Artificial Intelligence for Battle Robots

Jeroen Rooijmans, Maarten Inja and Maarten de Waard

UvA

June 3, 2010

- Introduction
- Method
- Planning

Introduction and tasks

Our goal: Make an Artificial Intelligence for Robocode. What are we going to focus on?

- What is powerful behavior for a single bot?
- Can powerful behavior be generated using genetic programming?
- Can we build bots that can compete against strong enemies?
- What is powerful behavior for a team of bots?
- Can powerful team behavior be generated using genetic programming?
- Can we build teams that can compete against strong enemy teams?
- Can a generic algorithm do this?

Why is this interesting?

- AI in a game
- Getting optimal results
- Generic algorithms

Method

Three main subprojects:

- Single bots
- Team bots
- Generic algorithms

Single bots

- Come up with strategies
- Find strategies on the internet
- Test performance
- Use RoboResearch

Team Bots

- Research what kind of behavior is powerful
- Create the powerful behavior

Found results: Powerful bots with simple behaviour works okay.
Several improvement possibilities:

- Military tactics
- Related game AI's
- Nature

Generic Algorithms

- Robocode JGAP environment
- Meta-language
- Convert “genotype” to “phenotype”
- Generate “genotype”
- Watch “phenotype”

General tasks

- Creating the metalanguage: Rooijmans & de Waard
- Report responsibility: Rooijmans
- Presentation responsibility: de Waard
- Keep code "clean": Inja
- Benchmarking robots: Inja
- Finding enemy bots: Rooijmans

Single bots

- Research ("what is a good bot?"): Rooijmans
- Math: de Waard
- Optimizing astrobot: Rooijmans

Robot teams

- Basic team tactics: Inja
- Advanced team tactics: de Waard
- “Leader“ AI: de Waard
- “Droid” AI: Inja

Genetics

- Research: Rooijmans
- Single bots: Rooijmans & Inja
- Teams: Rooijmans & de Waard

WBS	Name	Work
1	**Initiation**	**7d**
1.1	Make planning and websites	1d
1.2	Read articles about generic algorithms	2d
1.3	Make Workplan	1d
1.4	Make first bots	3d
1.5	Present workplan	N/A
2	Make halfway report	5d
3	Make halfway presentation	5d
4	Halfway presentation and report	N/A
5	**Bot phase**	**12d**
5.1	Make model for generic and ordinary bots	3d
5.2	Make good bots	2d
5.3	Make generic code for bots	3d
5.4	Benchmark good bots	1d
5.5	benchmark and test generic bots	3d
6	**Team phase**	**7d**
6.1	Make good teams	2d
6.2	Benchmark good teams	1d
6.3	Make generic code for teams	3d
6.4	benchmark generic teams	1d
7	**Rounding off**	**9d**
7.1	Presentation	N/A
7.2	Final Report	N/A
7.3	Make presentation	4d
7.4	Make Final report	5d