GENETIC PROGRAMMING OF AUTONOMOUS AGENTS

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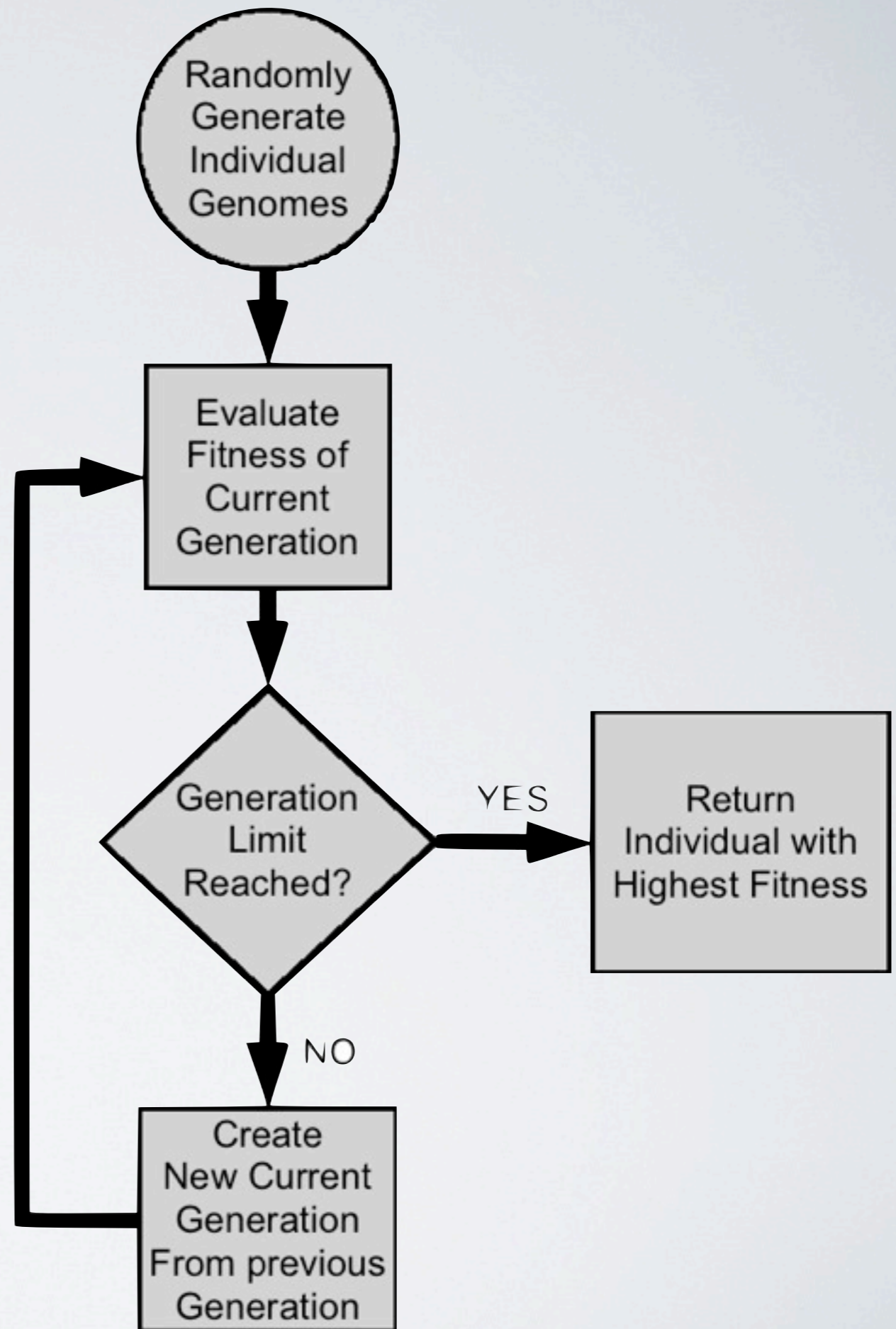
Thursday, March 3, 2011

OUTLINE

- Review of Genetic Programming (GP)

- Original Goals

- Overview of System

- Progress

- Future

- Schedule

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REVIEW OF GP

Simulation of Evolution

Randomly Generate Individual Genomes

Evaluate Fitness of Current Generation

Generation Limit Reached?

YES → Return Individual with Highest Fitness

NO → Create New Current Generation From previous Generation
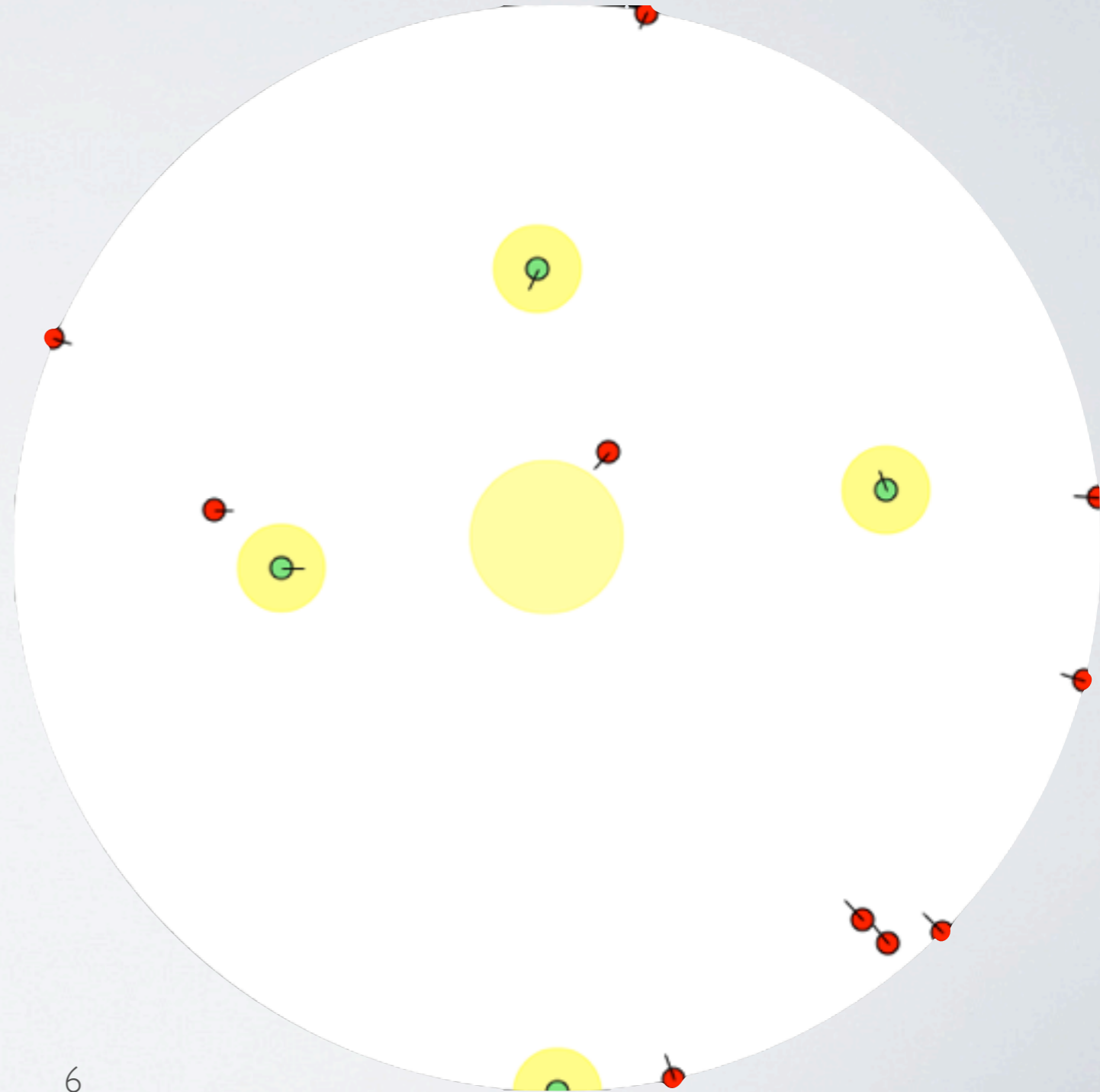
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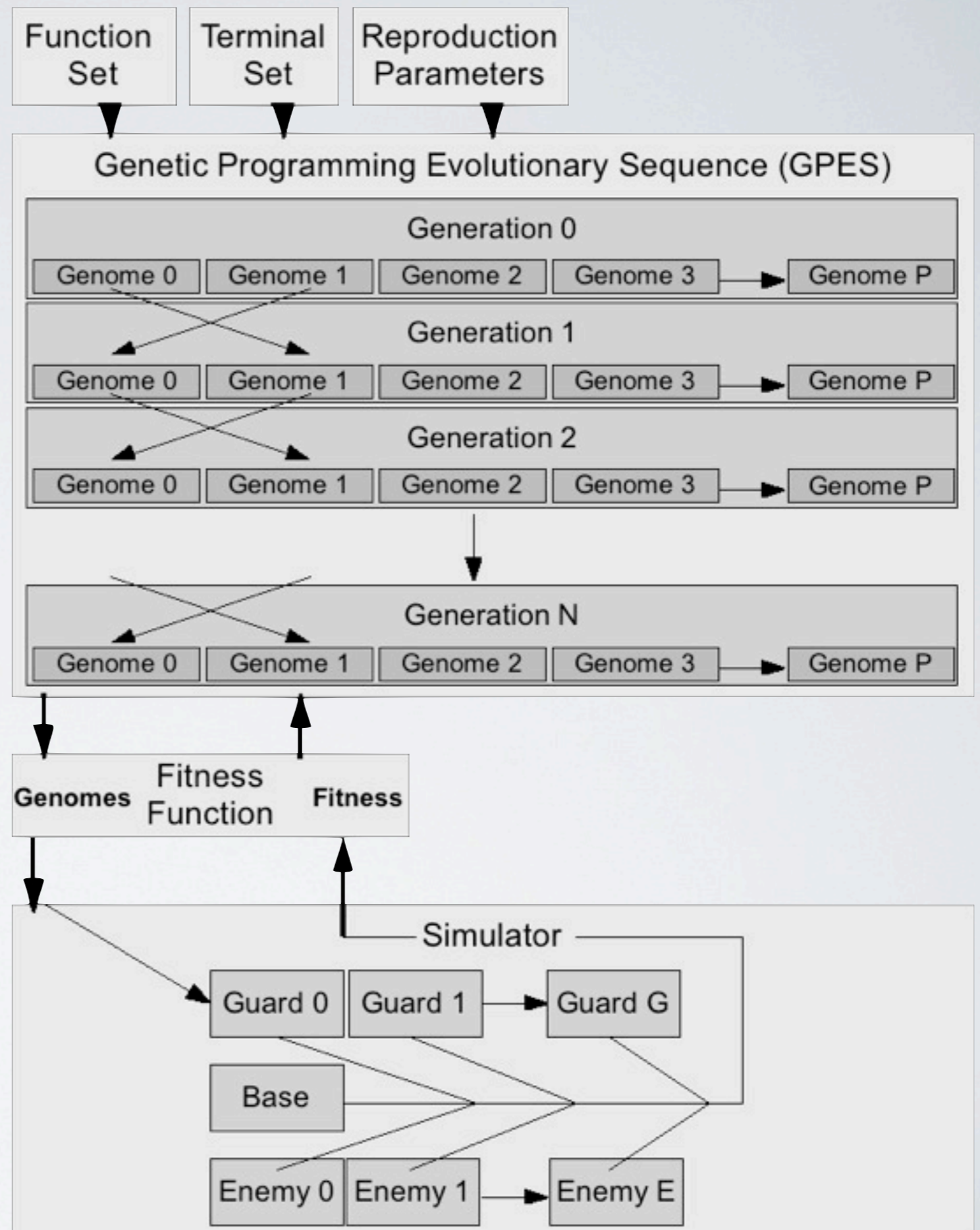
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ORIGINAL GOALS

- GP Framework

- Create Simulator

- Evolve Autonomous Agents
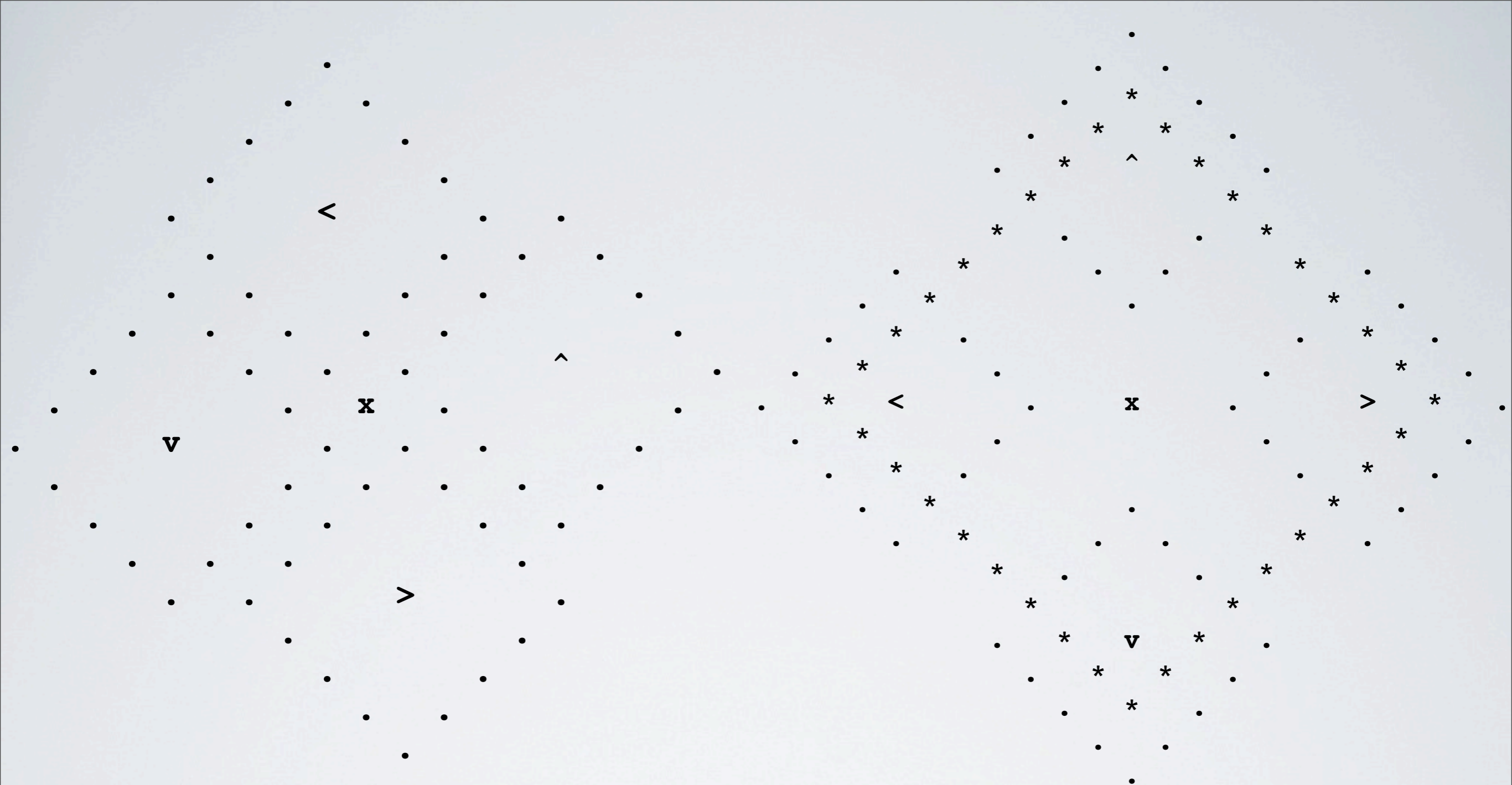
- Perimeter Maintenance

- Noisy Environment

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SYSTEM
Largely Unchanged

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PROGRESS
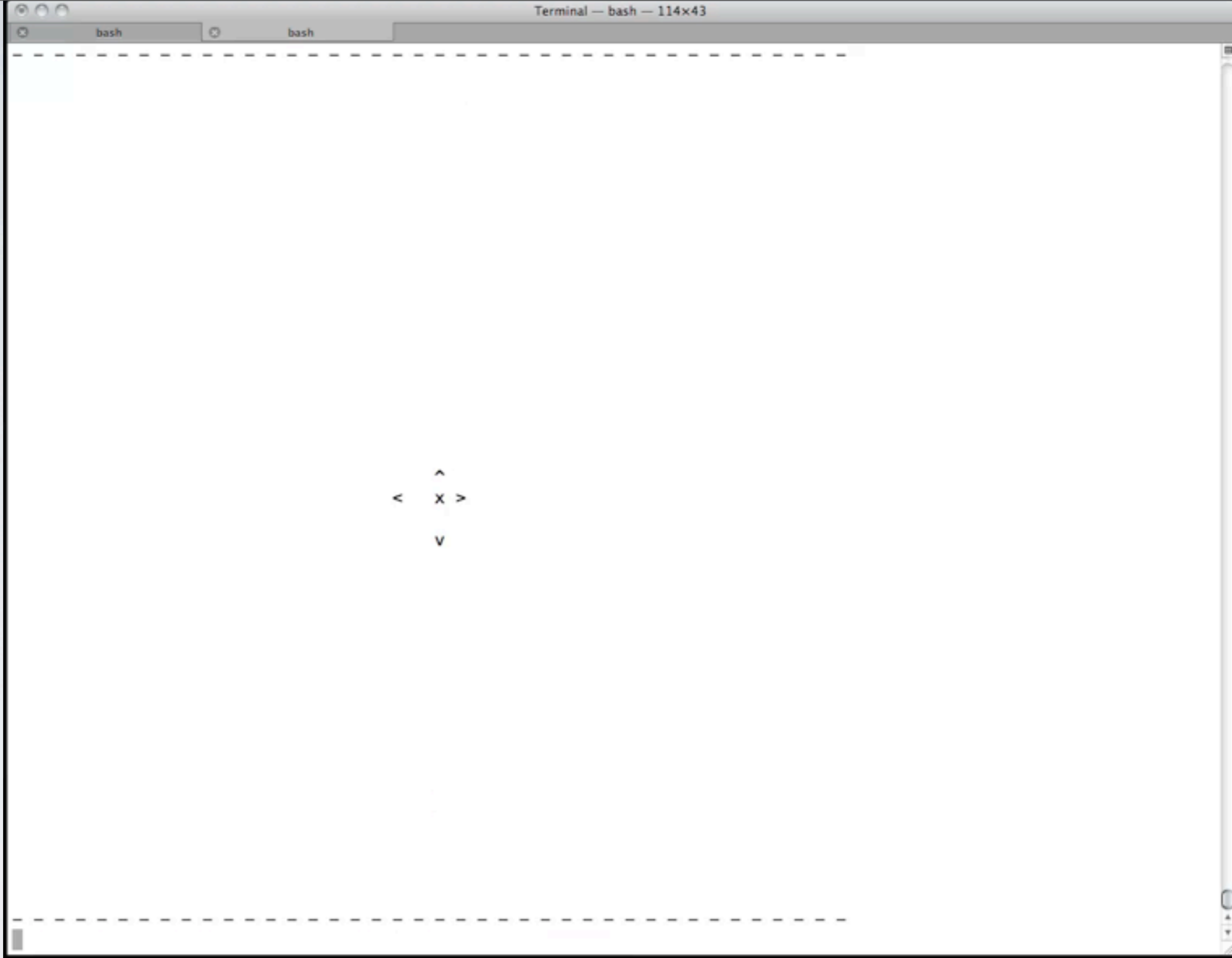Guard Evolution in the Grid Domain
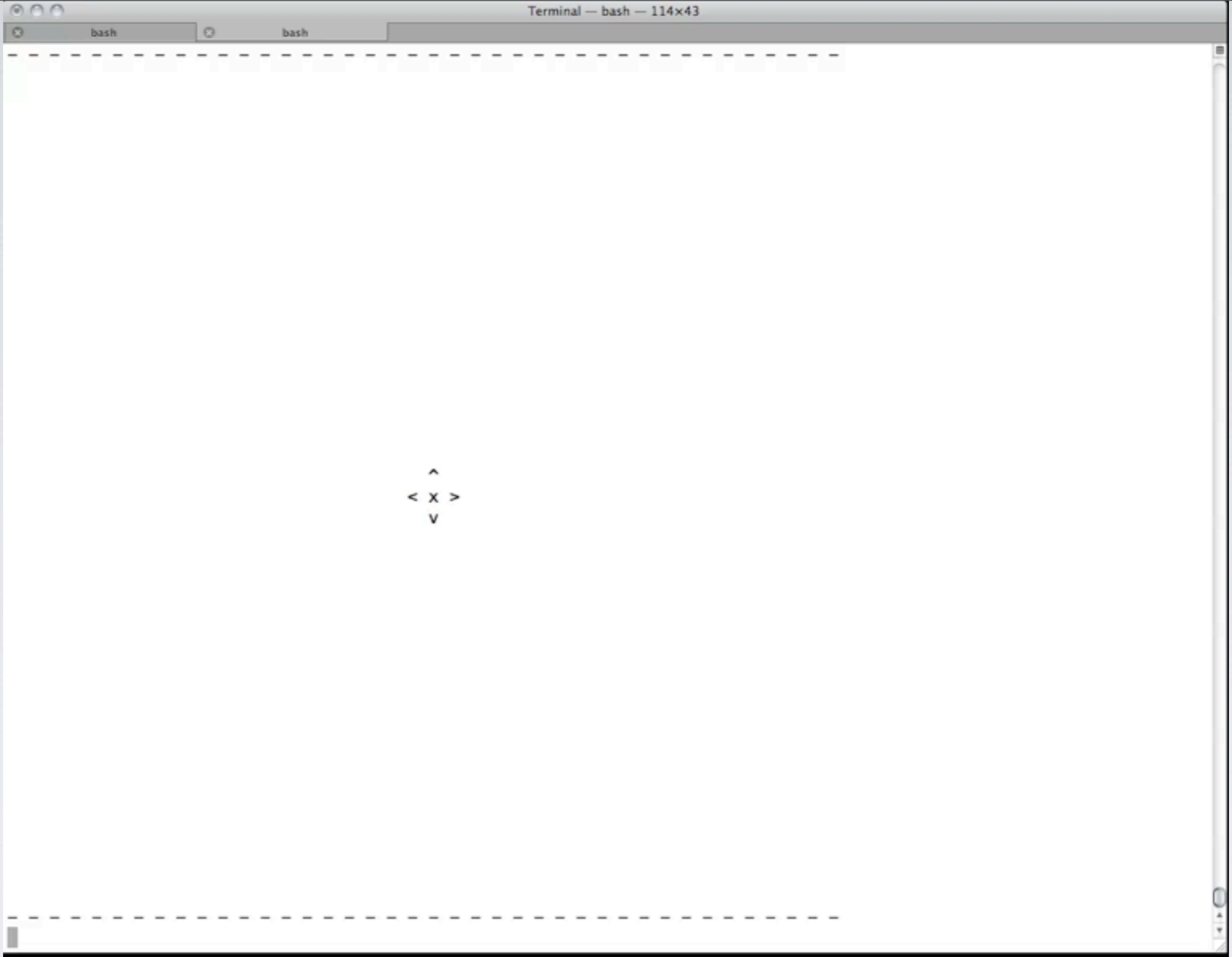
REWRITE OF GP FRAMEWORK

Solution

- Heterogenous Team
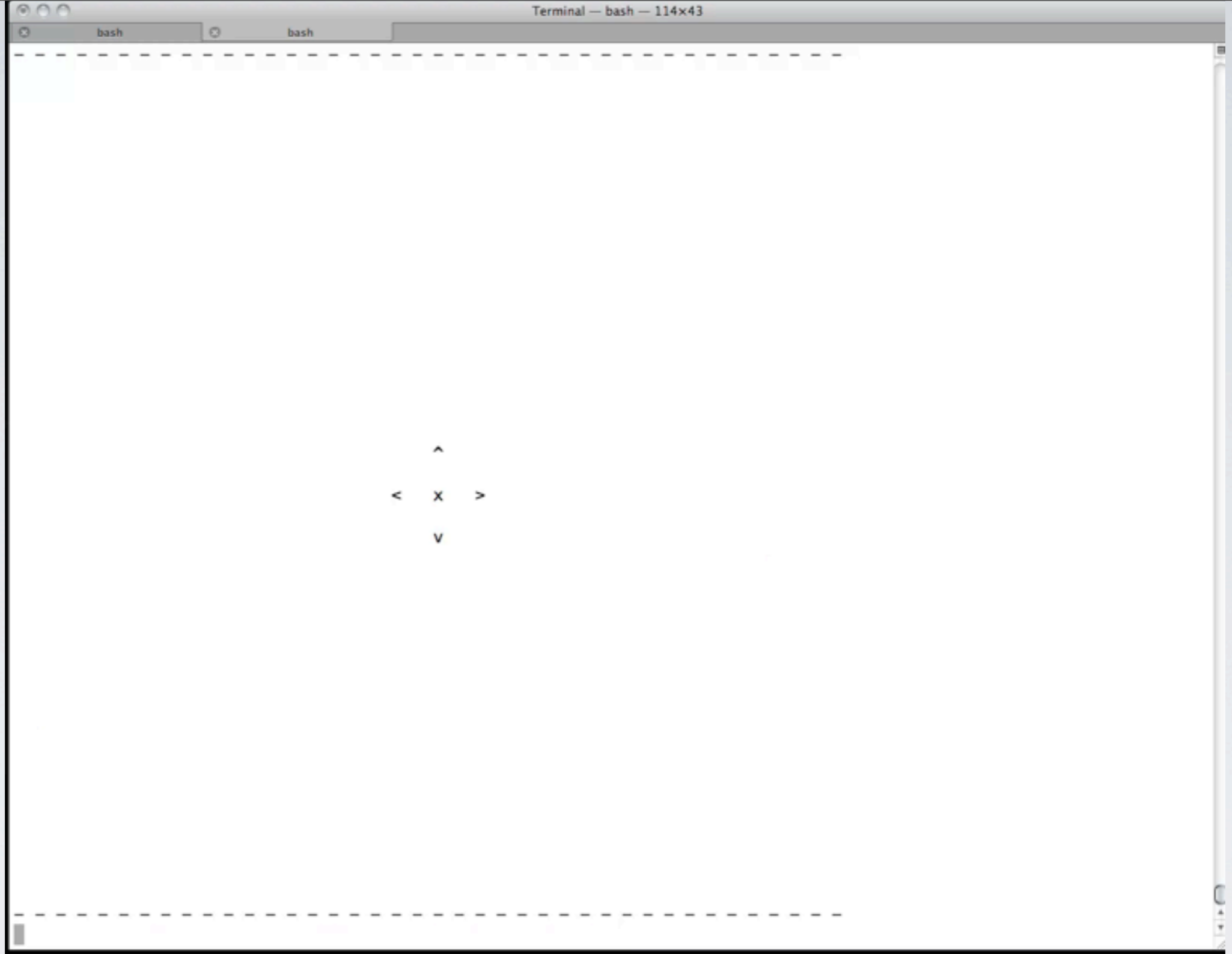
- Coevolution of Enemies

Feature

- Allowed Multiple Populations

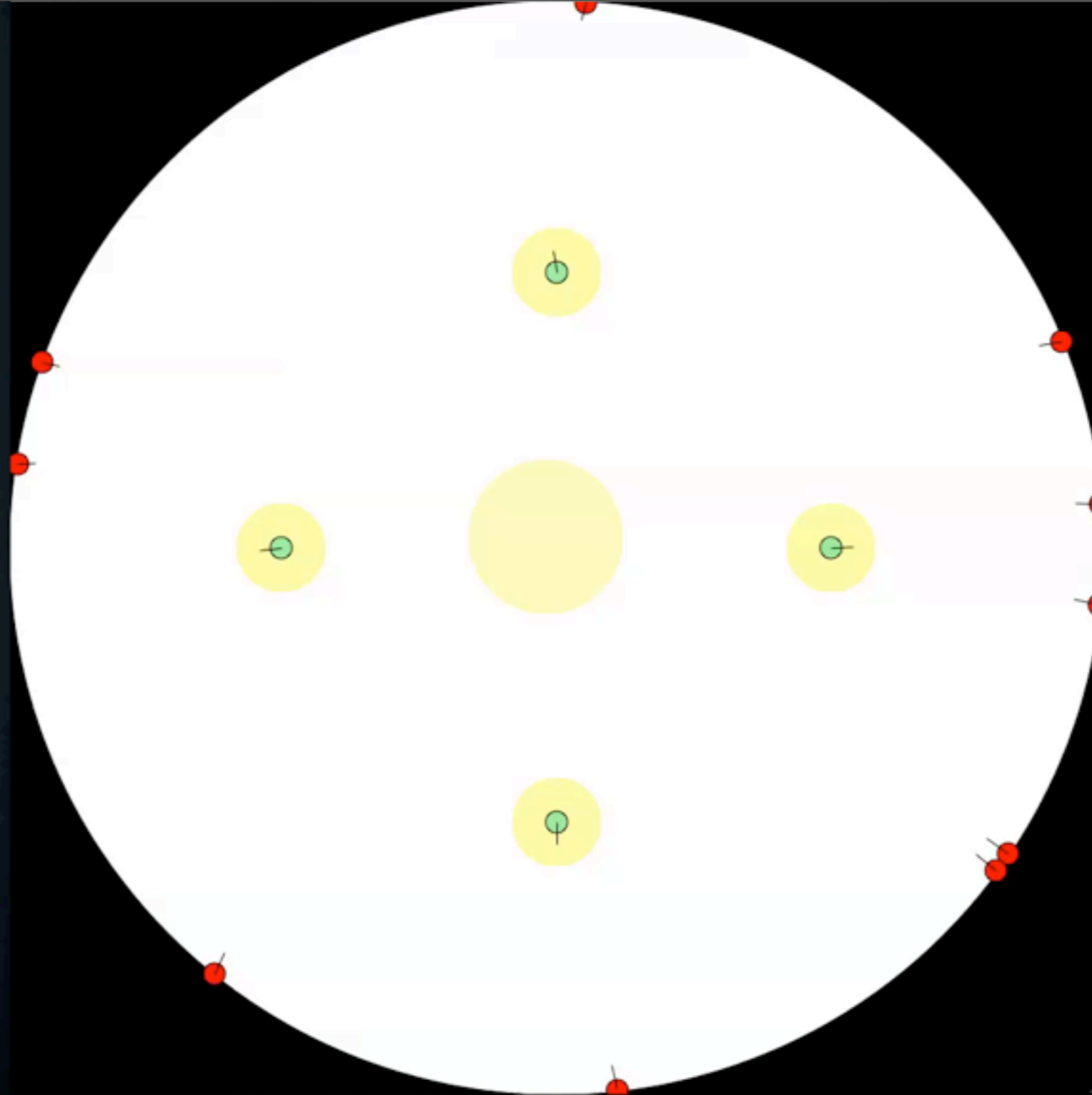- Support for Arbitrary Objects in Genome (Continuous)

HETEROGENOUS TEAMS

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CO-EVOLUTION OF ENEMIES

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HETEROGENOUS CO-EVOLUTION

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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

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PROGRESS
Continuous Simulator

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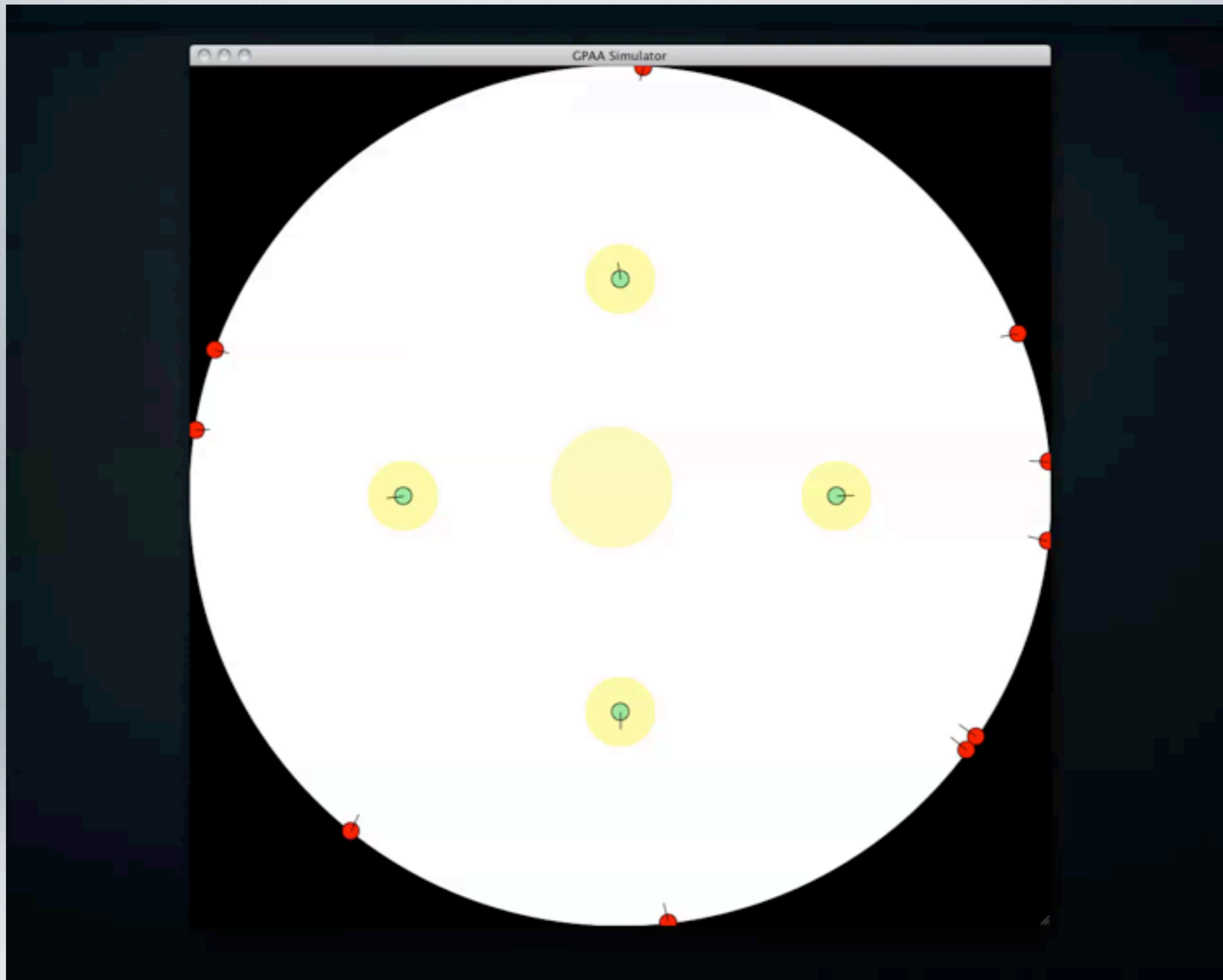
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FUTURE WORK

- 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

SCHEDULE

QUESTIONS?

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