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CoMSES Digest: Fall 2015

Volume 3, No.3 June 16, 2015 – September 15, 2015

This is the Fall 2015 issue of the CoMSES Digest, and it brings good news on two fronts: first, a generous number of models were uploaded and certified during the past three months, and downloads were high as well; second, CoMSES is hosting a conference session to discuss models and modeling in science and the potential collaborative roles in this that CoMSES members can play.

Newly Certified and Newly Posted Models, Downloads

Three models have been newly certified- the largest total since the first CoMSES Digest issue. Mark Moritz and colleagues have had certified a NetLogo simulation of pastoral mobility, which they used for a paper that was published in the April 9th issue of Ecological Modeling. The model posits that given a set of assumptions about the information flow and decision-making processes among pastoralists sharing common-pool resources, and ideal free distribution may result. Kit Martin has has received certification for an earlier model in which leafcutter ants engage in intra-colony competition- and even kill each other- despite being genetically related. And Shade Shutters and David Hales have received certification for a model of the emergence of altruism in a population where individuals can consider themselves more or less similar to others based on 'tags', and use these tags to determine their willingness to engage in altruistic acts. In all three cases, the model certification indicates that these models are confirmed to run as described and to be documented and accessible to the wider modeling community. For those of you teaching courses in agent-based models, socio-ecological systems modeling, or complexity, look to these and other certified models for good examples for your classes.

Eight new models were added to the library, covering a wide range of topics, including voter turnout, pedestrian movement, vehicle purchase choice, and cultural transmission, inter alia. Resource management is explored via simulation (Waring et al.) and by asking individuals to engage in role-playing (Le Page et al.). A new implementation of SugarScape is offered by Watts, and Bianchi and Squazzoni simulate a topic of importance to all of us: peer review in the scientific process.

The five most downloaded models are listed below; four are returning to the list from previous months- the model in the top spot, a model of the diffusion of innovations, tariffs, and smart meters by Martin Rixin, was fourth on the very first CoMSES Digest list in Fall 2013, and reached the second spot in Winter 2014- and these are joined by a newcomer to the list, a model of the 'beer game' by Mert Edali and Hakan Yasarkan.

Conference on Complex Systems

At the upcoming Conference on Complex Systems, CoMSES leaders Marco Janssen and Michael Barton have organized a session on "Computational Transparency in Modeling Complex Systems." This session will focus on the importance of the work that CoMSES and OpenABM have undertaken via the platforms they use to archive and distribute socio-ecological models. Presentations include:

- Current Archiving Practices with Agent-Based Models (Marco Janssen, Allen Lee)

- Sharing Specifications (Christian Collberg)

- Ordnung! Standards That Facilitate Model Communication and Formulation (Steven Railsback)

- Modular ABM in NRM for Improved Dissemination and Training (Andrew Bell)

- Life Cycles of Scientific Simulation Models: From Transparency and Reproducibiliy to Longevity and Theory (John Murphy)

- Cyberinfrastructure for Visualizing Model Outputs (Dawn Parker, Michael Barton, Terrance Dawson, Tatiana Filatova, Xiongbing Jin, Allen Lee, Ju-Sung Lee, Lorenzo Milazzo, Calvin Pritchard, Gary Polhill, Kirsten Robinson, Alexey Voinov)

- Multi-platform Training Sessions to Teach Agent-Based Simulation (Christophe Le Page, Géraldine Abrami, Nicolas Becu, Pierre Bommel, Bruno Bonté, François Bousquet, Benoît Gaudou, Jean-Pierre Müller, Patrick Taillandier)

- Big Data and Agent-Based Modeling (William Rand)

- Lessons Learned from Communicating Modelling Efforts in Big SES Projects (Sui Phang, Sarah Laborde, Ahmadou Mouzamou, Michael Durand, Alfonso Fernandez, Ian Hamilton, Bryan Mark, Ningchuan Xiao, Roland Ziebe, Mark Moritz)

- The Issues of Model Portability on Multiple Hardwares and Where Cloud Can Help (Mariam Kiran)

For more information, see: http://www.ccs2015.org/satellite-computational-transparency-

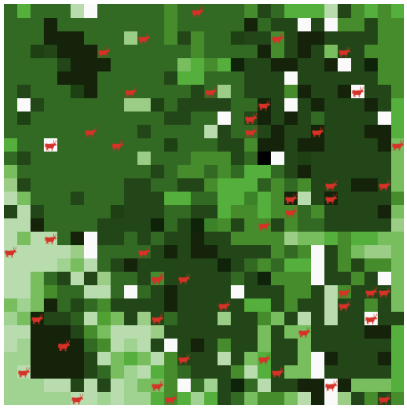
in-modeling-complex-systems/. The topics to be presented include a mix of reviews of the state-of-the-art and views into the future of SES modeling, and we are looking forward to an exciting and interesting session. We at CoMSES hope that many of you will be able to attend.

Many of the authors presenting in this session are also CoMSES board members, and the CoMSES board will be meeting face-to-face while in Tempe and will be help shape the organization's strategy for 2016 and beyond. The Winter 2015 issue of CoMSES Digest will include a report on this.

Warm (autumn) regards,
John T. Murphy
CoMSES Digest Editor

Newly Certified Models in the Model Library

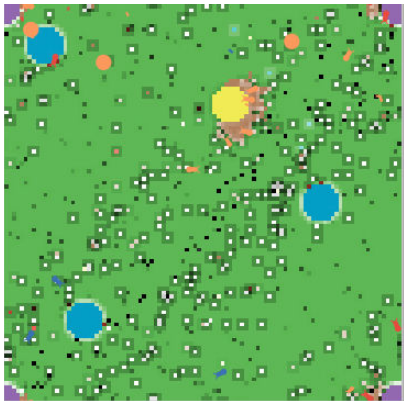
Ideal Free Distribution of Mobile Pastoralists in the Logone Floodplain, Cameroon



Mark Moritz, Ian M Hamilton, Andrew Yoak, Hongyang Pi, Jeff Cronley, Paul Maddock

The purpose of the model is to examine whether and how mobile pastoralists are able to achieve an Ideal Free Distribution (IFD). Our hypothesis is that an ideal free distribution will emerge when camps with complete information, freedom and ability to move, and independent decision-making capabilities, have open access to depletable common-pool resources that are highly variable is space and time. In the model we compare three simple movement rules and examine how successful they are in achieving an IFD.

Umwelten Ants

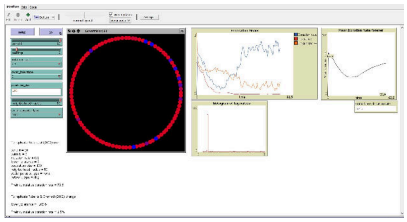


Kit C Martin

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. In ant colonies, sterile workers cooperate to rear colonial young, which means that these colony mates were related, and so should not engage in intra-colony competition because of the associated net loss (Townsend et al., 2008). If fitness in a biological system is comparable to profit in an economy (Holland, J., 2006), how can ant colonies of A. cephalotes in Brazil kill their nestmates for a net loss? The simulation models this interaction Through Netlogo.

The emergence of tag-mediated altruism in structured societies



Shade T. Shutters, David Hales

In this highly abstract model, agents occupy the nodes of a static network and exhibit an arbitrary “tag” that can be observed by others in the agent’s local environment. During the simulation agents pair with others in the local neighborhood and in each pairing one agent takes on the role of donor and the other of recipient. The donor first determines how similar it is to the recipient by calculating the difference between their tag values. If this difference is too great, the donor ignores the recipient. But if they are sufficiently similar, the donor pays a cost in order for the recipient to receive a benefit. Thus a donation is altruistic.

More Information About Model Certification

Newly Published Models in the Model Library

Peer Review with Multiple Reviewers

Federico Bianchi, Flaminio Squazzoni
This ABM looks at the effect of multiple reviewers and their behavior on the quality and efficiency of peer review. It models a community of scientists who alternatively act as “author” or “reviewer” at each turn.

Walk This Way

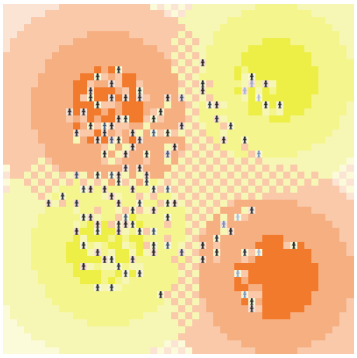
Crooks Andrew, Sarah Wise
The purpose of this model is to enhance a basic ABM through a simple set of rules identified using the activity-driven models in order to produce more realistic patterns of pedestrian movement.

(De-)Stabilising effect of diffusions

J. Kasmire, Bert van Meeuwen, Cornelis Eikelboom

The model represents a complex, communicating network in which agents represent vehicle owners. Each owner purchases new vehicles when the current vehicle expires on the basis of their adopter characteristics, their past history of vehicle purchases, the vehicles they observe among their neighbours, and the available vehicle options.

SugarscapeCW



Christopher Watts

A replication in Netlogo 5.2 of the classic model, Sugarscape (Epstein & Axtell, 1996).

A Simplified Model of Voter Turnout

*Luis F Lafuerza, Louise Dyson, Bruce Edmonds, Alan J McKane*This is a simplified version of a Complex Model of Voter Turnout by Edmonds et al.(2014). It was developed to better understand the mechanisms at play on that complex model.

REHAB: A Role Playing Game to Explore the Influence of Knowledge and Communication on Natural Resources Management

Christophe Le Page, Anne Dray, Pascal Perez, Claude Garcia

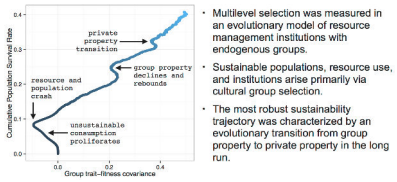
REHAB is a principle-based computer-assisted role-playing game, both cooperative and competitive, highlighting the role of knowledge production and communication for the conservation and management of natural resources. It does so through experiential learning, pitching players as Harvesters or Rangers in an abstract representation of a landscape where a resource is distributed in discrete units of Biomass.

Cultural Group Selection of Sustainable Institutions

Timothy M Waring, Sandra H Goff, Paul E Smaldino

We develop a spatial, evolutionary model of the endogenous formation and dissolution of groups using a renewable common pool resource. We use this foundation to measure the evolutionary pressures at different organizational levels.

Seasonal Social Networks and Learning Opportunities Under Unbiased Cultural Transmission

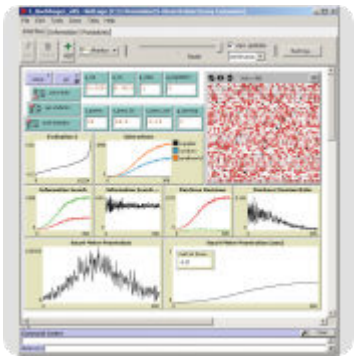


Adam N Rorabaugh

This agent-based model examines the impact of seasonal aggregation, dispersion, and learning opportunities on the richness and evenness of artifact styles under random social learning (unbiased transmission).

Most Downloaded Models in the Model Library

(June 16, 2015 – September 15, 2015)



1. (76 Downloads) A consumer-demand simulation for Smart Metering tariffs (Innovation Diffusion) ***by Martin Rixin***

2. (47 Downloads) A land-use model to illustrate ambiguity in design ***by Julia Schindler***

4. (44 downloads) (Policy induced) Diffusion of Innovations - An integrated demand-supply Model based on Cournot Competition ***by Martin Rixin***

3. (40 Downloads) MayaSim: An agent-based model of the ancient Maya social-ecological system ***by Scott Heckbert***

5. (40 downloads) A Mathematical Model of The Beer Game ***by*** **Mert Edali, Hakan Yasarcan**

We would like to thank the National Science Foundation for their support via grants (NSF BCS0623162 and GEO0909394).
