

CSCI1410 Fall 2022

## Final Project: The Game of Thrones - Final Capstone Writeup

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### **1 Overview**

For my capstone project, I was tasked with creating ML bot for the Game of Thrones game created by CS1410's staff. This bot utilizes supervised, transfer, and DQNs.

### **2 Abstract**

I aimed to create a bot that used various Machine Learning techniques to tackle the GoT ASP. There were various reasonable methods that could be used like supervised learning using perceptrons and reinforcement learning. However, I ended up using a combination of supervised learning using a neural network, transfer learning, and then DQNs to improve performance. In summary, I used a CNN to train game states to the resulting moves of a particular bot against all other bots, saved the model's weights, created a DQN, and further ran simulations to improve on the original weights. The purpose behind the supervised and transfer learning is to have a good set of weights that can play the game instead of using the DQN beginning with random actions. This ideally should lead to quicker and more accurate results.