

STAR CRAFT™

Broodwar Agent



What's Starcraft Broodwar?

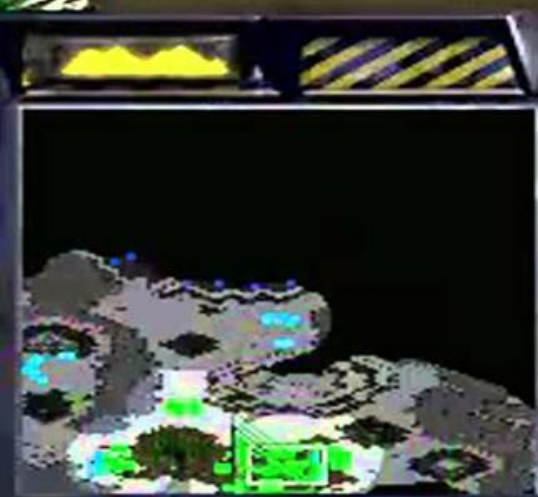
- **Just an (extra)ordinary Real Time Strategy game.**
- **Build a base, expand, build an army, eliminate your opponents!**



228

739

89/116



1500/1500

Terran Command Center

Supplies Used: 89
Supplies Provided: 10
Total Supplies: 116
Supplies Max: 200

MENU



3 different classes

- Terran
- Protoss
- Zerg







So how do you control the game?

- **BWAPI – A very impressive and well documented API**
- **Able to control every aspect of the game**
- **Tournaments exist for Starcraft bots that were written with BWAPI.**

Setting our goals

- **The API gave us endless possibilities.**
- **We had to be modest about the goals that we set ourselves due to time limitation.**

We've decided about the following goals

- **Resource collection**
- **Searching unknown places in the map**
- **Finding new resource fields in the map**
- **Expansion – build a new base near all found resource fields**

What we don't do

- **We don't build an army**
- **We don't engage the enemies at all, in fact we just politely ignore their existence.**

You might think that's not very promising in terms of survival chances.

- You're right.
- In fact we cannot ever reach our goal of full expansion because the enemy destroys us before that.
- Thus another fun and desirable aspect for our bot is long survival time

Our approach

- A^*
- Custom weight heuristic
- Custom states & actions

The game is online

- We run A^* on each frame of the game
- We expand the tree to depth 2 and take the best action per frame.
- We are greedy.

Our states

- # bases
- # builders
- # searchers
- # miners

Our actions

- **Search the map (8 walking actions)**
- **Collect minerals**
- **Build base**
- **Create worker**

Our goal state

- **Control all mineral fields in the map.**
- **It's never reached since we die before that.**

Our heuristic

- **States prioritized through weights (high to low):**
 - **Build base**
 - **Create worker**
 - **Collect minerals**
 - **Search the map**
- **We keep a balanced ratio of worker types**

A small demonstration

Results

- **Plays well on a variety of maps.**
- **Any number of enemies in a map.**
- **We've successfully reached all our goals.**
- **We never reach perfect expansion because we die.**