

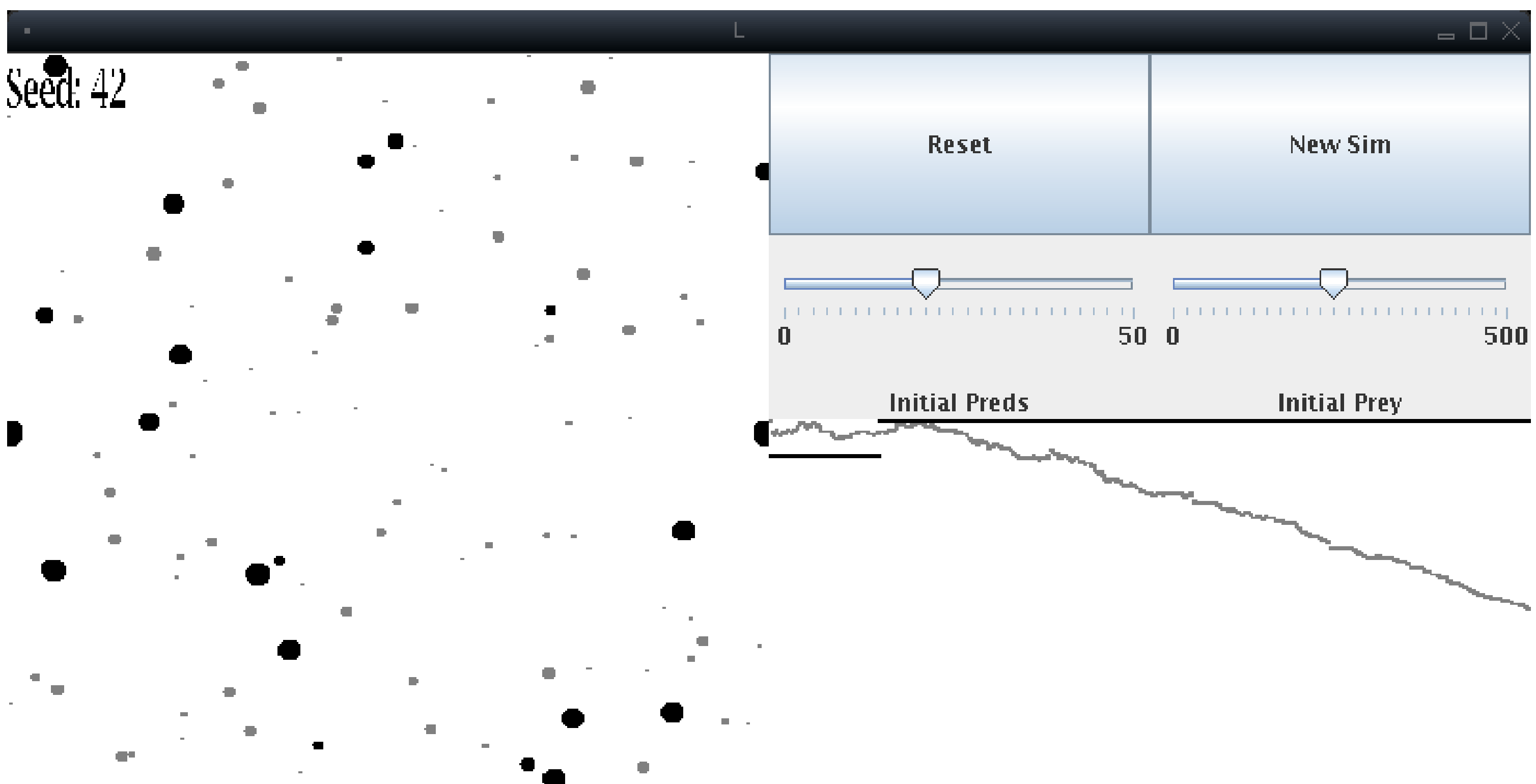
Artificial Intelligence in a Multi-Agent Model

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Abstract

Agent-based modeling is an extremely diverse field of research, and much analysis and research into the effectiveness of agent-based modeling. Agent-based modeling is valued for its ability to model scenarios in a level of detail that would be prohibitively complicated in an equation based model. I will investigate the possible value of detailing agent behavior beyond simple rules, to the level of basic artificial intelligence for each agent.

Screenshot of the simulation run with a random seed



Goal

The goal is to yield a deeper understanding of multi-agent modeling. A modeling of a simple predator-prey interaction with implementation of advanced decision-making mechanisms for agents should yield different results depending on the level of intelligence each agent has. Clearly, implementing a scenario that investigates all artificial intelligence in agent-based modeling is beyond the scope of the resources available. As a result, this project will attempt to analyze the results of implementing varying levels of artificial intelligence for agents in a simple simulation between predator and prey. Multiple cases of the scenario will be set up, and the rules for each agent will be varied between cases. The cases will be compared to yield results concerning the effect of the artificial intelligence.

Results

So far, because of the limited success in getting an accurate representation of an equation-based model, there are few results to speak of. However, I can graph the results of a complete run of the program:

