

OVERVIEW: Your culminating project for this course will be a 3–5-page investigative report on an AI-based technology of your choice. This technology should be meaningful to you, allowing you to explore the application of AI technologies in your major, anticipated profession, or your daily life. You may choose a tool that you interact with regularly or one that would like to learn more about. But please do not choose an off-the-shelf large language model (LLM) such as ChatGPT, Gemini, or Claude, as they appear unmodified on the web. If you are interested in LLMs, instead you should focus on a technology that incorporates them or refines them in some more domain-specific way towards use in a target domain or application.

You should use a minimum of six sources to write your report, and reflect a full understanding of them in what you submit. Of these, you should include three different types of references:

- Course readings: Cite a minimum of two of the main course readings in your report.
- Peer reviewed research paper: Use a literature search tool to find at least one peer reviewed article or conference paper specific to your technology and read it carefully; and
- Informal/popular source(s): Include information from at least **one** informal source. These may be news article(s), blog(s), podcast(s), video(s), etc. This requirement is not meant to be restrictive; this source should help you connect your report to recent news. This informal source(s) may examine your specific technology, a similar technology, ethical considerations related to AI, societal impacts, etc.

SPECIFIC GUIDELINES: You should frame your report using the following sections. Please list each heading title (labeled with a Roman numeral) in bold, on its own line in your paper. Below the heading, address the subtopics/questions in paragraph form, written in your own words. Be sure to adhere to any length requirements specified.

Please note: Any paper submitted without headings will not be graded. The paper may be resubmitted with headings, and will be subject to a late penalty.

After writing the report completely in your own words, we encourage you to use grammar-checking and other AI-based tools to improve the clarity of your expression. If you do, please:

- Submit your original draft below the final version, and
- Check carefully to make sure that the final version fully reflects your own opinions and understanding of facts.

PAPER SECTIONS (be sure to include headings as described above):

I. **Technology Description**

- In your opening paragraph, give the name of technology (include a URL if appropriate).
- In about 2–4 sentences, provide a detailed description of what the technology does
- Discuss the main application(s) of this technology.
- Include at least one sentence explaining why this technology is of interest to you.

II. What makes this an AI-based technology?

- Describe how this technology uses AI by connecting it to the main definition of AI used throughout the semester.
- Elaborate on the first bullet by tying the technology to AI paradigms and what is/is not AI. These two bullets should be a well-developed paragraph of at least 5 sentences.
- Describe the AI techniques employed to create your technology. This may require you to discuss the application of classical AI techniques (e.g., tree search, rule-based algorithms, automated planning). In Weeks 7 and 8, we discussed the foundations of machine learning. If your chosen technology incorporates machine learning, then in a well-developed paragraph, connect your selected technology to concepts from these lessons.

III. Strengths and limitations

- What does the technology do well? Discuss this and ways the technology could be improved.
- Summarize the major risks and benefits of this technology. Address realized and potential risks to society, specific groups, and/or individuals.

IV. Addressing risks

- Choose one risk from section III to discuss in detail. Clearly restate your chosen risk in the first sentence of your first paragraph.
- In Weeks 1–4, we watched a series of videos on ethics in AI by Dr. Fleishman. Connect this risk to ethical frameworks discussed in these lectures.
- Discuss the potential perspectives of different stakeholders and individuals that could be impacted. You may choose to reflect on any personal biases as well.
- Discuss ways to mitigate the risk you selected. Suggest some practical solutions and discuss the ethics of these solutions.
- Describe the practicalities of enforcing such mitigations, and at what level enforcement could and/or should occur (e.g., the individual, a company, the government).

V. Improvements

- In this paragraph, suggest ways that the AI technology could be improved.
- **Reflect on the AI techniques employed** (e.g. search, planning, probabilistic reasoning, machine learning, etc.). What steps of the AI development process would need to be taken to improve the technology? **Could new machine learning techniques be employed?**

VI. Conclusion and future directions

- To begin, briefly summarize where the technology you examined, and its current status.
- Restate the key strengths/limitations/risks/benefits.
- Describe the next step for improving this technology. You may also address how future improvements will need to be addressed.

- In your opinion, what is the #1 ethical implication we must be cognizant of as this technology advances?

VII. Citations

- Please use APA format for your citations.
- Ensure that URLs are properly formatted (do not only list the link).

RUBRIC : please refer to the following criteria used to grade this project assignment.

CRITERION	Description
Technology Description	<ul style="list-style-type: none"> • Technology name and URL included • 2-4 sentence description clearly states purpose of technology • Main application described • Reason for interest stated
What makes this AI?	<ul style="list-style-type: none"> • Correctly connects technology to AI definition • Min. 5-sentence paragraph connects tech. well to AI paradigms • Correctly states AI techniques employed with descriptions
Strengths and limitations	<ul style="list-style-type: none"> • States what tech. does well / areas to improve • Major risks and benefits summarized • Discusses risks in relation to individuals / groups involved
Addressing risks	<ul style="list-style-type: none"> • Restates risk • Well-explained connection to at least one ethical framework • Perspectives of at least two stakeholders described • Practical solutions to risk presented; connected to ethics • Enforcement disc. included; clearly states who should enforce
Improvements	<ul style="list-style-type: none"> • Suggests improvements to tech. • Connects to AI techniques used • Suggests ML techniques to employ, if appropriate
Conclusion and future direction	<ul style="list-style-type: none"> • Conclusion summarizes technology & strengths / limitations / risks / benefits • Future improvements described • #1 ethical implication listed
Grammatical correctness and clarity of expression	<ul style="list-style-type: none"> • Maximum of two minor grammatical issues • Maximum of one section lacking clarity, but does not detract from the overall points being made
Citation format	<ul style="list-style-type: none"> • Includes in-line citations and a bibliography • Minimal, minor errors in citation format • URLs properly formatted
Demonstrated understanding of the references	<ul style="list-style-type: none"> • In-line citations clearly contain information from the source referenced

