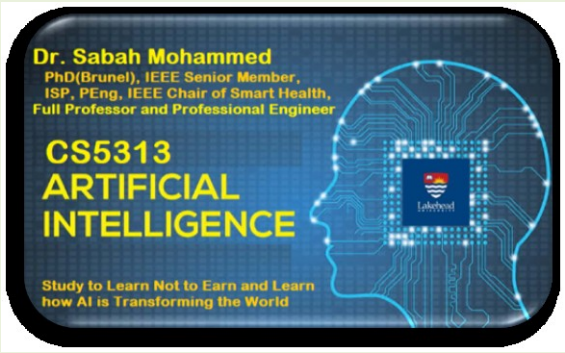
# COMP5313 Artificial Intelligence

## Department of Computer Science




# Project 1: Experimenting with FinTech using the AI-Gym RL Trading Algorithms

You will be using the AI-Gym environment provided by OpenAI to enforce several learning and control algorithms. AI Gym is a toolkit that exposes a series of high-level function calls to common environment simulations used to benchmark RL algorithms. You are asked in this Project to investigate at least two trading algorithms for a given data collected about the stocks of a given company. In this direction, you will need to do the followings:

1. Collect CSV Stocks Data for a Company of Your Choice:
   You can retrieve historical stock quotes from yahoo.com. Choose your company by its ticker symbol (e.g. Microsoft is MSFT):
   https://finance.yahoo.com/quote/MSFT/history/
   Then copy the data into Excel and save it as CSV:

| Date | Open | High | Low | Close* |
|---|---|---|---|---|
| 5/28/2019 | 126.98 | 128.00 | 126.73 | 127.04 |
| 5/24/2019 | 126.91 | 127.42 | 125.97 | 126.24 |
| 5/23/2019 | 126.20 | 126.29 | 124.74 | 126.18 |
| 5/22/2019 | 126.62 | 128.24 | 126.52 | 127.67 |
| 5/21/2019 | 127.43 | 127.53 | 126.58 | 126.90 |
| 5/20/2019 | 126.52 | 127.59 | 125.76 | 126.22 |
| 5/17/2019 | 128.31 | 130.46 | 127.92 | 128.07 |

2. Set your Trading Gym environment. You may use information from this tutorial article to set the environment according to a unified interface:
   https://towardsdatascience.com/creating-a-custom-openai-gym-environment-for-stock-trading-be532be3910e
   https://github.com/notadamking/Stock-Trading-Environment
3. Design two trading algorithms (agents) that have the ability to monitor the stocks through the observation_space for the last number of days (e.g. five days) to make a trading decision. You may add other factors in the agent decision beside the attributes of open price, high, low, close, and daily volume. The trading agent should have the ability to take number of action types (buy, sell, and hold).
4. Test your agents' abilities to make profit and compare them.
5. Visualize your stocks environment(s) using Matplotlib. For this you may use information from this tutorial article:

https://towardsdatascience.com/visualizing-stock-trading-agents-using-matplotlib-and-gym-584c992bc6d4
https://github.com/notadamking/Stock-Trading-Visualization

**Submission Details:**

1. One ZIP file (Other compression types like RAR are **NOT** Acceptable) containing the source file (YourName_RL.py) + **ReadMe.pdf** (MS Word is **NOT** acceptable) describing the idea of your program + Screen Shot of the outputs + the Jupyter File (IPYNB).
2. Submit to D2L only before due date (**One hr delay take 1 Mark up to three hours**).
3. It must be your individual work.
4. Double submissions are **not** allowed.

**Important Note: Respecting the student behaviour code is highly appreciated and any submission found with high similarity with other students solutions or from solutions over the Internet will be rejected.**
https://www.lakeheadu.ca/faculty-and-staff/policies/student-related/code-of-student-behaviour-and-disciplinary-procedures