

Applied AI Project

COSC 423/523: Artificial Intelligence
Fall 2021



THE UNIVERSITY OF
TENNESSEE
KNOXVILLE

VII. Grading

The final grade for the course is calculated different for students enrolled in COSC 423 and COSC523. The final grade calculation will be based on the following:

COSC 423		COSC 523	
Assignment	Value	Assignment	Value
Project Assignments	50%	Project Assignments	40%
Midterm	20%	Midterm	15%
Final Exam	30%	Final Exam	25%
Applied AI Project	+5 Bonus%	Applied AI Project	20%



Overview

This project is required for all students enrolled in COSC 523. It is optional for students enrolled in COSC 423. This project requires that you:

- Pick an application domain that interests you.

<http://web.eecs.utk.edu/~acw/teaching/f21/cosc423/project.html>

Overview

This project is required for all students enrolled in COSC 523. It is optional for students enrolled in COSC 423. This project requires that you:

- Pick an application domain that interests you.
- Identify a problem in that application domain.

- Choose a project pathway.
 - **Pathway #1: AI as a Tool:** Introducing and evaluating a modification to an existing algorithm (e.g., A*), e.g. [Path Planning with Modified a Star Algorithm for a Mobile Robot](#). Projects in this pathway should:
 1. Introduce and describe a new technique.
 2. Implement the technique.
 3. Design an evaluation with empirical or simulated data.
 4. Compare the technique's performance with one existing technique.
 - **Pathway #2: AI as an Application:** Building machine learning models for a particular domain setting and evaluating them appropriately, e.g. [predicting /r/AITA votes with data from Reddit](#). Projects in this pathway should:
 1. Find or collect a dataset for machine learning use.
 2. Implement and train models with the dataset, i.e. with scikit-learn or Keras.
 3. Design an evaluation that compares the performance of multiple models.
 - **Pathway #3: AI as an Interface:** Implementing interfaces that act "intelligently" and facilitate recommendations and/or search, e.g. [Microsoft's LookOut system](#). Projects in this pathway should:
 1. Describe a scenario for integrating intelligence (e.g., recommendations) into an interface.
 2. Implement an interface prototype that demonstrates the concept.
 3. Conduct an informal user study with the prototype aimed at understanding how the new interfaces changes the nature of the application area.

Pick one.

- Prepare a proposal. Cite, at least, 5 or 6 research papers to motivate your project.
- Conduct an appropriate evaluation for your pathway.
- Write a final report about your project, its implementation, and your findings.
- Undergraduate students can form teams of up to 3 people, but graduate students may form teams of two

II. Grading

This milestone is worth 20% of your final project grade. The 20% is calculated like so:

Deliverable	Description	Value
Proposal	A written proposal exists with all required information.	2.5%
	Proposal is grammatically and structurally well-written.	2.5%
Final Report	Report articulates all aspects of project effectively.	12.5%
	Report is grammatically and structurally well-written.	2.5%

The objective of the Milestone 1 (M1) is to submit a one-page project proposal. Far too often, AI techniques and methods are applied to problem spaces that "don't matter". However, an important consideration for "what matters" is that it is inherently [debatable](#). We make thousands of decisions each day that influence us in small, but meaningful ways. Project proposals should hone in on one such decision.

I. Milestone Requirements

This milestone requires that your team successfully identify a problem you have chosen for your project. The requirements of this milestone are as follows:

1. Your team must have the instructor's permission that a topic is suitable for the course.
2. Your team's setting must be compliant with the constraints outlined above.
3. Your team must submit a one-page document, by the due date, that includes the following sections:
 - **Problem Description:** A clear articulation of the problem and the project pathway that the project falls under.
 - **Problem Motivation:** A brief paragraph describing why the problem matters.
 - **Planned Activities:** An overview of the activities that will take place during the project.

Note: Your report must be submitted by 11:59pm on October 26 via Canvas.

Milestone 1: Oct 26

The objective of the Milestone 2 (M2) is submitting a final report based on your project, its implementation, and any findings related to your project. Your document should be written with the [AAAI 2020 Author Kit](#). It is advisable that your team write in LaTeX. The easiest way to collaborate on LaTeX documents is through [Overleaf](#).

I. Milestone Requirements

The requirements of this milestone are as follows:

1. **Final Report:** Your team must submit a document in the AAAI format, by the due date, that includes the following:
 - Your document should include six sections:
 - Introduction: Describe why your project matters.
 - Approach: Describe your approach.
 - Implementation: Describe your approach.
 - Evaluation: Describe your evaluation.
 - Future Work: Describe what could follow your work.
 - Contributions: Describe the contributions of each team member.
 - The document should be, at most, 8 pages in length.

Note: Your report must be submitted by 11:59pm on November 30 via Canvas. Note that it is perfectly permissible to re-use text from prior Milestone submissions for this final report. You should aim to submit a report that is well-written and clearly articulates all aspects of your team's work.

Milestone 2: Nov 30