PROJECT – COMP 3106 INTRODUCTION TO ARTIFICIAL INTELLIGENCE

The project is an opportunity for you to select a problem you are interested in and solve it using methods from artificial intelligence. The project must involve a practical implementation to solve the problem and should include some validation of how well your solution works. The project may be in any application domain. The project must use methods from artificial intelligence; however, it does not need to use methods covered during class. The implementation may be completed using any programming language you choose.

Note that it is recommended to do a project that has some novel aspect. Implementing a well-known solution to a well-known problem is not very interesting. Consider novel variants of well-known problems (e.g. add/remove a constraint, use different dataset, pre-process that data differently, tweak a method, etc.).

The project may be completed individually, or it may be completed in small groups of two or three students. It is expected that the project should be similar in workload to approximately four assignments if completed individually. The expectations will depend on group size (i.e. expectations will be greater for groups of three students vs. groups of two students vs. individually).

The project should contain four components: a proposal, a demonstration, an implementation, and a report.

Proposal

Proposal due date: 2025-10-31

The proposal is a document that outlines the topic of your project. Effectively, the proposal should describe why the scope of the project is appropriate for this course. The course instructor will provide feedback on the proposal following submission. Students are encouraged to be as detailed as possible in the proposal. The more details provided in the proposal, the more detailed feedback you will receive.

The proposal should contain the following elements:

1. Background and objective(s) for the project.
2. Proposed method(s) from artificial intelligence.
3. Dataset or environment to be used.
4. Proposed validation/analysis strategy.
5. Description of the novelty of the project.
6. Schedule of milestones to be completed each week (beginning the week after the proposal is submitted).

Page limit for proposals: 2 pages maximum

Please use a standard page format (i.e. page size 8.5” x 11”, minimum ½” margins, minimum font size 10, no condensed fonts or spacing). Please submit the proposal as a PDF file.

Proposals are to be submitted electronically through Brightspace. It is your responsibility to ensure that your proposal is submitted properly. Students may submit the proposal earlier to receive earlier feedback on the proposal.

The proposal is worth 12% of the project grade.

Demonstration

Demonstration date: During the final week of class (to be arranged individually)

The project will be demonstrated to the instructor or teaching assistants during a live (in-person or online) demonstration session. The demonstration allows students to showcase the features of their implementation, demonstrate their implementation working on some examples, and allows the instructor or teaching assistants to ask questions about the project. Students must be prepared to run their implementation and answer technical questions about their implementation.

The demonstration should be targeted toward teaching assistants (i.e. students who have completed a course in artificial intelligence). The demonstration should not assume that teaching assistants are already familiar with the specifics of the problem addressed in of your project.

Time limit for demonstrations: 13 minutes maximum (~8 minutes for implementation + ~5 minutes for questions)

Demonstrations will be conducted during a live in-person or online meeting with the instructor or a teaching assistant. Specific timeslots will be assigned by the course instructor with consideration to availability/preferences indicated in the project information survey.

You will be responsible for ensuring that any technology related to your demonstration functions appropriately. Any excessive setup/takedown time will count towards your allocated demonstration time.

The demonstration is worth 20% of the project grade.

Implementation

Implementation due date: 2025-12-05

The implementation should contain a complete implementation of the methods. The implementation must be maintained using a repository on GitHub. The implementation must be readable, follow appropriate programming practices, and have sufficient documentation. Your commit history to the repository will be reviewed.

Your group must create a group repository within our Github classroom environment. Instructions to access the Github classroom and a repository for your project are provided in a separate document on Brightspace. To submit, simply ensure all your commits have been pushed to your repository within the Github classroom.

The implementation is worth 16% of the project grade.

Report

Report due date: 2024-12-05

The project report is a document that describes your project in detail. The report should be targeted toward the teaching assistants (i.e. students who have completed a course in artificial intelligence). The report should not assume that teaching assistants are already familiar with the specifics of the problem addressed in of your project.

The report should contain the following sections:

1. Front matter
    - Title of project
    - Course code
    - Names and student numbers of all group members
2. Statement of contributions (if project completed in a group)
    - Whether each group member made a significant contribution
    - Whether each group member made an approximately equal contribution

- To which aspects of the project each group member contributed

3. Introduction
   - Background, motivation, and objectives for the project
   - Related prior work
4. Methods
   - Methods from artificial intelligence used
   - Dataset or task environment
   - Validation strategy or experiments
5. Results
   - Qualitative results
   - Quantitative results
6. Discussion
   - Limitations of the work and directions for future work
   - Implications of the work
7. References
8. Link to your implementation in the Github classroom.

Page limit for reports: 10 pages maximum

Please use a standard page format (i.e. page size 8.5" x 11", minimum ½" margins, minimum font size 10, no condensed fonts or spacing). The page limit includes all figures, tables, appendices, and references. Please submit the report as a PDF file.

Reports are to be submitted electronically through Brightspace. It is your responsibility to ensure that your report is submitted properly.

The report is worth 52% of the project grade.