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

CoMSES Digest: Spring 2018

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From the Editor:

Greetings CoMSES Network! Welcome to a new year and a new volume (#6!) of the CoMSES Digest. Whether your winter has been placid or you've been snowed in multiple times, we hope you've been working on new models and simulations. This year we are looking ahead to more great work from the CoMSES Board and the CoMSES Network as a whole; see the entries under CoMSES News, and the Calendar of Events- a new section for the CoMSES Digest. (But don't wait to read about events the Digest: read- and add to!- the calendar at https://www.comses.net/events/calendar/, part of the new-and-improved CoMSES website.)

Warmest late-winter/early-spring wishes,
John T. Murphy,
CoMSES Digest Editor

CoMSES News:

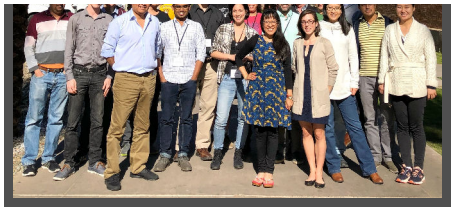
CoMSES Net at Department of Homeland Security Workshop

C. Michael Barton

At the end of February, I represented CoMSES Net at a workshop on Data Interoperability and Information Sharing for Security Operations in Changing Environments, sponsored by the Department of Homeland Security. I was almost the only academic in this meeting, which included representatives from multiple government agencies, law enforcement, and branches of the Department of Defense. This was a new environment for CoMSES Net, but nonetheless important for the mission of our network and the NSF Big Data Spoke program. The overall goal of the meeting was to map out strategies for greater transparency, knowledge sharing, and data sharing among federal agencies responsible for a wide range of national security contexts, from law enforcement to disaster response. Currently, data acquisition, analysis, and modeling are highly vertical within each agency or subdivision, with very little sharing of information or knowledge. In addition to needless duplication of effort and a lack of widely applicable best practices, this results in delayed or inappropriate responses, and increased risk of mishandling sensitive information. As a result of my long association with the CoMSES Net community, I was able to attest to the value of transparency and open knowledge sharing, with numerous potential benefits to the missions of the agencies involved. Ironically, in a context where the culture is one of secrecy and data protection, much of the information used is neither classified nor secret. All the agencies represented could better serve the American public by adopting some of the ideals that CoMSES Net promotes and enables. The controversy unfolding about the activities of Cambridge Analytica makes me wonder: how would the outcomes have differed for the multiple nations affected if the algorithms used for data acquisition, analysis, manipulation, and re-dissemination had been open, transparent, and accessible to any citizen or government instead of kept proprietary and secret? As a colleague at a scientific workshop last year on next generation modeling stated so well, 'If it is not open, it is not really science.' The CoMSES Net community is an international leader in the practice of open scientific computing. It is increasingly clear how important this endeavor is.

CoMSES Winter School 2018

The first week of January the second CoMSES Winter School on Agent-based Modeling and Social-Ecological Systems was held. 15 students from all over the world received lectures on different cutting edge topics of modeling social-ecological models and worked in group projects to advance and analyze existing ABMs of SESs. Stay tuned for the announcement of the CoMSES Winter School 2019 application process.



CoMSES ABM tutorial

March 7 CoMSES hosted a one-day long tutorial at the Tempe campus of Arizona State University (ASU) for beginners on agent-based modeling for participants of a conference (https://www.iasc-commons.org/event/ws-asu-working-together/) and students and faculty of ASU.

New CoMSES website launched

As many CoMSES members have noticed, we recently replaced openabm.org with a completely redesigned website, https://www.comses.net with support from the NSF West Big Data Hub program (http://westbigdatahub.org). We have migrated most of the content, preserved published links to models in the model library and set up redirects for popular areas of the website - please let us know at editors@comses.net if we have missed anything!

Upcoming features in development slated for release by the summer include minting DOIs for published model versions (now called releases), an improved peer review workflow, and the ability to follow jobs, events, computational models, research keywords, or other comses users via email digests or atom / rss feeds. If you have any suggestions to improve the site please feel free to contact us, again at editors@comses.net.

CoMSES Fellow Position available

CoMSES is a community based activity and therefore we are looking for a volunteer who will help with maintaining and extending the information on the relevant community resources on the CoMSES website, such as the list of ABM journals, ABM platforms and educational material. If you are interested you can contact us at editors@comses.net

From the Field:

Modeling the Emergence of Social Complexity

John T. Murphy

A workshop on the "Emergence of Societal Complexity through Human Environment Relations" (ESCHER) was held at TU Delft in February. Funded by the Wenner-Gren Foundation and organized by Joel Gunn (University of North Carolina- Greensboro) Maurits Ertsen (TU Delft), co-editor of the journal Water History, the workshop examined the emergence of social complexity in complex landscapes, specifically those in which

early occupants created irrigation systems. Far from parroting Wittfogel, the workshop looked at ways that simulation modeling could be leveraged to understand how the physical constraints of the canal system could be dealt with by social arrangements among the system's users. Additionally, the workshop scanned from the local scale to the global, and asked how the lessons learned at local scales could be used to understand the ways that the coupled human-earth system can be understood. Agent-Based Modeling will be a key part of this, but there was consensus that a full 'toolkit' for using ABM for this purpose does not yet exist; by a toolkit more than software is required: it would have to include everything from on-the-ground data to a community that would know how to use and interpret the modeling results. For a more complete account, see http://www.globalheritage.nl/news/how-to-model-human-decisions-in-irrigation-report-on-the-escher-workshop, and look forward to reports and papers soon.

From the Forums

General Forum

Title: Learn more about Git
https://forum.comses.net/t/learn-more-about-git/1000
Title: Humboldt State short course on individual/agent-based modeling, 30 July - 3 August 2018
https://forum.comses.net/t/humboldt-state-short-course-on-individual-agent-based-modeling-30-july-3-august-2018/2035
Title: Help! ABM and AI
https://forum.comses.net/t/help-abm-and-ai/2033
Title: 2018 Dresden short course in agent-based modeling
https://forum.comses.net/t/2018-dresden-short-course-in-agent-based-modeling/2031
Title: Why its worth learning FLAMEGPU for large scale agent based models?
https://forum.comses.net/t/why-its-worth-learning-flamegpu-for-large-scale-agent-based-modells/2030
Title: Help for Beginners to Verify Models
https://forum.comses.net/t/help-for-beginners-to-verify-models/2029

Jobs and Appointments

Note: Some of the postings have application deadlines that have already passed; we include all of them here for those who are curious about the state of the field, and remind those of you who may be actively searching for a new position that you can subscribe to this forum via the OpenABM website and receive these posts as soon as they are added. For the information listed here, be sure to check the deadline as given in the original post or from the institutions directly.

11 PhD positions in ‘Integrating Biodiversity Research with Movement Ecology in Dynamic Agricultural Landscapes [BioMove]’ https://www.comses.net/jobs/339/

NetLogo developer position
https://www.comses.net/jobs/338/

Associate professorship at the Université Grenoble Alpes
https://www.comses.net/jobs/337/

Max Planck Institute for Demographic Research Postdoc / Research Scientists
https://www.comses.net/jobs/336/

Research Fellow in Calibration and Data Assimilation for Agent-Based Models
https://www.comses.net/jobs/335/

University of Manchester Postdoc for Water-Energy-Food-Environment Systems
https://www.comses.net/jobs/334/

4 year PhD position on ABM for urban risk-prone areas
https://www.comses.net/jobs/333/

Two-year postdoc in agent-based modelling for population health
https://www.comses.net/jobs/332

Strengthening capacity for adaptation in agricultural water decision making
https://www.comses.net/jobs/331/

Post-Doctoral Position in Network Epidemiology and HIV Prevention Research at the University of Chicago
https://www.comses.net/jobs/330/

PhD position in (ABM) Environmental Economics at the University of New Hampshire
https://www.comses.net/jobs/329/

Postdoctoral Research Associate in (ABM)
https://www.comses.net/jobs/328/

Calendar of Events: March-June

Conferences and Workshops

Monday, April 9th - Saturday, April 14th:

Computation for Public Engagement in Complex Problems: From Big Data, to Modeling, to Action: (AAG, New Orleans) https://www.comses.net/events/455/

Wednesday, April 18th - Friday, April 20th:

Complexity and Policy Studies (CAPS) 2018 (Arlington, VA): https://www.comses.net/events/460/

Thursday, May 10th - Friday, May 11th:

IFAC workshop on Integrated Assessment Modeling for Environmental Systems (IAMES2018) (Brescia): https://www.comses.net/events/456/

Tuesday, May 22th - Friday, May 25th:

32nd European Conference on Modelling and Simulation (Wilhelmshaven,

Germany): https://www.comses.net/events/454 /

Friday, May 25th:

3rd IEEE Workshop on Parallel and Distributed Processing for Computational Social Systems (Vancouver): https://www.comses.net/events/462/

Friday, June 22nd - Saturday, June 23rd:

Computational Modeling in Philosophy (Munich): https://www.comses.net/events/473/

Sunday, June 24, 2018 - Thursday, June 28, 2018:

International Environmental Modelling & Software (Fort Collins): https://www.comses.net/events/459/

Tuesday, June 26th - Saturday, June 30th:

ACE at the Westerns Early Registration Deadline (Vancouver): https://www.comses.net/events/472/

Tuesday, June 26th - Saturday, June 30th:

Agent-based Computational Economics (Vancouver): https://www.comses.net/events/461/

Tuesday, June 26th - Sunday, July 1st, 2018:

Agent-based models: Linking complex social phenomena to social network dynamics [INSA Sunbelt] (Utrecht): https://www.comses.net/events/458/

Courses

Monday, May 14th - Friday, May 18th:

Spring School on Complex Networks (Villa del Grumello, Como, Italy): https://www.comses.net/events/467/

Submission Opportunities

Saturday, March 31st:

ESSA Social simulation conference 2018 (Stockholm): https://www.comses.net/events/466/

Sunday, April 1st:

Computational Modeling in Philosophy (Munich): https://www.comses.net/events/473/

Monday, April 16th:

Agent-Based Modelling of Urban Systems - ABMUS2018 (Stockholm): https://www.comses.net/events/478/

Tuesday, May 1st:

Socio-Cognitive Systems: Computational and Formal models (?): https://www.comses.net/events/479/

Tuesday, May 15th:

1st Workshop on Actors, Agents, Assistants, Avatars (4A'18): https://www.comses.net/events/468/

Friday, June 1st:

Change Management and Evolutionary Theory (course): https://www.comses.net/events/464/

Saturday, June 30th:

MISS-ABMS 2018 Early Registration Deadline: https://www.comses.net/events/474/

Registrations and Other Deadlines

Saturday, March 31st:

MISS-ABMS 2018 Early Registration Deadline: https://www.comses.net/events/474/

Sunday, April 1st:

Change Management and Evolutionary Theory (course): https://www.comses.net/events/464/

Saturday, May 5th:

Humboldt State short course on individual/agent-based modeling (course): https://www.comses.net/events/475/

Thursday, May 31st:

ACE at the Westerns Early Registration Deadline (Vancouver): https://www.comses.net/events/472/

Model Library

New Model Uploads

Twelve new models were contributed to the model library- matching last quarter's numbers. Takács and Squazzoni examine inequality in labor markets; Garvin Boyle provides a model that examines capital exchanges via the Entropic Index. Bernardo Furtado has submitted an exercise in which machine learning algorithms are trained using an ABM's input and output, and a second model with a larger team (Isaque Daniel Roche Eberhardt and Francis Tseng) that looks at metropolitan regions in Brazil, taxes, and quality-of-life. Yang Chen looks at land use and system resilience; Ruth Meyer looks at how 'Digital Do-It-Yourself' factories may disrupt current organizational structures in manufacturing. Kristin Crouse provides a useful pedagogical model that simulates population genetics, and a second one that simulates "Dawkins' Weasel". Stefan Mohr simulates the movements of visitors around Harz National Park (Germany). Lars Spång provides a cluster analysis tool. Johannes Marx simulates generalized trust "in the mirror", and the conditions under which such trust can emerge. Pascal Fust and Eva Schlecht examine the dynamics of ungulate foraging in drylands in the Rangeland Model in Drylands (RaMDry). J. Applegate and Glenn Hoetker model the fitness of firms on a landscape. Johannes Weyer, Robin D. Fink, and Andreas Ihrig have developed SimCo, the Simulation of the Governance of Complex Systems, examining macro-strategy and the control of complex infrastructures.

Most Downloaded Models

The most downloaded models include the venerable MayaSim and, moving from #2 to #1, the model of flood risk by Dubbelboer et al. that debuted last quarter. Sean Bergin's model of innovation and diffusion appears, but not for the first time: it made the top 5 in

Volume 1 and Volume 2 of the Digest, in 2013 and 2014. The Castilla-Rho model of the groundwater commons appears for a second time; the SimAdapt model by François Rebaudo makes its first appearance on the list.

New Model Uploads

Simulation of the Governance of Complex Systems

Fabian Adelt, Jahannes Weyer, Robin D Fink, Andreas Ihrig

Simulation-Framework to study the governance of complex, network-like sociotechnical systems by means of ABM. Agents' behaviour is based on a sociological model of action. A set of basic governance mechanisms helps to conduct first experiments.

Strategy with Externalities

Joffa Applegate and Glenn Hoetker

The SWE models firms search behaviour as the performance landscape shifts. The shift represents society's pricing of negative externalities, and the performance landscape is an NK structure. The model is written in NetLogo.

RaMDry – Rangeland Model in Drylands

Pascal Fust and Eva Schlecht

RaMDry allows to study the dynamic use of forage resources by herbivores in semi-arid savanna with an emphasis on effects of change of climate and management. Seasonal dynamics affects the amount and the nutritional values of the available forage.

Generalized Trust in the Mirror - a model on the Dynamics of Trust

Dominik Klein and Johannes Marx

This model studies the emergence and dynamics of generalized trust. It does so by modeling agents that engage in trust games and, based on their experience, slowly determine whether others are, in general, trustworthy.

Cluster Analysis

Lars Spång

This model illustrates how to apply a simple cluster-analysis on points distributed around 5 centers. The result can be displayed in shades of a color or a spectacular colored pattern.

Agent-based model for the socio-economic monitoring of visitor streams

Stefan Mohr

Due to the large extent of the Harz National Park, an accurate measurement of visitor numbers and their spatiotemporal distribution is not feasible. This model demonstrates the possibility to simulate the streams of visitors with ABM methodology.

Dawkins Weasel

Kristin Crouse

Dawkins' Weasel is a NetLogo model that illustrates the principle of evolution by natural selection. It is inspired by a thought experiment presented by Richard Dawkins in his book The Blind Watchmaker (1996).

Population Genetics

Kristin Crouse

This model simulates the mechanisms of evolution, or how allele frequencies change in a population over time.

DiDIY Factory

Ruth Meyer

The DiDIY-Factory model is a model of an abstract factory. Its purpose is to investigate the impact Digital Do-It-Yourself (DiDIY) could have on the domain of work and organisation. DiDIY can be defined as the set of all manufacturing activities (and mindsets) that are made possible by digital technologies. The availability and ease of use of digital technologies together with easily accessible shared knowledge may allow anyone to carry out activities that were previously only performed by experts and professionals. In the context of work and organisations, the DiDIY effect shakes organisational roles by such disintermediation of experts. It allows workers to overcome the traditionally strict organisational hierarchies by having direct access to relevant information, e.g. the status of machines via real-time information systems implemented in the factory. A simulation model of this general scenario needs to represent a more or less abstract manufacturing firm with supervisors, workers, machines and tasks to be performed. Experiments with such a model can then be run to investigate the organisational structure –- changing from a strict hierarchy to a self-organised, seemingly anarchic organisation.

External shocks, agent interactions, and endogenous feedbacks – investigating system resilience with a stylized land use model

Yang Chen

The purpose of the presented ABM is to explore how system resilience is affected by external disturbances and internal dynamics by using the stylized model of an agricultural land use system. We explore land system resilience with a stylized land use model in which agents' land use activities are affected by external shocks, agent interactions, and endogenous feedbacks. External shocks are designed as yield loss in crops, which is ubiquitous in almost every land use system where perturbations can occur due to e.g. extreme weather conditions or diseases. Agent interactions are designed as the transfer of buffer capacity from farmers who can and are willing to provide help to other farmers within their social network. For endogenous feedbacks, we consider land use as an economic activity which is regulated by markets — an increase in crop production results in lower price (a negative feedback) and an agglomeration of a land use results in lower

production costs for the land use type (a positive feedback).

Policy Space: agent-based modeling

Bernardo Furtado, Francis Tseng, Isaque Daniel, and Rocha Eberhardt

PolicySpace models public policies within an empirical, spatial environment using data from 46 metropolitan regions in Brazil. The model contains citizens, markets, residences, municipalities, commuting and a the tax scheme. In the associated publications (book in press and https://arxiv.org/abs/1801.00259) we validate the model and demonstrate an application of the fiscal analysis. Besides providing the basics of the platform, our results indicate the relevance of the rules of taxes transfer for cities' quality of life.

Machine Learning simulates Agent-based model

Bernardo Furtado

This is an initial exploratory exercise done for the class: http://thiagomarzagao.com /teaching/ipea/. Text available here: https://arxiv.org/abs/1712.04429v1 The program: reads output from an ABM model and its parameters' configuration, creates a socioeconomic optimal output based on two ABM results of the modelers choice, organizes the data as X and Y matrices, & trains some Machine Learning algorithms.

06 EiLab V1.40 – Entropic Index Laboratory

Garvin Boyle

There is a new type of economic model called a capital exchange model, in which the biophysical economy is abstracted away, and the interaction of units of money is studied. Benatti, Drăgulescu and Yakovenko described at least eight capital exchange models – now referred to collectively as the BDY models – which are replicated as models A through H in EiLab. In recent writings, Yakovenko goes on to show that the entropy of these monetarily isolated systems rises to a maximal possible value as the model approaches steady state, and remains there, in analogy of the 2nd law of thermodynamics. EiLab demonstrates this behaviour. However, it must be noted that we are NOT talking about thermodynamic entropy. Heat is not being modeled – only simple exchanges of cash. But the same statistical formulae apply.

High Standards Enhance Inequality in Idealized Labor Markets

Károly Takács

Takács, K. and Squazzoni, F. 2015. High Standards Enhance Inequality in Idealized Labor Markets. Journal of Artificial Societies and Social Simulation, 18(4), 2, http://jasss.soc.surrey.ac.uk/18/4/2.html. We built a simple model of an idealized labor market, in which there is no objective difference in average quality between groups and hiring decisions are not biased in favor of any particular group. Our results show that inequality in employment emerges necessarily also in such idealized situations due to the limited supply of high quality individuals and asymmetric information. Inequalities are exacerbated when employers have high standards and keep only the best workers in house. We found that ambitious workers get higher quality jobs even if ambition does not correlate or even negatively correlates with internal quality. Our findings help to

corroborate empirical findings on higher employment discrepancies in high rather than low status jobs.

Most Downloaded Models in the Model Library

(December 16, 2017 – March 20, 2018)

1. (123 Downloads) An Agent-Based Model of Flood Risk and Insurance ***by J Dubbelboer, K Jenkins, I Nikolic, and J Hall***

2. (88 Downloads) The Groundwater Commons Game ***by Juan Castilla-Rho & Rodrigo Rojas***

3. (80 Downloads) SimAdapt ***by Francois Rebaudo***

4. (72 Downloads) Torseten Hagerstrand's Spatial Innovation Diffusion Model ***by Sean Bergin***

5. (61 Downloads) MayaSim: An agent based model of the ancient Maya social-ecological system ***by Scott Heckbert***

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