Graduate Workshop on Agent-Based Modeling

Eindhoven University of Technology, 10am to 5pm, September 11, 2017

Instructor
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Workshop description
In this one-day, graduate-level workshop, students will learn about agent-based modeling and how it is applied to study social phenomena in human and animal societies. Agent-based models are widely used to help us understand a wide range of topics, including but not limited to cooperation, social learning, collective problem solving, opinion dynamics and polarization, segregation, the spread of disease, and the emergence of social norms. Students will receive an introduction to the philosophy of modeling and to some key models in the life and social sciences, and get hands-on experience writing and analyzing simulation models using NetLogo, a widely used software package for agent-based modeling.

Preparation
All students should bring a laptop computer. Before the workshop begins, you should download and install NetLogo, a free software tool for running and visualizing agent-based simulations. Available here: https://ccl.northwestern.edu/netlogo/

You will also benefit substantially by going through Tutorials #1-3 in the NetLogo User's Manual before the start of the workshop—**this is strongly recommended**. Going through all three tutorials will probably take you a couple of hours. The manual is bundled with the NetLogo download but also available separately here:
http://ccl.northwestern.edu/netlogo/docs/NetLogo%20User%20Manual.pdf

Tentative Schedule

10:00am – 11:00am	*Act I*, in which we are introduced to models, and to each other.
11:00am – 12:30pm	*Act II*, in which we are introduced to NetLogo.
12:30pm – 1:30pm	*Intermission*, in which we are fed and exchange pleasantries.
1:30pm – 2:00pm	*Act III*, in which we are treated to a guest lecture by Julia Eberlen.
2:00pm – 4:00pm	*Act IV*, in which we design, build, and analyze a simple model of diffusion.
4:00pm – 5:00pm	*Act V,* in which we discuss model assumptions, the relationship between modeling and empirical data, and the primacy of theory.

Suggested Readings

Though not required, the following recommended readings provide helpful introductions to models and modeling.

- Smaldino PE (2017) Models are stupid, and we need more of them. In: RR Vallacher, A Nowak, SJ Read (eds), *Computational models in social psychology* (pp 311–331). Psychology Press.
    - http://smaldino.com/wp/wp-content/uploads/2017/01/Smaldino2017-ModelsAreStupid.pdf
- Smaldino PE, Calanchini J, Pickett CL (2015) Theory development with agent-based models. *Organizational Psychology Review* 5(4): 300–317.
    - http://smaldino.com/wp/wp-content/uploads/2015/10/SmaldinoEtAl2015-OPR-TheoryDevelopmentWithABMs.pdf
- Epstein JM (1999) Agent-based computational models and generative social science. *Complexity* 4(5): 41–60.
    - http://www.uvm.edu/~cdanfort/csc-reading-group/epstein-complexity-1999.pdf
- Eberlen J, Scholz G, Gagliolo M (2017) Simulate this! An introduction to agent-based models and their power to improve your research practice. *International Review of Social Psychology* 30(1): 149–160.
    - https://www.rips-irsp.com/article/10.5334/irsp.115/
- Wang XF, Chen G (2003) Complex networks: Small-world, scale-free and beyond. *IEEE Circuits and Systems Magazine* 3(1): 6–20.
    - http://rakaposhi.eas.asu.edu/cse494/scalefree.pdf
- Grimm V, et al. (2005) Pattern-oriented modeling of agent-based complex systems: Lessons from ecology. *Science* 310: 987–991.
    - http://econ2.econ.iastate.edu/classes/tsc220/hallam/AgentBased%20Complexystems_Science2005.pdf