Introduction to Spatial Agent-Based Modeling

Deadline:
Sep 09, 2016

When: December 5-9, 2016

Where: The National Socio-Environmental Synthesis Center (SESYNC), Annapolis, Maryland.

Important Dates:
>   Deadline for applications: September 9, 2016, 5pm EST;
>   Notification of acceptance by September 16;
>   Registration fee due by September 30.

The National Socio-Environmental Synthesis Center (SESYNC), located in Annapolis, Maryland, invites applications for a 5-day short course that will serve as an introduction to the theory and practice of spatially-explicit agent-based modeling (ABM). Participants will learn the essential theoretical background and technical expertise needed to conceptualize, build, and analyze your first ABM. This course will act as a guide through the basic phases of the ABM research process: formulating a research question, specifying a model, creating a simulation and interpreting the output. The course combines lectures with hands-on model-building sessions where you will build a model using NetLogo to acquire basic and intermediate programming skills. More advanced students are welcome to build a model in a programming language of their choice. This will be an intensive, week-long immersion in ABM concepts and methods with reading and short writing assignments each day, and a 'final project' consisting of a simple model and standardized documentation to be published in the OpenABM (www.openabm.org [1]) repository.

This course is intended as a foundational course for anyone interested in adding ABM to their analytical toolkit, regardless of prior modeling experience. Much of the course material and lessons will emphasize spatial ABM for understanding the dynamics and interdependencies of humans and natural systems (i.e., socio-environmental (S-E) systems). Applicants whose research or teaching focus on such topics will be given preference, but applicants with other areas of interest are also welcome. The course material will be structured for students with little to no experience with agent-based modeling and/or programming, but it could also be of interest to researchers/faculty with limited agent-based modeling experience. Target class size is 12-15 people, so space is limited.

Topics:

ABM Theory

- Essential background: What are S-E systems, and why are ABMs one of the best tools for understanding them?
- Building blocks of spatial processes: forces of attraction and segregation, individual mobile entities,

and processes of spread.

- Building blocks of computational social science: objective functions, decision-making theories and models, social networks, and agent learning.

Model Development

- Designing and building an ABM: model development objectives and best practices, including using the standardized Overview, Design concepts, and Details (ODD) protocol for model documentation.
- Code version control with git repositories
- Interfacing models with spatial databases, harmonizing spatial and non-spatial data for model parameterization.

Model Analysis

- Concepts and methods for model evaluation: explanation versus prediction, multifinality and equifinality, outcome and structural accuracy, pattern-oriented modeling.

Costs:

Registration fees are $100 for graduate students and postdocs and $250 for faculty and all others*. Financial assistance for the registration fee and/or flights and hotel costs for non-local participants is available in accordance with [our travel policies](#) [2], but requires a formal application demonstrating a clear need for assistance (see **To Apply** below). Applicants from developing countries or smaller academic institutions will be prioritized for assistance. Additional eligible travel expenses (e.g., meals and ground transportation) will be reimbursed for all attendees by SESYNC upon the completion and publishing of model code and description on OpenABM. **All participants are expected to build and submit a completed model and model description by January 31, 2017.** Please note that while ample time will be provided during the course for model-building, producing a working model and accompanying documentation is a time consuming process and completion will likely require additional time beyond the duration of the course.

* Cancellation with full refund of registration fee is possible until October 31, 2016. Cancellations after this date will not receive a refund.

Submission Instructions:

To Apply:

Applicants should submit an application online: http://sesync.us/sabm [3]. The online application includes questions about your interests and expectations for the course, your background, and a resume or CV. Response to application questions should explain how the course relates to the applicant's work, a brief description of the system or problem they would like to model, and how this course's content and intensive structure will benefit their work. Participants will be selected based on likelihood to benefit from the course, and how well background, interests, expectations, and idea for a simple model fit with the course material. Additional factors such as career stage, research field, ethnicity, and gender will also be considered to ensure diversity.

If *travel assistance* is requested, space will be provided in the online application form to describe the applicant's circumstances that clearly demonstrate the need for financial assistance.

For more information, please direct questions to Nicholas Magliocca: nmagliocca@sesync.org [4].

The University of Maryland is an Equal Opportunity Employer

Minorities and Women Are Encouraged to Apply