Each QUBES Resource of the Week highlights openly licensed materials shared by QUBES users and partners.

NetLogo, an agent-based modeling tool that can be run directly in your browser

By Uri Wilensky
Module Description:

This week’s featured resource is NetLogo, a multi-agent programmable modeling environment that can be run directly on the QUBES website. NetLogo allows users to impose simple rules on individual “agents”, explore the behavior of the individual agents under various conditions, and observe the impact of agents’ behavior on the system as a whole.

NetLogo is simple enough for use by students and teachers but robust enough for use as a research tool. Modelers can use NetLogo to create new simulations or use and adapt the many existing simulations in the NetLogo Models Library which address a variety of topics in biology, chemistry, physics, mathematics, computer science, economics, and social psychology. Each model in the library has a “Things to Try” section with suggestions for exploring the system, which can be used by students as it is or used by teachers to inspire a more extensive activity. A detailed NetLogo User Manual with tutorials is also available to help users get started with the software.

NetLogo was written by Uri Wilensky, the director of the Center for Connected Learning and Computer-Based Modeling at Northwestern University, where NetLogo is being maintained. NetLogo can be freely downloaded at http://ccl.northwestern.edu/netlogo/ or run directly in your browser at NetLc Web or on QUBES at https://qubeshub.org/tools/netlogo.

Teaching Setting:

NetLogo models can be explored and revised as part of model-based inquiry in middle, secondary and undergraduate classrooms as well as serving as the
basis for research in more advanced settings.

Citation:

Related Materials and Opportunities:
This week’s featured resource is one of several QUBES-hosted software tools that can be run directly on the QUBES website.

Launch NetLogo.

You must be logged into your QUBES account to launch NetLogo. If you do not have a QUBES Hub account, register for one at www.qubeshub.org/register.

If you teach a course that includes agent-based modeling for scientists or...

Steven F. Railsback and Volker Grimm host an online community for instructors teaching classes using their book, to share resources and teaching strategies, collaborate with other users, and provide feedback about their experiences using the book. If you currently use the book or are interested in adopting it, please join the [Agent-Based and Individual-Based Modeling group](https://www.researchgate.net/profile/Steven_Railsback/publication/261482761/abstract/Agent-based-and-Individual-based-Modeling-A-Practical-Introduction/261482761.xml).

The authors have also partnered with QUBES to offer online professional development opportunities called [Faculty Mentoring Networks (FMNs)](https://www.qubes.org/) for teachers looking to gain experience with agent-based modeling or incorporate modeling into their courses in a manner that is approachable for math-phobic students. Check out their [2019 Agent/Individual-Based Modeling FMN](https://www.qubes.org/2019AgentIndividualFMN/) and [2015 Agent-Based Modeling FMN](https://www.qubes.org/2015AgentFMN/) to learn more about these FMNs. If you are interested in participating in an FMN in the future, please [subscribe to the QUBES newsletter](https://www.qubes.org/newsletter/) to receive information about upcoming FMNs.

If you are looking for additional teaching materials that use NetLogo, check these out!

- [Altruism Simulation Activity](https://www.example.com/altruism) - an animal behavior activity designed to support students’ exploration of the [NetLogo Altruism Model](https://www.example.com/altruism-model)
- [Ebola Model](https://www.example.com/ebola) - a NetLogo model of Ebola transmission in a population over time
- [Infections On NeTWorks (IONTW)](https://www.example.com/IONTW) - a NetLogo-based tool for teaching network models of disease transmission. Learn more about IONTW and explore related teaching materials in the [Exploring Transmission of](https://www.example.com/IONTW-exploration)
Infectious Diseases on Networks with NetLogo group.

You can find more NetLogo teaching materials in the QUBES collection of Open Education Resources.

If you adopt and adapt this module, you are highly encouraged to share your adaptation back with the QUBES community using the QUBES Resources System for sharing Open Education Resources.

QUBES is a community of math and biology educators who share resources and methods for preparing students to use quantitative approaches to tackle real, complex, biological problems.

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