AI Programming (IT-3105) Project # 3:
Comparing AlphaGo and DeepStack

Due date: 12:00 (noon) on Thursday, May 4, 2023 (video uploaded to BLACKBOARD)

Purpose:

• Reflect upon your work on the first project
• Learn about the work done by students who chose the other first-project option.
• Gain experience producing a short, educational video with significant technical content.

This is strictly a group project, with groups of size 2 to 4. No solo work will be accepted.

1 Assignment Overview

Your group will produce one 5-minute video that compares (i.e., shows the most important similarities and differences between) the AlphaGo and DeepStack systems. The goal is to convey as much important technical information as possible in the most understandable manner, and all in 5 minutes or less. Two key themes in the comparison should be reinforcement learning and deep learning, and how each is embodied by both systems. You are expected to find other themes as well.

Ideally, some members of your group will have implemented the AlphaGo knockoff project, while others will have chosen the DeepStack knockoff, thus insuring that the group as a whole has deep insights into both systems and can thus make salient comparisons of interest to AI students and researchers, not just to go and poker players.

Read this document very carefully to avoid any costly misunderstandings or mistakes.

2 Diagrams

It is strongly recommended that the majority of your visual material is in pictoral form. Images often convey more useful information, more efficiently, than text; and this becomes very important with the 5-minute time restriction. You may decide to draw these images freehand on an online whiteboard, or you may choose more conventional diagramming tools, or a combination. Any of these approaches can serve your
purpose. Many educational blogs and vlogs get excellent results using freehand whiteboard sessions with a few accompanying PDF diagrams.

It is explicitly **forbidden** to use diagrams that are not your own in your video. Violation of this rule will incur a score of ZERO for the project. Copying of images is a matter that is taken very seriously in the media – in many cases it cannot be done without formal permission from the original source. In this project, part of your challenge is to produce diagrams that deliver your own message in the clearest and simplest form.

### 3 Animations

Simple, abstract animations are often excellent tools for explaining complex concepts, so you should definitely consider using them. To generate animations in matplotlib, you might want to use `FuncAnimation`, as nicely described in this blog post by Ken Hughes:

https://brushingupscience.com/2016/06/21/matplotlib-animations-the-easy-way/

Of course, there are many other free animation tools available online.

### 4 Humans in the Loop

It is **not** important that every group member speaks in the video. Too many voices could easily detract from the message. So think carefully about how many to use. We assume that all group members make significant contributions to the project. They don’t all have to appear in prime time.

Video of the speaker’s face or that of other group members should be limited or completely avoided. The 5-minute time restriction entails that anything shown on the screen should be providing important information; a *talking head* might be the best way to convey certain types of information, but most of the required content is quite technical and probably best transmitted via diagrams, equations and short animations (e.g. of flying poker cards or filling HEX boards).

### 5 Movie Contents

**Your movie must not exceed 5 minutes in duration. Violations of this constraint will incur the loss of one, maybe two points.** A key challenge of this project is to concisely and accurately present your case, and not to ramble on and on (as your instructor often does during lectures).

Your movie must include the following:

1. A brief overview of both AlphaGo and DeepStack, either their published versions or the knockoffs that your group members implemented.
2. A brief listing and explanation of the criteria upon which the comparison is based.

3. The comparison itself.

4. A brief argument for why one of these projects is a better assignment for an AI class than the other. You must make a choice here, even if it’s nearly a tie.

5. A credits page listing the full names of all team members and a few buzzwords about their main contributions. This page should not be on the screen for more than a few seconds, but we need it for doing our own credit assignment to all members of your team. Everyone will get the same number of points.

6 Deliverables

The movie will be worth two points (of the 6 total points available for this class). If all of the items listed under Movie Contents are covered with reasonable quality, your group should get both points. However, failure to cover any items, extreme sloppiness, or a duration over 5 minutes can easily cost a point (or two).

There is no written report, nor demonstration for this project. Simply upload a ZIPPED version of your movie to BLACKBOARD by NOON on the delivery date. In the text associated with your file, include the names of every group member. Only ONE group member should upload the video.