Current_and_future_applications

- Chess is considered a game for intellectuals, while Jeopardy is a game for the masses. Why do you think then that it's harder to create an AI system that plays Jeopardy than to create a system that plays Chess?

I thought that for Watson to understand the language that humans use, it would require much more complex calculations and data than simply moving chess pieces on a chessboard. As the article said, Jeopardy requires understanding ambiguity, irony, wit, and double meaning as well as riddles and puns. To do so, it will require complex codes, such as contextual understanding or real-time information processing capabilities. Additionally, to improve AI performance, massive amounts of data must be stored, and building such storage facilities will require enormous funds. The article said that Watson was operated by storing a massive amount of information, 15 trillion bytes.

 However, since chess moves only within a set chessboard and according to set rules, it would still require a lot of calculations, but it is within the range that can be sufficiently calculated with the advanced performance of computers.

- You sure have seen this XKCD entry http://xkcd.com/1002/. Is there any game there that you consider out of place?

In my opinion, AI has already defeated humans in Go. It has already defeated the strongest Korean and Chinese Go players at the time in 2016 and 2017. More than 7 years have passed since then, and I think there are many AIs that are much stronger than AlphaGo.

2: Problem Definition

Small towers of Hanoi

- Performance Measure
  1. Successfully move all disks from the initial rod (R1) to another rod (R2 or R3) following the rules.
  2. Minimize the number of moves.
- Environment
  1. Three rods: R1, R2, R3.
  2. Three disks: D1 (small), D2 (medium), D3 (large).
- Actions
  Move the top disk from one rod to another, following the rules
- Sensors
  1. Detect the top disk on each rod
  2. Detect the size of the disks on each rod
  3. Detect the state of the rod (empty or not)

Pac-Man

- Performance Measure
  Eat all the pellets

- Environment
  A rectangular grid where each cell can contain a wall, a pellet, Pac-Man, or nothing

- Actions
  Move up/down/left/right

- Sensors
  1. Detect Pac-Man's current position.
  2. Detect the presence of pellets in the current cell.