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VikingBot: The StarCraft Artificial Intelligence

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VikingBot: The Starcraft Artificial Intelligence

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Motivation

- VikingBot is an Automated AI that plays StarCraft Brood War with the goal of beating human players
- Current competitive StarCraft AI uses a lot of computing resources like Google's Alphastar
- There's a student StarCraft AI Tournament every year

StarCraft Brood War

- StarCraft is a Real Time Strategy game that focuses around resource collection, base expansion, military expansion, and conquering opponents
- Brood War is an expansion pack for StarCraft which adds various new aspects to the original game and provides new ways for users to play



Brood War API

- The Brood War API interfaces with StarCraft, providing functions to control units, manage resources, and acquire information
- To simulate realistic player vision it does not provide information on anything inside of the Fog of War

State of the Project



Figure 1. Training Scenario for Melee Combat Model



Figure 2. Planned Attack by AI Planner. (VikingBot is the Purple Protoss)

- Only able to play Protoss
- Creates a strong early economy and army
- After producing enough Zealots VikingBot will go on the offensive and push the other players base
- Training for the Combat Manager is able to be done in specific conditions that we can control
- Planner utilizes a specialized reward function to evaluate which action(s) should be taken to win
- VikingBot is able to hand off unit control from the AI planner to the Combat Manager

Our System

- Planner
 - Controls and plans what the bot should do using BURLAP, an AI planning library
- Combat Manager
 - Controls the army through SARSA reinforcement learning
- Intelligence Agent
 - Collects all relevant information regarding the state of the game
- Strategy Agent
 - Creates high level goals for the other agents to execute such as building, training, and attacking
- Economy Agent
 - Manages resource gathering, base expansion, and military expansion

Future Work

- Improvement of planner action selection function to allow for more complicated strategies
- Manipulation of Planner to execute slower strategies and not only Zealot rush
- Letting the bot play Zerg too

Challenges

- Finding a balance between the Combat Managers state space size and the complexity of possible actions
- Learning how to use the BURLAP library to implement our own environment, model, and planner