Agent-Based Modeling with NetLogo: Exploring, Designing, and Building

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Introductory description and overall goals

NetLogo is a modeling environment that enables students and teachers to create agent-based models of *complex systems* – that is, systems that involve many interacting elements. NetLogo follows the Logo design philosophy of "low threshold and high ceiling," meaning that it provides a gentle learning curve for beginners by enabling students, teachers and curriculum developers to create their own "emergent" models of systems in terms of individual, embodied behaviors. There are also several model-based curricula that employ NetLogo at middle school, high school, and undergraduate levels. In this workshop, we will introduce participants to the NetLogo modeling environment, and how to use it to explore, design, and construct agent-based models.

Figure 1. NetLogo logo

Method

We will utilize a hands-on approach to learning ABM. We will start out with a discussion of ABM concepts, techniques and examples. We will also introduce participants to NetLogo's extended capabilities – including support for robotics and data collection, participatory simulation, and systematic model analysis. Workshop participants will be led together through the development of a basic model in the NetLogo environment. Finally, participants will have a chance to brainstorm and receive help and feedback in designing their own agent-based model.

Expected outcomes

The workshop is intended to serve the needs of both educators and researchers. No previous experience with NetLogo or programming is required for this workshop. The large variety of phenomena that can be explored with NetLogo will make this workshop a truly interdisciplinary experience. Participants will complete the workshop having built a basic NetLogo model and with the tools and access to information and resources for designing and building their own models.

Keywords

modeling, NetLogo, simulation, complex systems, agent-based modeling, programming