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## VikingBot: The StarCraft Artificial Intelligence

Tyler Barger

*Western Washinton University*

Daniel Peterson

*Western Washinton University*

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# VikingBot: The Starcraft Artificial Intelligence

Tyler Barger, Matthew Carter, Chris Lokken, Daniel Peterson  
Advisor: Dr. Wesley Deneke



## 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