CSC514/CSC528: Artificial Intelligence

1. Introduction

Students enrolled in CSC528 are required to implement the AI concepts learnt in software. A written report on the project and a brief oral presentation summarizing the same is expected at the end of the semester.

This project is designed to test your knowledge of concepts taught, your creativity and attempts at finding solutions in some interesting AI problems with practical applications.

Those of you who are interested in pursuing research in AI or a topic that involves some AI are strongly encouraged to participate fully and see the Lecturer for a topic that *could* get you started on such research activity.

The results of the project should be written up in the form of a scholarly manuscript as described in the guidelines below. Please exercise great care to avoid **plagiarism**. Plagiarism is the deliberate use of someone else's language, ideas, data, code, or other original material that is not common knowledge without properly acknowledging the source.

You should also acquaint yourself with appropriate ways to acknowledge the contributions of others and to cite all your sources. Plagiarism is a serious offence that will be penalized.

2. Term Project

a. Each individual is expected to develop an AI graphical user interface (GUI) software using any programming language subject to approval from the course Lecturer.

b. The AI software should contain:

   i. **Uniformed Search Methods**: Write a program that contains the implementation of the following uninformed algorithm:

      1. *Depth-First Search (DFS)*
      2. *Depth-Limited Search (DLS)*
      3. *Iterative Deepening Search (IDS)*
      4. *Breath-First Search (BFS)*
      5. *Bidirectional Search (BIDI)*
      6. *Uniform-Cost Search (UCS)*

   In addition, develop a visualization module that shows the way each algorithm traverses an n node graph or tree, where n is the number of nodes in the graph or tree.

   ii. **Group Project**:

      1. Develop and implement the algorithm that is required to solve your problem. Discuss extensively the real-life application of this algorithm.

c. The software **should be submitted together with the project report on the 27th of August 2021**.

3. Instruction and Guidelines for Preparing The Project Report

a. Every individual is expected to prepare his project report as follows:

TITLE PAGE: This page should contain:

1. Title of the project
2. Matriculation number
3. Name of student
4. Course Code
5. Session

ABSTRACT: A brief description of the problem solved, motivation, methodology adopted and results obtained in not more than 250 words.

INTRODUCTION: A short general description of the area of AI your project. The problem you tried to solve, the methodology adopted, results from literature and the available tools.

LITERATURE REVIEW AND REAL LIFE APPLICATION: Do a literature search on all the algorithms you implemented and write a critical review on these algorithms highlighting their weaknesses and strengths. Provide examples of their real world applications.

ALGORITHM DESIGN: Describe the algorithms and the various designs available. Provide pseudo code for each algorithm.

SOFTWARE DESIGN: Provide detailed software design and architecture, input and output design, etc…

SOFTWARE IMPLEMENTATION: Provide detailed description of how the software was implemented. This will include the programming language used, the platform, etc…

RESULTS: Discuss the results obtained.

CONCLUSION: Conclude the report by deducing inferences from the result obtained and highlighting experiences gained from the term project.

APPENDICES: Sample codes, reports, results, inputs and outputs, etc.

Each report should be prepared using the following format:

1. Font type should be Times New Roman
2. Report title should be font size 22pt
3. Heading 1 font size should be 16pt
4. Heading2 font size should be 14pt
5. Body of text font size should be 12pt