

# Team 17: eXtreme Coding Starcraft

## Design of the XCS-based Starcraft Bot

Manuel Milling, Tobias Petzak, Severin Wunsch

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Faculty of Applied Computer Science, University of Augsburg

Overview

State Space

Actions

Rewards

# Overview

- ▶ Multi-Step Reward
- ▶ Different XCS for each type of unit (shared between units of same type).
- ▶ start simple → upgrade gradually.

# State Space

- ▶ Absolute Position of operating unit
- ▶ Relative Positions of  $k/l$  many closest Enemies/Allies including their health, type, status etc.
  - ▶ Use Polar Coordinates
  - ▶ Sectors can overlap
- ▶ Total Number of Allies and Enemies in Sight.
- ▶ Total Killcount

# Actions

- ▶ Pause
- ▶ Move in Direction (8?)
- ▶ Move to closest Enemy/Allie (of type...)
- ▶ Shoot at Enemy of type X with lowest health/ closest position
- ▶ Use special abilities

## Rewards (positive)

- ▶ Category 1
  - ▶ Move to possible direction
- ▶ Category 2
  - ▶ Find Enemy Unit
- ▶ Category 3
  - ▶ Deal Damage to Enemy Unit (Reward proportional to Damage)
  - ▶ Heal Allied Unit (Reward proportional to Healing)
- ▶ Category 4
  - ▶ Kill Enemy Unit
- ▶ Category 5
  - ▶ Win Game

## Rewards (negative)

- ▶ Category 1
  - ▶ Go to unreachable Point (Water, Edge of the Map)
  - ▶ Lose Mana (Reward proportional to Mana Loss)
- ▶ Category 2
  - ▶ Get Detected by Enemy Unit
- ▶ Category 3
  - ▶ Get Damage (Reward proportional to Damage Dealt)
  - ▶ Not able to use Special Ability (Mana)
- ▶ Category 4
  - ▶ Get Killed
- ▶ Category 5
  - ▶ Lose Game