Newly certified models in the CoMSES model library and newly published models added to the model library.

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CoMSES Digest: Spring 2015

Volume 3, No.1   December 15, 2014 – March 15, 2015

Dear CoMSES members,

As the CoMSES Digest begins its third year, CoMSES as an organization makes a strong move forward. The Interim Executive Board has been replaced with the new Executive Board. They are:

 Bruce Edmonds
 Volker Grimm
 Mariam Kiran
 Christophe Le Page
 Gary Pohill
 Bill Rand

The new Board members will serve staggered terms: Grimm and Edmonds will serve through 2015, Le Page and Rand will serve through 2016, and Kiran and Polhill will serve through 2017. In addition, I will serve as an ex officio member and as the Digest editor, through 2016.

This new Board sees a continuation of the service of the Interim Board members, but welcomes Mariam Kiran and Gary Polhill, who are both the newest members and those who will be the first to serve full three year terms (which will be the norm for all subsequent elections, after the initial staggered and shortened terms end in 2015 and 2016). Thanks are due to all those who ran in and voted in the CoMSES Board elections.

The Board met recently to plan new fronts for CoMSES, including outreach at several upcoming conferences and the possibility of organizing sessions at specific conferences; some of these are slated for later in 2015. Board members were also updated about the improvements to the model archive and OpenABM web site- expect more announcements about this soon. The Board also heard more about an ongoing research project: Marco Janssen and his students have been reviewing current research model archiving practices to determine the frequency and modes of model distribution and storage. It is an unfortunate fact that not all modelers use OpenABM, and not all journals recommend or require model archiving; Janssen's research will show the rates at which models are being archived in different ways (e.g. personal web pages), and will give quantitative support for extending the reach of OpenABM and the CoMSES community.

Model library contributions since the last Digest in December include 15 newly submitted models- a new high for a single quarter since the Digest was begun- and 2 newly certified

ones. Jonathan Paige submitted one of the certified models, an archaeological model of lithic raw material procurement, a venerable topic in archaeological simulations, this time including two distinct groups of foragers and camp dwellers. Chloe Atwater contributed a model of shellfish exploitation in American Samoa; both the topic and the location are appearing in the model collection for the first time. These models have been certified to meet standards for reproducibility and documentation (Model Certification Guidelines).

The Atwater model addresses 1500 years of foraging, and is therefore, like the Paige model, in the domain of archaeology. The newly contributed models span a wider range, encompassing energy capture in ecosystems, the formation and evolution of social networks, sustainable and eco-friendly behaviors, and economic interactions among individuals and in markets, to select a few. Also notable: a NetLogo code profiler; a model used to teach middle and high school students about atomic radii, and an intriguing model about murder among ants. For the full list, see the links below.

The high number of contributions this quarter is extremely encouraging; it more than triples the number of submissions during the same period last year. As the Digest continues we will track these trends, and see, for example, whether submissions correspond to cycles in the academic calendar. If your students are working on their projects for the Spring semester, we encourage you to direct them to the model library for inspiration and examples as they start their models, and to share and certify their models when they are complete.

Best Regards,
John T. Murphy
CoMSES Digest Editor

Newly Certified Models in the Model Library

Lithic Raw Material Procurement and Provisioning


Jonathan Paige
Quantitative models of lithic technology tend to focus on hunter-gatherers as subjects of study. This model adopts and modifies some concepts from the literature on the organization of technology among hunter-gatherers to groups that have permanently occupied villages. The model is designed to evaluate the effects of individual mobility, core reduction technology, availability of lithic raw material, and forecasting of raw material shortages on the amount of work individuals are able to perform both at permanent settlements, and during movement across the landscape to and from those settlements
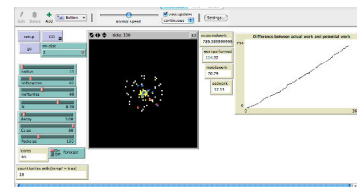
Simple Coastal Exploitation in the American Samoa

Chloe Atwater
This purpose of this model is to distinguish between anthropogenic and climate-driven patterns of shellfish
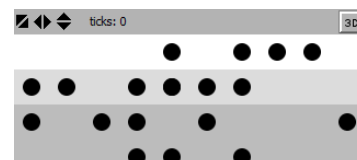
exploitation over the last 1500 years at Tutuila Island, American Samoa. The model employs optimal foraging theory principles to generate predictions of which habitats are exploited in climatically stable versus variable environments. Results imply that the radius of foragers' ability to sense the quality of their environment determines which habitats they spend most of their time in.
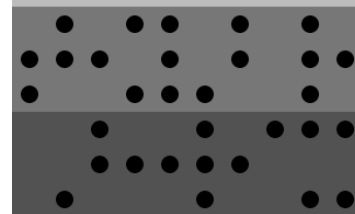
More Information About Model Certification

Newly Published Models in the Model Library

The Agent-Based Model of the Closed Market (similar to Stock Market) with One Commodity and with careful and risky mechanisms

Mark M Voronovitsky
The model of market of one commodity , in which there are in each moment of time the same quantity and the same quantity of money was formulated and researched in this text. We also study this system as a game of automata.

Exploring organizational learning in innovation networks. An agent-based model

Sandra Schmid
The model's underlying basic assumption is that firms need to innovate in order to survive in their market. Developing novel knowledge for potential innovations by collaborating with other firms is thus the intrinsic motivation of each firm participating in the innovation collaboration.
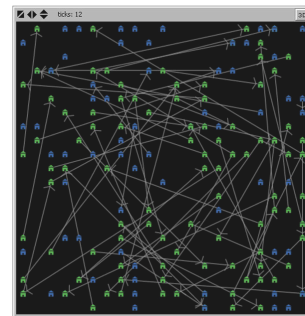
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Netlogo Profiler code example

Colin Wren

This is a very simple foraging model used to illustrate the features of Netlogo's Profiler extension.

A Model of Iterated Ultimatum game

Andrea Scalco

The simulation generates two kinds of agents, whose proposals are generated accordingly to their selfish or selfless behaviour. Then, agents compete in order to increase their portfolio playing the ultimatum game with a random-stranger matching. The amount of money to divide inside the ultimatum game is fixed at 100.00 €. The first group acts in a selfish way, that is, their proposals are always generated randomly under the 50% of the amount of money to split (more in detail, their proposals range from 35.00€ to 45.00€). Conversely, the second group behaves in the opposite way: indeed, altruistic agents bid higher, even over the half of initial amount of money (particularly, proposals randomly range from 45.00€ to 55.00€).

## Social and ecological feedback in greening behavior

Athena Aktipis

We construct an agent-based model to investigate and understand the roles of green attachment (which encompasses place attachment and biophilia), engagement in local ecological investment (i.e., greening), and social feedback (where individuals who observe greening become more likely to engage in it). We model this socio-ecological feedback process, basing our parameters and assumptions on real-world data and grounding our model in the Tremé neighborhood of New Orleans.

TELL ME: protective behaviour in an epidemic

Jennifer Badham

This is a prototype simulation developed for the TELL ME project about health communication to encourage protective behaviour during influenza epidemics. Decisions to adopt (or drop) protective behaviour consider the agent's attitude, adoption by other nearby agents and the proximity of the epidemic.
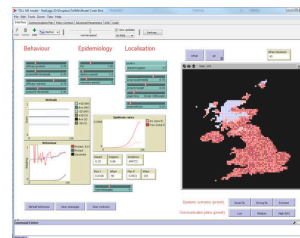
Maximum Power Principle: OamLab V1.07

Garvin H Boyle

I have developed an abstract Open Atwood's Machine (OAM) which can be formed into linked chains of OAMs. In a quasi-Darwinian competition for a scarce resource (space), these chains capture and expend energy, reproduce via fission, and mutate. In a second

mode of operation, the fitness of each chain is computed, and the less fit offspring discarded. In either mode, the main tenet of the MPP is exhibited: when fitness is based on both time to reproduce and efficiency of energy use, maximum power is achieved at an efficiency of ~50%, and the efficiency of the components of the system (the OAMs) converges to that common value.

## Agent-Based Model of Corruption: Micro Approach

Valery Dzutsati

The model explores the conditions for an endogenous social transition from a high-corruption state to a low-corruption state. The majority of researchers focus on the effects on corruption, while this model specifically addresses the issue of dynamics of corruption..

Atomic Radius

Kit C. Martin, Ashlyn Karan

This purpose of this model is to distinguish between anthropogenic and climate-driven patterns of shellfish exploitation over the last 1500 years at Tutuila Island, American Samoa. The model employs optimal foraging theory principles to generate predictions of which habitats are exploited in climatically stable versus variable environments.
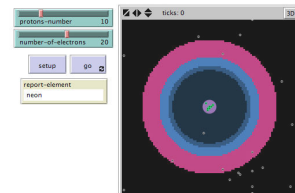
Umwelten Ants

Kit C. Martin

Leafcutter ants, Atta cephalotes, are dominant herbivores in South American rainforests and have a diverse life history, punctuated by their fungal spore farming which results in often massive colony sizes (Hölldobler & Wilson, 2010). When observing A. cephalotes colonies near Manaus, Brazil, the author watched three colony members kill each other.

## Demographic microsimulation for individuals and couples

Sabine Zinn

We present a simulation approach which models and simulates life courses of individuals and couples and conducts mate matching. To define individual and couple behavior we use a continuous-time multi-state model, that is, we use a continuous-time microsimulation model.

The Planned Recycling Behavior model (PRB_1.0)

Andrea Ceschi

A simulation model on planned recycling agent behavior (PRB_1.0) which creates a virtual district with different agent types, waste generation and collection processes.
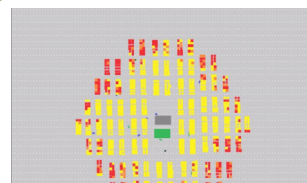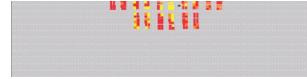
Homophily-driven Network Evolution and Diffusion

Mustafa Yavaş and Gönenç Yücel

The model is an experimental ground to study the impact of network structure on diffusion. It allows to construct a social network that already has some measurable level of homophily, and simulate a diffusion process over this social network.

Social trust model

Di Wang, Alistair G Sutcliffe

This is a social trust model for investigating the social relationships and social networks in the real world and in social media.

Most Downloaded Models in the Model Library

 (December 15, 2014 – March 15, 2015)

1. (75 Downloads) Diet breadth model from Optimal Foraging Theory (Human Behavioral Ecology) *by C. Michael Barton*

2. (53 Downloads) Artificial Anasazi *by Marco A. Janssen*

3. (48 Downloads) Torsten Hägerstrand's Spatial Innovation Diffusion Model *by Sean M. Bergin*

4. (47 downloads) (Policy induced) Diffusion of Innovations - An integrated demand-supply Model based on Cournot Competition *by Martin Rixin*

5. (40 downloads) A consumer-demand simulation for Smart Metering tariffs (Innovation Diffusion) *by Martin Rixin*
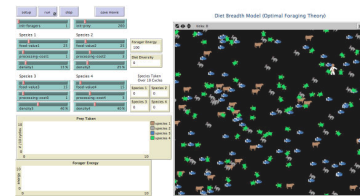
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