

CSCE625: Artificial Intelligence

Communication Project

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Introduction

This is an assignment in which the primary skill being assessed is your ability to communicate. Communicating technical aspects of what you have learned is a vital ability. I can promise you that it will stand you in good stead for your whole life.

Assignment Overview: Think about a technical problem and solution that incorporates Artificial Intelligence methods. Then communicate this problem, covering the main features of the topic, as effectively as you can. If possible, you should pick something (1) related to any ongoing research or other projects, or (2) already of interest to you, for example: AI for chatbots, AI in one of your favorite games (e.g., poker playing agents, the AI in starcraft), Wall Street trading, ethics questions in AI, *etc.* You can tackle some AI-relevant problem, write code for it, and explain what you did as well as what you learned—but it is not necessary for you to pick something involving programming.

There are two modes that are possible:

Video: If the topic and/or your approach to the topic can benefit from audio and dynamic visuals, then record a brief video. Recommended form: about 3–5 minutes in length, with spoken dialog and supporting visuals or animations. (See examples below.) You can make this video amusing, or serious; primarily informative, controversial, or creative. Pick what suits your message and your own style.

Paper: If you prefer, you can write a paper on your topic. There are two forms that make sense, depending on your intended content:

1. Technical paper. Recommended form: 5–7 page paper in AAAI/IEEE two-column format. (The E-Graph and D*-Lite papers are both examples in this format, albeit a bit longer than would be expected.)
2. Essay. Recommended form: single-column single-spaced essay, ideally ± 4000 words. You might consider Robert French’s “Subcognition and the Limits of the Turing Test” as an example, though it is slightly longer than that.

Individual vs. group: Teams of up to two students are permitted for the video format; but these can also be done individually. When two people work together, the video will be graded as a group effort, so incorporate input (even if only one person is recorded as speaking) from each team member. If you have a particular ambitious topic, which you think justifies more people, please speak with me.

(It is intended that the paper form will be an individual paper but I am willing to make an exception for special circumstances, if you're open to speak with me about what you have in mind.)

Topic

You have a very wide choice of topic. Anything that is of particular interest to you that has been covered in the course, is covered in the textbook, or can be shown to relate in a technical way, is a fair choice for a topic. You could focus on one of the papers that has been discussed in class, or follow up on one of the papers cited therein, or the topics that have been mentioned or items linked off the course website. However, note that an important part of what you will be expected to communicate is the problem statement. Do not assume that you can skip over the motivation for the problem: the audience for your talk may understand AI but may know little about the problem, or even understand what it entails. It is up to you to convince them of the importance of the problem and to illustrate the problem in an accessible way.

It is important that the topic actually relate to AI problems, other approaches, or philosophy in non-trivial way. The one purpose of your video/paper is to emphasize this relationship. **If you are in doubt, ask me about your idea.**

The assignment

The aim of your communication project is to describe a technical problem and an AI-based solution to that problem to a public audience. You have freedom in the scope of the problem, and the level of detail described, but you should choose wisely. A good model of a potential reader is an intelligent but uninformed person who may have heard of the terms “Artificial Intelligence” but may not be intimately familiar with notation or specialized details of particular algorithms. Thus, you should limit use of jargon or specialist language where possible. You can choose to have the video have a serious tone, or a more whimsical style can also be used—especially if you think it might be more engaging.

This is a difficult project, which is one of the reasons this is included in the course. So you will want to consider using more than plain prose. Visualizations (plots, figures and images, or in the case of the video: animations) can be used to great effect to explain particular instances of the problems. So put some time into thinking about supporting figures or animations.

Examples of videos

Here is an example of an excellent, fun, educational video (on a mathematical topic, although not on an AI topic) which might inspire you: *Hexaflexagons*: <http://youtu.be/VIVIEgSt81k> Also an economics themed example: *Keynes vs. Hayek*: <https://www.youtube.com/watch?v=d0nERTFo-Sk>

Here are some previous submissions for the course. They vary in quality:

F.E.A.R. Game AI (Joanne Bruno and Sara Fox)

<https://www.youtube.com/watch?v=-T5SWC4Vg50>

Automatic Speech Recognition with Hidden Markov Models (Hira Chaudhary)

<https://youtu.be/i10mkVUKf0w>

AI in Mobile Systems (Angel Lozano)

<https://vimeo.com/146889783>

How does a computer play chess? (Kevin Shell)

<https://youtu.be/tk4yW2nCc5Y>

Navigation in Realtime Strategy Games (Garrett Witowski and Kyle Wahl)

<https://youtu.be/UgW3MpWXOzQ>

Training your cooking robot (Eric Cochrane)

<https://youtu.be/bFDymzWzLAM>

Self-Driving Cars (Steven Snow and Chris Martin)

<https://www.youtube.com/watch?v=WEqk2kljo9w&feature=youtu.be>

AtomNet (Isabel McClure)

<https://youtu.be/ZP16F8tASvQ>

A short look into Alien Isolation's AI (Clayton Stuhrenberg)

<https://youtu.be/Zvigx1mPP3U>

If you choose to the video: you do not have to submit a written report. All that is needed is to post a link to a video.

Evaluation

Because submissions to communications projects involve a great variety of creative thought, demonstrate artistic expression, and differ so widely, no single rubric with checkboxes does them all justice. However, these are some questions that I consider when grading your project:

1. Is there a clear motivation of a problem being solved by AI?
2. Are the ideas that fall within the purview of AI identified?
3. Is every statement technically correct?

4. Does the project have a good introduction, middle, and conclusion?
5. Does the project show a solid grasp of the core technical concepts?
6. Have the contributions been positioned appropriately historically? *e.g.*, are the researchers who developed the idea identified?
7. Are visuals (either in the video, or figures in the paper) of high quality? Do they complement or expand understanding?
8. If philosophical issues (*e.g.*, thought experiments) or broader societal implications (*e.g.*, ethics) are considered in the presentation, are the issues identified and described in a crisp fashion?
9. Has extra effort gone into making it engaging, *e.g.*, is it especially novel, humorous, entertaining, provocative?

Submission

We have a three-cycle model. First you prepare a draft, which is submitted. It is then peer reviewed. Finally, you submit your final version. The “draft” should be of the following form:

Video: You should have a clearly identified and delineated topic, along with some written narration (or dialogue if more than one person is speaking). Also, a storyboard of some rough sketches of envisioned diagrams or illustrations.

Paper: You should have an introduction giving the description of the topic, motivation, and/or abstract. In addition, for the remaining yet to be written sections, you need a broad but clear organization for the document (*i.e.*, a writing plan) at the level of individual paragraphs.

In more detail: these are the specific phases of this project along with a timeline:

- ▷ Read this assignment.
1. Decide on a topic, format (and, if applicable, a teammate).
 2. Submit a draft of your communication assignment. (5 April)
 - ▷ You will be assigned two drafts from your classmates.
 3. Submit a review and constructive critique of the drafts. (12 April)
 4. Submit your final communication assignment. (3 May)