GENETIC PROGRAMMING OF AUTONOMOUS AGENTS

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Advisors
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OUTLINE

• Review of Genetic Programming (GP)
• Original Goals
• Overview of System
• Progress
• Future
• Schedule
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REVIEW OF GP

Simulation of Evolution
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ORIGINAL GOALS

• GP Framework
• Create Simulator
• Evolve Autonomous Agents
• Perimeter Maintenance
• Noisy Environment
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SYSTEM
Largely Unchanged
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Guard Evolution in the Grid Domain
REWRITE OF GP FRAMEWORK

Solution

- Heterogenous Team
- Coevolution of Enemies

Feature

- Allowed Multiple Populations
- Support for Arbitrary Objects in Genome (Continuous)
HETEROGENEOUS TEAMS
CO-EVOLUTION OF ENEMIES
HETEROGENEOUS CO-EVOLUTION
WHAT I’VE LEARNED

• GP Cheats

• Asymmetries of Grid Domain Have Dramatic Effect

• Fitness Function
  • Modify to Prefer Certain Solution
  • Too Much, Lose Creative Solutions
PROGRESS
Continuous Simulator

Thursday, March 3, 2011
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FUTURE WORK

- Homogenous Teams - Continuous
- Heterogenous Teams - Continuous
- Co-evolution - Continuous
- Add Noise to Simulator
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| March 3     | Interface GP framework and Cont. Simulator |
| March 10    | Evolve homogenous team with “dumb” enemies |
| March 17    | Evolve homogenous team and enemies          |
| March 24    | Evolve heterogenous team and enemies        |
| March 31    | Research/perform additional tests           |
| April 7     | Additional tests and deliverables           |
| April 14    | Additional tests and deliverables           |
| April 21    | Additional tests and deliverables           |
| April 28    | Additional tests and deliverables           |
QUESTIONS?