COSC 370 – Artificial Intelligence
Project 3

Purpose: Use any or all of the AI techniques from this course to program an AI for a competition simulation.

Task: For this project you will be coding an AI to play the adversarial simulation created by MIT for their annual Battlecode competition. For this "game" you will need to develop an intelligent agent that handles both macro and micro decision-making in real-time. From the Battlecode website (battlecode.org):

"In Battlecode, two teams of virtual robots roam the screen managing resources and executing different offensive strategies against each other. Your AI player will need to strategically manage your robot army and control how your robots work together to defeat the enemy team."

For this project, we will be using the Battlecode 2018 competition. You will find the links required to install and run the Battlecode 2018 application on the course website. You should feel free to use any AI techniques that you wish, including ones we have not covered in this class.

Implementation: you may use any of the languages allowed by Battlecode's simulator to create your intelligent agent (Java, Python, C – we suggest Python). You should make sure you are testing your implementations by running them in the Battlecode 2018 simulation. As a note, a link for the GameController API is available on the course website (read through the document and find the GameController section). These are the functions that run your robots. It is embedded in the overall documentation file for the Python implementation, so if you are working in Java or C, you may need to make some small modifications and read through the source files for the Java implementation. I've also linked a YouTube playlist that may be helpful (especially if you are working in Python).

You should test your implementations not just against the example AI (which you should be able to beat relatively quickly), but also AIs from other teams!

Installation/Execution: Follow the installation instructions posted to the website for your OS using Docker. Please be sure to do this and test your installation by running a test game by Friday, March 8th. After you have downloaded and installed the appropriate Docker installation, make sure you download a copy of the bc18-scaffold repository, start the Docker command window, or a terminal, and then follow the instructions starting with "In the quickstart terminal".

Installation Warning: make sure that you remove any special characters from your Battlecode scaffold folder. If you don't, the application may not be able to see your bots!

Competition Tournament: On Wednesday, April 10 and Friday, April 12, we will be doing a round-robin tournament pairing teams in the simulator (will be using the default parameters). The results will not directly affect your grade for this project, but success in the tournament is an indicator of a good solution and implementation.

You are required to work in teams of 4 for this project, assigned during class on March 6th. Please designate one person as your "team leader," this is the point person that will be handling any communication with me and other teams. They will also be the one responsible for setting up and providing your AI for the competition tournament as noted above. Please also provide a team name. Team names with point person information will be posted in order to facilitate scrimmages.

You will also be asked to provide a numeric grade for each of your teammates. If the numeric grade is less than 80, please provide rationale for your grade assessment. This joint assessment will be 30% of each student's grade and will be kept confidential.

Github Use: Github is required for storing and updating your code. Each member must do their own pull requests (you are not allowed to have a central person handling all changes). This is done for two reasons: to make sure everyone gets experience using a source control mechanism and to make sure that everyone is contributing equally. We will be dedicating a class to the ins and outs of github and git.

Resources: Various links will be posted to the course page that will be useful to your AI development. Included in that will be the tutorials needed to get a very basic AI up and running.

Learning Targets: direct application of AI techniques.

DUE: April 8th, 11:59pm via Blackboard. Team evaluations due April 10th by noon via email.

Individual Rubric:

30% - team evaluations
70% - AI implementation

Deductions:
-10 team evaluations not in correct format/turned in on time
-25 lack of github activity
-15 lack of comments in the code
-100 AI implementation not able to be tested in battlecode