

Intro to AI (331)
Homework 01
Borrelli
Due: Wednesday, June 2nd, 2021 by 11:59pm EDT

- Be sure to put your NAME and Section number on the first page.
- You must submit your solution to MyCourses in **PDF** format **only**.
- Late work is not accepted.
- Only the last thing submitted to the dropbox will be accepted.

1. **(6 Points)** Describe and explain difference between:
 - (a) Strong and Weak AI
 - (b) Strong and Weak Methods
 - (c) Neats and Scruffies

2. **(5 Points)** Many of the computational models of cognitive activities that have been proposed involve quite complex mathematical operations, such as convolving an image with a Gaussian or finding a minimum of the entropy function. Most human (and certainly all animals) never learn this kind of mathematics at all, almost no one learns it before college, and almost no one can compute the convolution of a function with a Gaussian in their head. What sense does it make to say that the “vision system” is doing this kind of mathematics, whereas the actual person has no idea how to do it?

3. **(5 Points)** “Surely computers cannot be intelligent — they can only do what their programmers tell them.” Is the latter statement true, and does it imply the former?

4. **(5 Points)** “Surely animals cannot be intelligent — they can only do what their genes tell them.” Is the latter statement true, and does it imply the former?

5. **(5 Points)** Briefly describe the issue of intractability (NP-completeness, or “difficult” computational problems) as related to Artificial Intelligence.

6. **(10 Points)** List and describe at least five techniques that can be used to cope with intractability (they do not have to be AI techniques per se) and for each technique, explain the advantages and disadvantages of the approach.
7. **(4 points)** Describe the “Turing Test” for intelligence.
8. **(5 points)** I.J. Good (and others) make the claim that intelligence is the most important quality, and that building ultraintelligent machines will change everything. A sentient cheetah counters that “Actually speed is more important; if we could build ultrafast machines, that would change everything,” and a sentient elephant claims “You’re both wrong; what we need is ultrastrong machines.” What do you think of these arguments?
9. **(5 Points)** Some critics object that AI is impossible, while others object that it is inevitable and that ultraintelligent machines pose a threat. Which of these objections do you think is more likely? Would it be a contradiction for someone to hold both positions?