CS7637: Assignment 3

Assignment: DARPA BAA

Please choose **any 2** of the topics listed below to complete this assignment.

* Incremental Concept Learning
* Planning
* Common Sense Reasoning
* Explanation Based Learning
* Analogical Reasoning
* Meta-Reasoning

Your response should be capped at 1000 words and may be augmented with diagrams, UML charts and/or pseudocode.

On September 28, 2018 DARPA announced a Proposers Day to provide information to potential proposers on the objectives of the anticipated Machine Common Sense (MCS) Broad Agency Announcement (BAA). You may read the full text of the announcement by following [this link.](https://drive.google.com/open?id=1HGQeXBfF2ULT_YrRBiftv0Il1ItJW5pb) This initiative has the potential to shape the direction of research for the next decade and beyond.

For the purpose of this assignment consider the following sections of the document:

The MCS program proposes to take on the common sense problem by pursuing two diverse strategies to develop two different commonsense services, each with its own evaluation method:

* Foundations of Human Common Sense (Technical Area 1): to learn from experience, like a child, to construct computational models that mimic the foundational core knowledge systems of human cognition for objects (intuitive physics), agents (intentional actors), and places (spatial navigation).
* Broad Common Sense (Technical Area 3): to learn from reading the Web, like a research librarian, to construct a commonsense knowledge repository capable of answering natural language and image-based queries about commonsense phenomena.

Your job is to design a system that loosely satisfies either of the bullet points above. First, choose a problem that you have faced in your life that you think could be addressed by AI. This could be a problem you face at work, a problem you face in another class you’re taking, a problem you face in your everyday life, or a problem relevant to the AI community. Then, design an agent that can satisfy at least one of the conditions below:

A. Learns from experience, like a child to have a general understanding of how the physical world works (i.e., intuitive/naïve/folks physics).

B. Acts on the world as an intentional actor that incorporates an understanding of human motives and behaviors learned from experience (i.e., intuitive psychology).

C. Solves the problem of spatial navigation in an environment to which it is naïve.

D. Learns from reading the Web, like a research librarian, to construct a commonsense knowledge repository capable of answering natural language and image-based queries about commonsense phenomena.

As you can see, the list very broad and we will accept assignments on any topic that satisfies one of the conditions above (however broadly). The key to doing well is showing your mastery of any two of the lecture topics listed above in a coherent, feasible design.

Submission

Assignment 3 should be submitted as a PDF. Most modern word processors allow you to save a document as a PDF. If yours does not, we recommend copying or uploading your assignment to Google Docs and downloading it as a PDF. There also exist other freely-available PDF converters online.

To submit Assignment 3, go to the assignment submission page in Canvas, upload your document, and click submit. All submissions must be received by the due date and time. Late work will **not** be accepted, although we have built in a little lag time in Canvas to account for slow upload times. Please see the syllabus for more information on the course late policy.

Grading

Your assignment will be graded according to five criteria. Each criterion will be evaluated on a scale of 1 to 5:

1. How well does the assignment describe the problem it is attempting to solve?

2. How well does the assignment articulate its design for a solution to the problem? (Diagrams, UML charts and pseudocode can be very helpful to get full credit for this question)

3. How well does the assignment leverage the chosen topic or topics in designing that solution? How well does the assignment expand on the description of the topic or topics that was presented in the lecture? In other words, how well does the assignment demonstrate understanding of the topic, not just repetition of its vocabulary?

4. What are the strengths and weaknesses of your design? What are its shortcomings? What kind of problems/edge cases does the design not work for? Why is this so?

5. How well does the assignment actually solve the problem? Is the solution proposed by the assignment feasible?

Thus, assignments will be scored out of 25. It is important to note that a 90% should not be considered the threshold for an “A”. Make sure to check the stats posts at the conclusion of each assignment to see the class distribution and understand your grade.

Peer Review

After each assignment, you’ll be asked to give peer feedback to three other students in the class via Peer Review. You’ll receive your peer review assignments the day after the assignment is due, and you’ll have until the following Sunday to submit your peer feedback. Peer review is worth 10% of your grade, and your participation in peer review will be graded based both on completion of the activities and on the quality of your feedback, as judged by both the TAs and your peers.

References

If you borrow any ideas, text, diagrams, figures or images from any outside source, it is extremely important that you properly attribute credit for that work.

All sources must be cited using the APA format for citations.

1.     If you are quoting directly from another source, the passage that you are including in your paper must be surrounded by quotes and the author’s name, year of publication, and page number must appear in parentheses immediately following the quote in the body of the paper.

        Example: “This is the text you are citing”(Author, 2016, p. 1).

2.     If you are paraphrasing from a source, the relevant passage must be followed by the author’s name, year of publication, and page number in parentheses in the body of the paper.

        Example: This is a paragraph you are paraphrasing (Author, 2016, p. 1).

3.     If you are copying a diagram, figure or image, the author’s name, year of publication, and page number must appear in parentheses immediately following the figure caption.

        Example:

|  |
| --- |
|  |

        Figure 1. Blank Figure (Author 1, 2016, p. 1)

4.     In addition, any citation must be accompanied by the appropriate reference on the reference page at the end of your document. Please review the rules for proper APA references at one of these websites:

<https://owl.english.purdue.edu/owl/resource/560/01/>

[http://www.umuc.edu/library/libhow/apa\_examples.cfm#intext](http://www.umuc.edu/library/libhow/apa_examples.cfm%23intext)

<http://www.citationmachine.net/apa/cite-a-book>

        Example of a Journal article:

Author, A. A., Author, B. B., & Author, C. C. (Year). Title of article. *Title of Periodical,*

*volume number*(issue number), pages.<http://dx.doi.org/xx.xxx/yyyyy>

        Example of a book:

Author, A. A. (Year of publication). *Title of work: Capital letter also for subtitle*.

       Location: Publisher.

        Example of a website:

Author, A. A., & Author, B. B. (Date of publication). *Title of document*. Retrieved from

http://Web address

We understand that all the relevant information may not always be available for every source (especially web resources). Please do your best.

We also understand that APA has a myriad of rules and we do not expect you to become an APA expert in this class. If you miss a coma somewhere, or do not skip a line where necessary, you will **NOT** be penalized. However, if you use a portion of someone else’s work and do not include an in-text citation and a corresponding entry in the reference page, we will consider it plagiarism and refer your case to the Office of the Dean for disciplinary action.