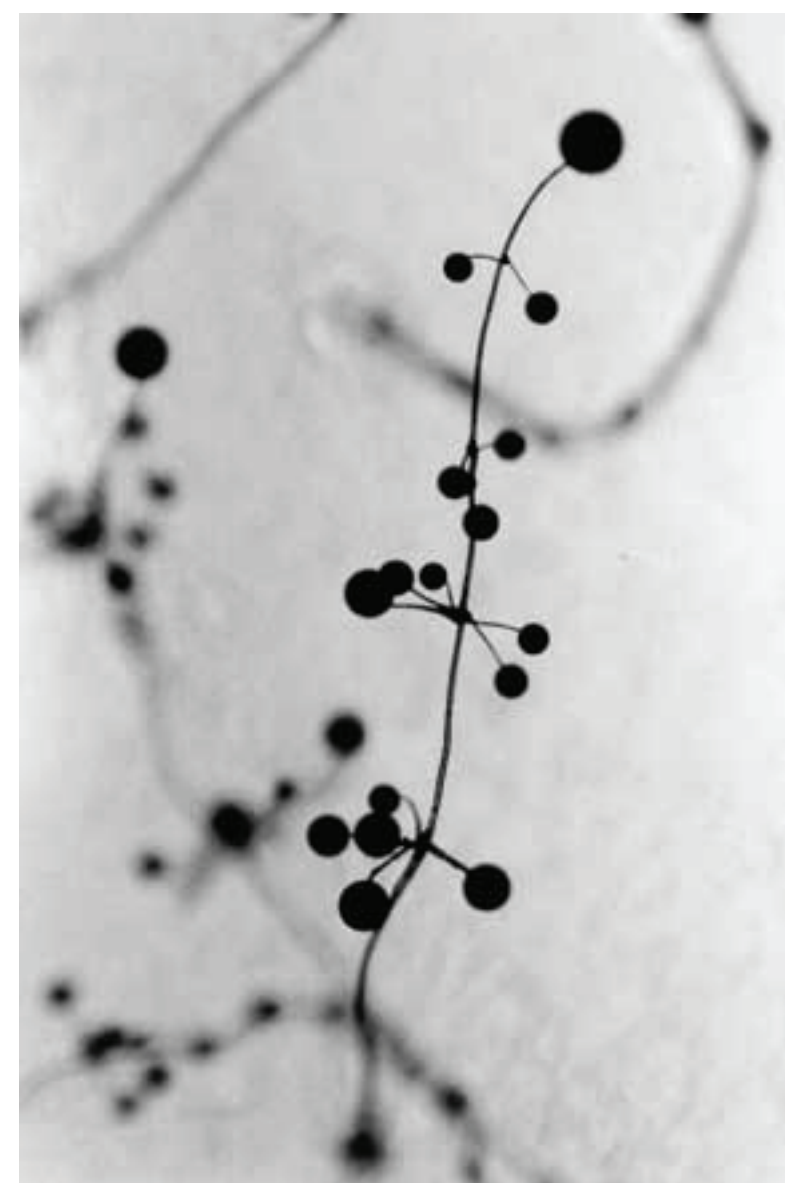


Exploring Emergent Systems



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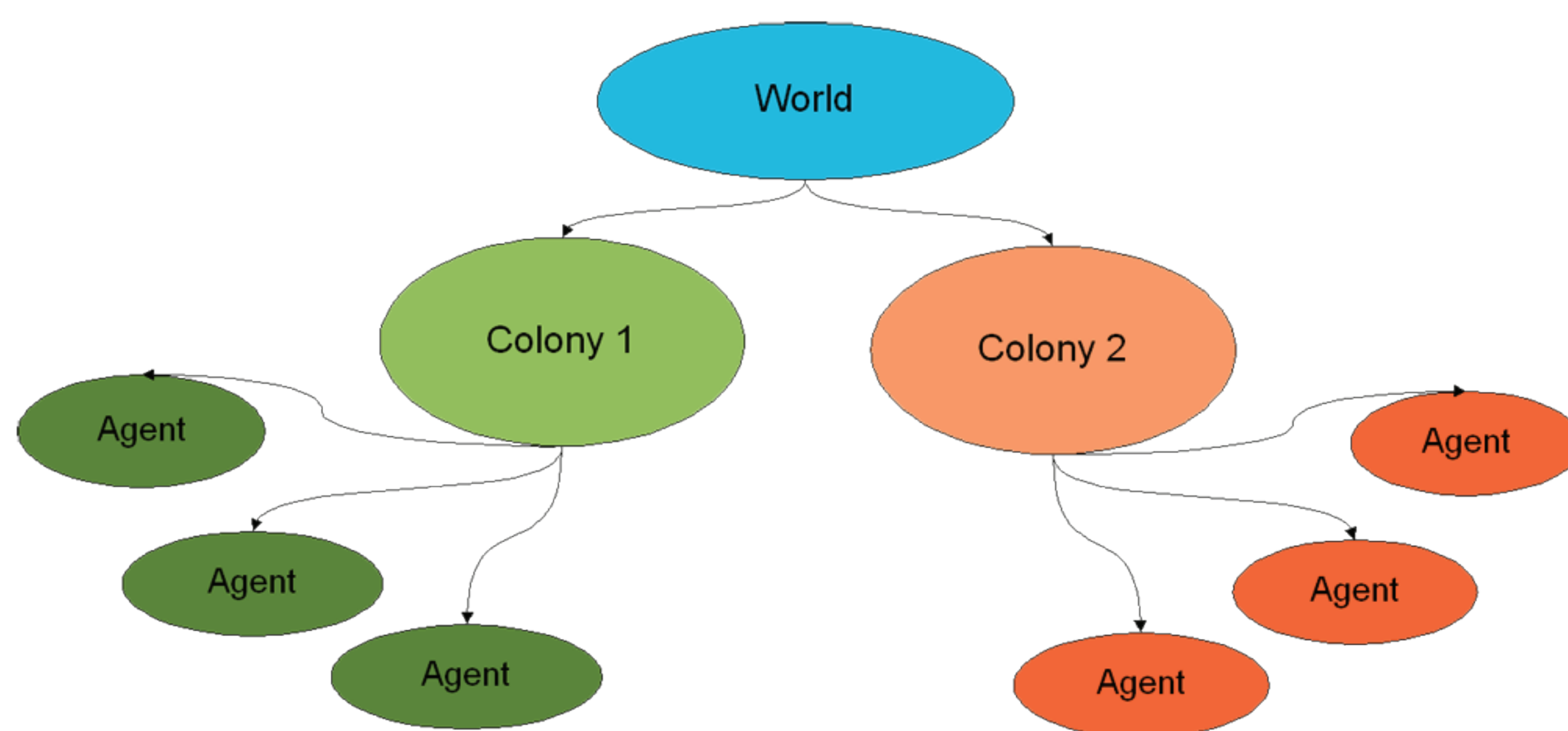
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Exploring Emergent Systems (E.E.S.) is the working title of a project that aims to be a valuable aid for teaching the concept of emergence through the intuitive, hands-on exploration and design of emergent systems. The tools being developed are also intended to remain useful beyond the learning phase, with particular emphasis on applications in the arts.

At the heart of E.E.S. is an easily extensible ActionScript 3.0 code library that can be used to create a wide variety of emergent models. An accompanying series of examples and library documentation make both emergence and E.E.S. easy to pick up and start exploring.

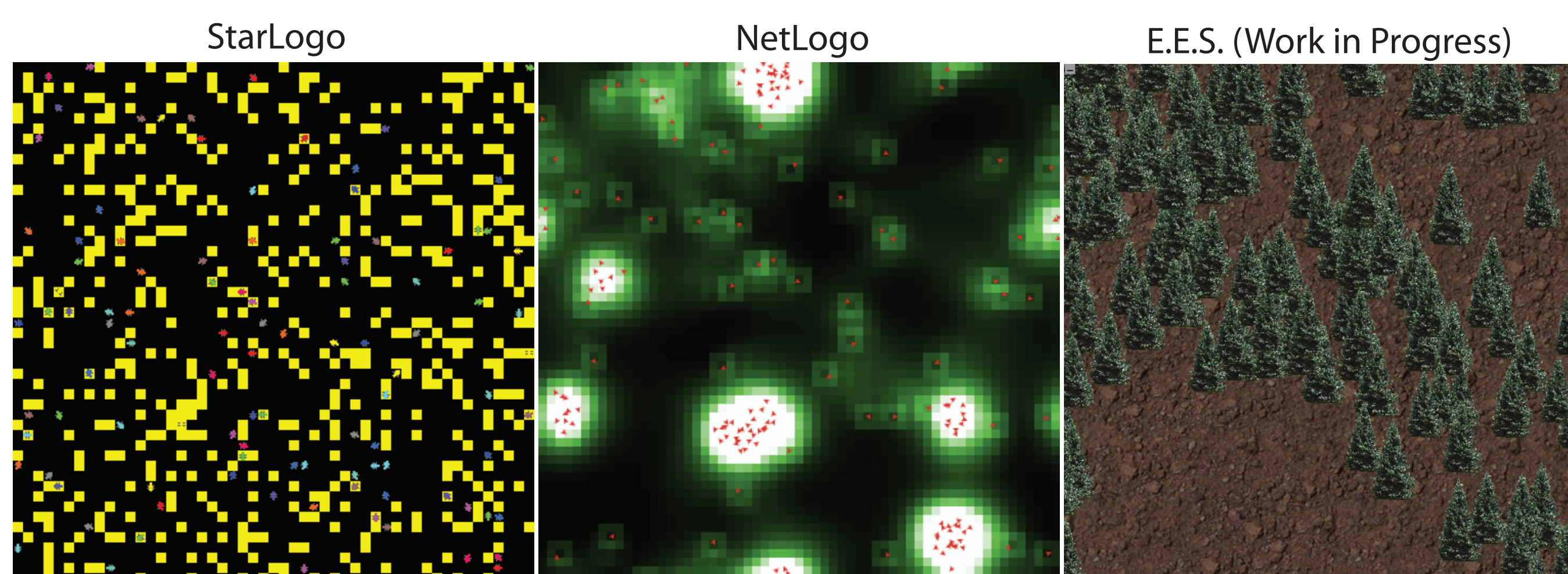
Agent-Based Structure



The E.E.S. code library is designed to let the end-user focus on the Agents, the moving parts of an emergent system. These are then grouped into Colonies, and those into a World container object. Both the Colony and World objects can also be extended to provide specialized functionality, such as the grid of a cellular automaton, but their primary role is to increase efficiency transparently, behind the scenes.

Multimedia Emphasis

This project is inspired in part by Mitchel Resnick's StarLogo and its sister program NetLogo. However, while those systems focus almost exclusively on conceptual modeling, our approach allows for full use of the extensive multimedia capabilities of Adobe's Flash to present emergent systems in new ways and among the dynamic context of the web.



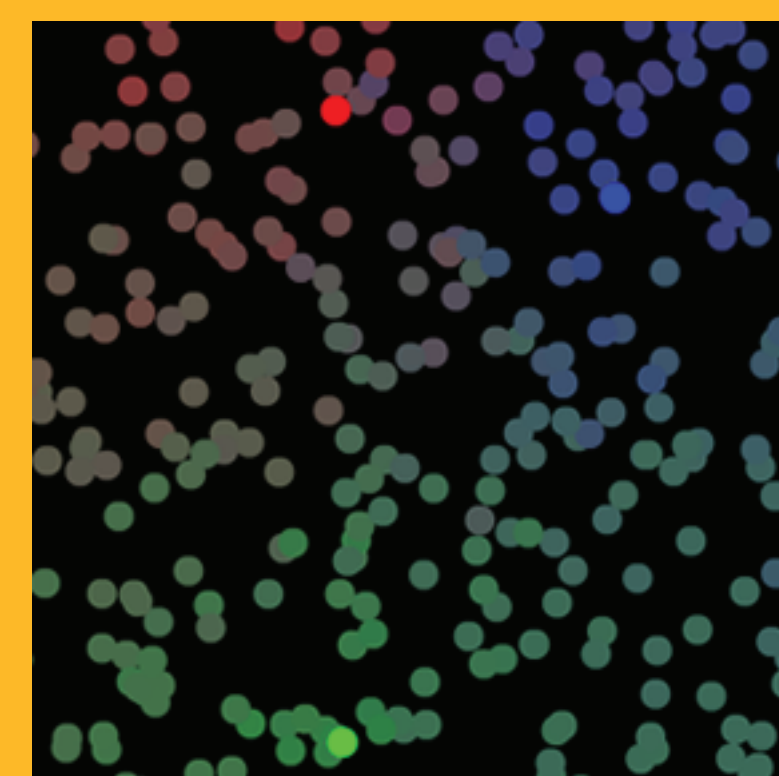
Typical visuals in StarLogo and NetLogo, and an E.E.S. model using photographic sprites; only the simplest use of Flash and ActionScripts' multimedia capabilities.

Prototype Models

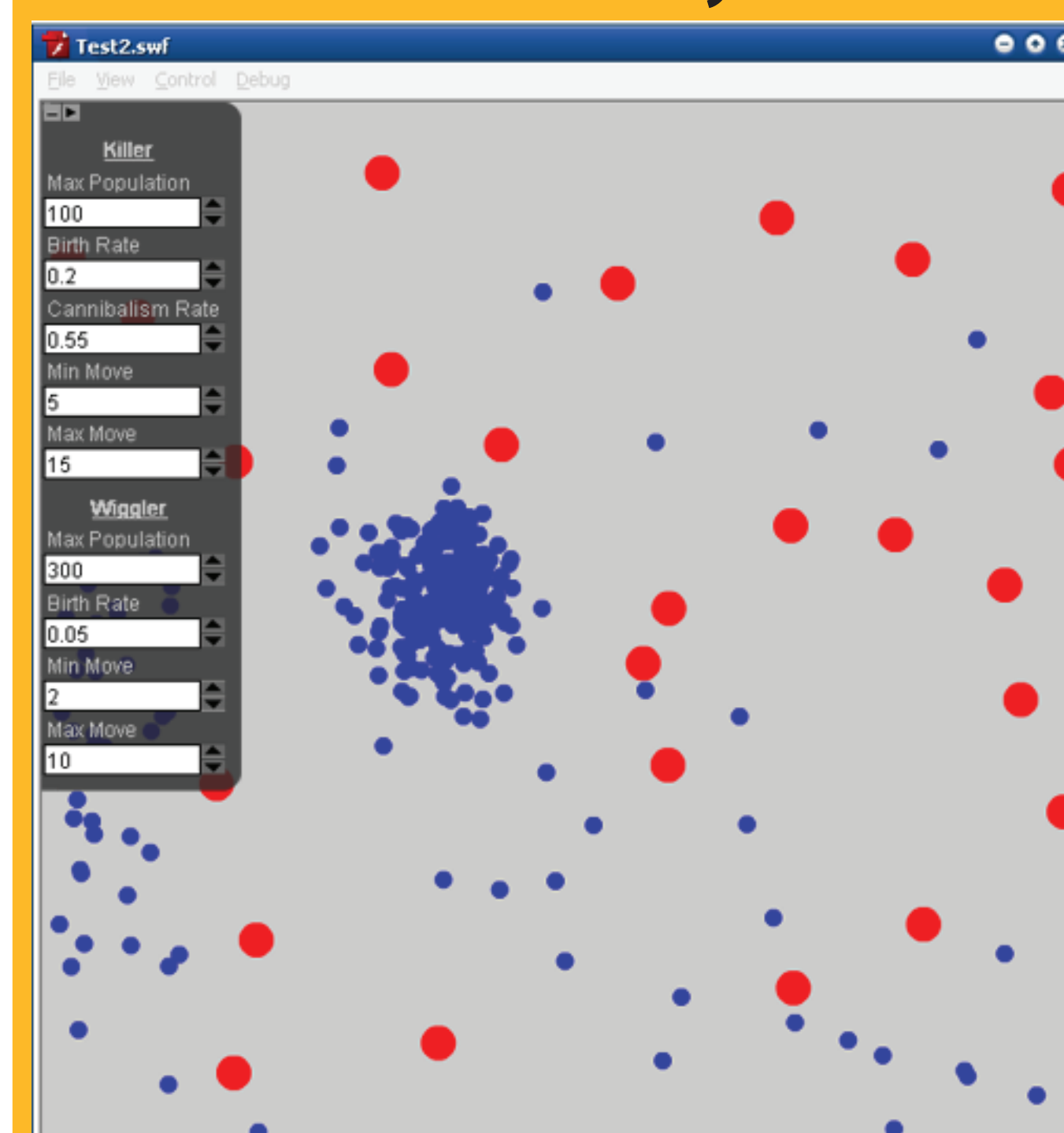
This early model features a simple color changing Agent that moves randomly, but appears to loosely self-organize.



These Agents have formed a basic social network. Color indicates their associations with the red, green, and blue Agents.



Constraints System



With just a few lines of code, the Constraints system allows the user to add key Agent variables to an optional, automatically generated control panel. This allows for real-time tracking and manipulation of these values, fundamental tools in the exploration of emergent behaviors.