CoMSES Digest: Spring 2019

Volume 7, No. 1 December 16, 2018 – March 15, 2019

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Editor's Note

Greetings from CoMSES!

The somewhat delayed Issue 1 marks the beginning of Volume 7 of the CoMSES Digest; we are fast approacing our the 7th anniversary of the Digest, and its 30th issue. Our hope is that these reach an ever-widening community, and as we move through the 2019 spring we

hope that your modeling courses, projects, and articles are on the same upward trajectory. This issue of the digest brings more news from the CoMSES Board- the results of the recent elections, the continuation of current efforts, and the new directions CoMSES will be taking going forward.

Special attention is merited for the extensive list of upcoming workshops and conferences on ABM and related fields. Summer is a busy time for these, and this summer looks especially full. Although the application deadline has passed for some of these, the picture they give is of a robust, lively, and rapidly maturing field. It also cannot be denied that the list includes some spectacular locations: Italy, Germany, Russia, the Netherlands, Ireland- it's a good time to be a modeler, indeed! For those of you who are teaching this spring semester, plant the seed of transparency and reproducbility: Encourage your students to upload their projects to the model library. We will all reap what they sow.

Best,
John T. Murphy, *CoMSES Digest Editor*

CoMSES News

Elections

The results of the Board elections are in: Moira Zellner and Forrest Stonedahl have been elected to serve 3 more years each. The current makeup of the board remains unchanged:

> Andrew Bell, Bill Rand (2017-2019)
>
> Mariam Kiran, Kimberly Rogers (2018-2020)
>
> Forrest Stonedahl, Moira Zellner (2019-2021)

Winter School

The third Winter School on Agent-Based Modeling of Social-Ecological Systems was held January 7-11, 2019 in Tempe, Arizona. Sixteen participants (graduate students, postdocs and faculty) from five continents took part in this intensive week-long training program. Students received lectures on social, ecological and social-ecological systems, were presented with detailed modeling case studies and had hands-on practice with best modeling practices. Students also worked in groups on projects applying their knowledge and skills to existing modeling projects varying from hurricane evacuations, the spread of agriculture in Neolithic Europe, and water management of contemporary Mexico City. The 4th Winter School will be held January 6-10, 2020 in Tempe, Arizona, and next Comses Digest we will provide more information on the application process.

Open Modeling Foundation

CoMSES continues to build its relationship with the Open Modeling Foundation. A proposal to the Sloan Foundation to build a set of standards for model publication has recently been submitted. In the works is an OMF European Workshop. The workshop would be hosted at IASS, with the purpose of creating the draft governance charter for the OMF with the European researchers. Additional goals include developing common standards for code, documentation, replication, reuse, and interoperability; certification program with other archives and journal partners; find new ways to incentivize adoption of these standards.

From the Board

The popularity and success of the Winter School is leading the board to investigate the possibility of creating a summer version. The most likely strategy would be complementarity: whereas the Winter School is focused around NetLogo, a hypothetical Summer School could be less platform-dependent, allowing it to appeal both to those who have taken the Winter School and a new audience as well. Such a Summer School would not be hosted by ASU; this is not only to avoid repetition, but because while Phoenix an appealing destination in January, it is, realistically, somewhat less so in July. With this in mind, CoMSES could partner with an existing summer school or use CoMSES funding to start a new one. Look for more details soon.

From the Forums

A Tutorial on Model Archiving

Why archive your model?

- https://forum.comses.net/t/why-archive-your-model/7376

Archiving your model: 1. Getting Started:

- https://forum.comses.net/t/archiving-your-model-1-getting-started/7377

Archiving your model: 2. Uploading your files:

- https://forum.comses.net/t/archiving-your-model-2-uploading-your-files/7378

Archiving your model: 3. Adding contributors:

- https://forum.comses.net/t/archiving-your-model-3-adding-contributors/7379

Archiving your model: 4. Adding metadata to your model:

- https://forum.comses.net/t/archiving-your-model-4-adding-metadata-to-your-model/7380

Archiving your model: 5. Final notes:

- https://forum.comses.net/t/archiving-your-model-5-final-notes/7381

General Forum

Complexities of Agent-Based Modeling Output Analysis (2015):

- https://forum.comses.net/t/complexities-of-agent-based-modeling-output-analysis-2015/7318

Help! ABM and AI:

- https://forum.comses.net/t/help-abm-and-ai/2033

Improving ABM Bibliography:

- https://forum.comses.net/t/improving-abm-bibliography/7497

Special issue on Simulation Models of Ethnocentrism and Diversity:

- https://forum.comses.net/t/special-issue-on-simulation-models-of-ethnocentrism-and-diversity/7525

Compare ABM and other models:

- https://forum.comses.net/t/compare-abm-with-other-models/7515

FAIR data use survey:

- https://forum.comses.net/t/fair-data-use-survey/7500

Calendar of Events

Conferences and Workshops

IC2S2 2019 – 5th International Conference on Computational Social Science
July 17-20, 2019
Amsterdam, The Netherlands
https://www.comses.net/events/506/

20th International Workshop on Multi-Agent-Based Simulation (MABS 2019)
May 13, 2019
Montreal, Canada
https://www.comses.net/events/517/

International Conference on Autonomous Agents and Multiagent Systems
May 13-17, 2019
Montreal, Canada
https://www.comses.net/events/503/

Modeling the World's Systems
May 13-15, 2019
Washington DC, USA
https://www.comses.net/events/513/

Responsible Artificial Intelligence Agents (RAIA) Workshop 2019
May 13-14, 2019
Montreal, Canada
https://www.comses.net/events/511/

Symposium on Agent-Based Modelling for Theory Building in Social Sciences
May 31 - June 02, 2019
St. Petersburg, Russia
https://www.comses.net/events/521/

Rostock Retreat on Simulation
July 1-3, 2019
Rostock, Germany
https://www.comses.net/events/507/

2019 International Conference on Social Computing, Behavioral-Cultural Modeling, & Prediction and Behavior Representation in Modeling and Simulation
July 9-12, 2019
Washington DC, USA
https://www.comses.net/events/510/

IC2S2 2019 – 5th INTERNATIONAL CONFERENCE ON COMPUTATIONAL SOCIAL SCIENCE
July 17-20, 2019
Amsterdam, The Netherlands
https://www.comses.net/events/506/

ABM and Simulation session at the INQUA 2019 conference in Dublin
July 24-30, 2019
Dublin, Ireland

https://www.comses.net/events/500/

The International Society for Ecological Modelling Global Conference 2019
October 1-5, 2019
Salzburg, Austria
https://www.comses.net/events/524/

33rd European Simulation and Modelling Conf. - ESM'2019
October 28-30, 2019
Palma de Mallorca, Spain
https://www.comses.net/events/520/

Winter Simulation 2019
December 8-11, 2019
National Harbor, Maryland
https://www.comses.net/events/519/

Courses

Complex Networks: Theory, Methods, Applications
May 13-17, 2019
Villa del Grumello, Como, Italy
https://www.comses.net/events/516/

Food Energy and Water Systems in a Global Economy Master Class
May 13-16, 2019
Flagstaff, Arizona (USA)

Computational Social Science Summer School on Migration
June 10-21, 2019
Sardinia, Italy
https://www.comses.net/events/509/

European Social Simulation Association Summer School in Social Simulation 2019
June 17-21, 2019
Aberdeen, Scotland
https://www.comses.net/events/522/

Summer school on simulation models - eX Modelo
June 23-28, 2019
France

https://www.comses.net/events/504/

Course Agent-Based Computational Modeling in Population Studies
June 24-28, 2019
Rostock, Germany
https://www.comses.net/events/508/

BEHAVE Summer School 2019 on “Agent-Based Modelling for Social Scientists”
September 2-11, 2019
Brescia, Italy
https://www.comses.net/events/525/

International Summer School on Modelling Food Security
September 8-14, 2019
Leipzig, Germany
https://www.comses.net/events/518/

Submission Opportunities

33rd European Simulation and Modelling Conf. - ESM'2019
October 28-30, 2019
Palma de Mallorca, Spain
Submission Due: April 15th, 2019
https://www.comses.net/events/520/

BEHAVE Summer School 2019 on “Agent-Based Modelling for Social Scientists”
September 2-11, 2019
Brescia, Italy
Submission Due: April 30th
https://www.comses.net/events/525/

Jobs and Appointments

Note: For some of these, the application deadline has passed; they are listed here to give a broad view of activity in the field. The most recent postings are listed first. If you are looking for a job, log on to the CoMSES forums and subscribe to receive notifications when new jobs are posted.

Postdoc on Multiagent Systems
AASS, the AI institution at Örebro University in Örebro, Sweden

- https://www.comses.net/jobs/410/

Assistant Professor in Complexity Science for Sustainable Development
University of Twente (UT)

- https://www.comses.net/jobs/409/

Research Fellow (3 years) in Simulating Urban Systems
Leeds, UK

- https://www.comses.net/jobs/408/

Post-doc position on the modelling of water consumption in tourism
Wageningen University (Netherlands)

- https://www.comses.net/jobs/407/

2 PhDs in Data-driven Agent-based Modeling of Attitude Dynamics
Jacobs University Bremen, Germany

- https://www.comses.net/jobs/406/

Post-Docs/ Research Scientists
Max Planck Institute for Demographic Research (MPIDR)

- https://www.comses.net/jobs/405/

Fully funded 3-month research opportunity for junior socio-environmental systems scientists
Leipzig, Germany

- https://www.comses.net/jobs/404/

Research scientist on modelling socio-ecological systems
Clermont-Ferrand, France

- https://www.comses.net/jobs/403/

PhD position computational sociology
University of Groningen, Department of Sociology

- https://www.comses.net/jobs/402/

Three year MRC Skills Development Fellowship- Computational Social Science
University of Glasgow

- https://www.comses.net/jobs/401/

PhD Scholarship on "Coevolution of languages and social networks"
Nanyang Technological University Singapore

- https://www.comses.net/jobs/400/

3 PhD vacancies on 'socio-hydrology in Brazil'
Wageningen University (Netherlands)

- https://www.comses.net/jobs/399/

Postdoc for analysis of food security and human migration
Columbia University

- https://www.comses.net/jobs/398/

Postdoc for Agricultural Water Management
Cranfield University UK

- https://www.comses.net/jobs/397/

PhD student on Hybrid LCA-ABM of dairy farming systems including nonlinear optimization
Luxembourg Institute of Science and Technology

- https://www.comses.net/jobs/396/

A Food-Energy-Water postdoc position
Lehigh University

- https://www.comses.net/jobs/395/

Postdoc for integrated crop modeling on climate change and food security
Leibniz Centre for Agricultural Landscape Research

- https://www.comses.net/jobs/394/

RStudio Summer 2019 Internships
Boston, Seattle, Online

- https://www.comses.net/jobs/393/

ERC postdoc developing a network theory of attitudes -- up to five years
University of Limerick

- https://www.comses.net/jobs/392/

Senior Postdoc in Complexity Economics
Institute for New Economic Thinking at the Oxford Martin School and the Mathematical Institute

- https://www.comses.net/jobs/391/

Data Scientist/Specialist for Sustainability
University of Michigan

- https://www.comses.net/jobs/390/

Fully funded 4y PhD position on Regional Economic Spatial Agent-Based Models
U. Twente, Netherlands

- https://www.comses.net/jobs/389/

Postdoctorate position in social simulation "dynamical models of how individual and group perceive each other, including individual and group self-perception"
Laboratoire d'Ingénierie pour les Systèmes Complexes (LISC) at Irstea (http://www.irstea.fr/en/accueil) Center of Clermont-Ferrand (France)

- https://www.comses.net/jobs/388/

Model Library

New Model Uploads

New uploads to the model library set a new record: 22 models were uploaded during the last quarter, breaking the previous upload record of 18 (multiple times). The models span an array of topics, from economics to disease, from water resource management to populations of foxes, and more. NetLogo reigns supreme- as usual- with 17, and Repast a distant second (2), but AnyLogic has an entry, along with latecomers Gamma and Mesa. Three models also successfully passed CoMSES Net peer review:

- Energy Landscape Transition Analysis and Planning in Egypt model by Mostafa Shaaban, et al.
- Modelling the Social Complexity of Reputation and Status Dynamics by André Grow
- Multi-host, multi-serovar Leptospira Dynamics Model by Aniruddha Belsare et al.

Bicycle model

Dana Kaziyeva, Gudrun Wallentin, Martin Loidl | Published Thu Jan 10 21:30:34 2019

The purpose of the model is to generate disaggregated traffic flow distribution of cyclists at the regional scale level. The model is fuelled by statistical and topographical data as well as by generalized assumptions derived from survey data on mobility behaviour. It results in emergent flow patterns at a high spatial and temporal level of detail.

Agent Based model exploring relationship between ethnic density and health.

Frensis Bras | Published Tue Jan 15 20:34:42 2019

The model explores the relationship between ethnic density and health. It does this through exploring the potential pathway between racism, segregation, area deprivation and income.

Challenges and benefits of model replication: an agent-based example

Jiaxin Zhang | Published Sun Jan 20 05:37:16 2019

This model is a replication model which is constructed based on the existing model used by the following article:
Brown, D.G. and Robinson, D.T., 2006. Effects of heterogeneity in residential preferences on an agent-based model of urban sprawl. Ecology and society, 11(1).
We successfully replicate that model and demonstrated the reliability and replicability of it.

The Evolution of Tribalism: A Social-Ecological Model of Cooperation and Inter-group Conflict Under Pastoralism

Nicholas Seltzer | Published Mon Jan 21 06:48:10 2019

This study investigates a possible nexus between inter-group competition and intra-group cooperation, which may be called “tribalism.” Building upon previous studies demonstrating a relationship between the environment and social relations, the present research incorporates a social-ecological model as a mediating factor connecting both individuals and communities to the environment. Cyclical and non-cyclical fluctuation in a simple, two-resource ecology drive agents to adopt either “go-it-alone” or group-based survival strategies via evolutionary selection.

For special issue submission in JASSS.

Spatial rangeland model

Marco Janssen | Published Tue Jan 22 01:51:09 2019

Spatial explicit model of a rangeland system, based on Australian conditions, where grass, woody shrubs and fire compete fore resources. Overgrazing can cause the system to flip from a healthy state to an unproductive shrub state. With the model one can explore the consequences of different movement rules of the livestock on the resilience of the system.

Tiebout sorting

Marco Janssen | Published Thu Jan 24 19:37:29 2019

This Netlogo replication of Kollman, K., J.H. Miller and S.E. Page (1997) Political Institutions and Sorting in a Tiebout Model, American Economic Review 87(5): 977-992. The model consists of of citizens who can vote for partie and move to other jurisdictions if they expect their preferences are better served. Parties adjust their positions to increase their share in the elections.

Adoption of a new regulation

Marco Janssen | Published Sat Jan 26 23:58:54 2019

A group of agents share a resource and agents will become sufficiently motivated to adopt a rule to constraint their freedom if they experience resource scarcity and developed mutual trust relationships.

MHMSLeptoDy (Multi-host, multi-serovar Leptospira Dynamics Model)

Aniruddha Belsare, Meghan Mason, Matthew Gompper, Claudia Munoz-Zanzi | Published Tue Jan 29 02:22:56 2019

Leptospirosis is a neglected, bacterial zoonosis with worldwide distribution, primarily a disease of poverty. More than 200 pathogenic serovars of Leptospira bacteria exist, and a variety of species may act as reservoirs for these serovars. Human infection is the result of direct or indirect contact with Leptospira bacteria in the urine of infected animal hosts, primarily livestock, dogs, and rodents. There is increasing evidence that dogs and dog-adapted serovar Canicola play an important role in the burden of leptospirosis in humans in marginalized urban communities. What is needed is a more thorough understanding of the transmission dynamics of Leptospira in these marginalized urban communities, specifically the relative importance of dogs and rodents in the transmission of Leptospira to humans. This understanding will be vital for identifying meaningful intervention strategies.

FoxNet

bhradsky | Published Fri Feb 1 03:55:46 2019

FoxNet is an individual-based modelling framework that can be customised to generate high-resolution red fox Vulpes vulpes population models for both northern and southern hemispheres. FoxNet predicts red fox population dynamics, including responses to control and landscape productivity. Model landscapes (up to ~15,000 km^2 and bait layouts can be generated within FoxNet or imported as GIS layers.

Socio-hydrologicalModel_version_SESMO

Andres Baeza-Castro, Luis Bojorquez, Marco Janssen, Hallie Eakin, Fidel Serrano-Candela, Paola Gomez, Yosune Miquelajauregui, Rodrigo Garcia-Herrera | Published Tue Feb 5 01:43:34 2019

We present here MEGADAPT_SESMO model. A hybrid, dynamic, spatially explicit, integrated model to simulate the vulnerability of urban coupled socio-ecological systems – in our case, the vulnerability of Mexico City to socio-hydrological risk.

Contract farming in the Mekong Delta's rice supply chain

Hung Nguyen | Published Tue Feb 5 06:06:17 2019

We study three obstacles of the expansion of contract rice farming in the Mekong Delta (MKD) region. The failure of buyers in building trust-based relationship with small-holder farmers, unattractive offered prices from the contract farming scheme, and limited rice processing capacity have constrained contractors from participating in the large-scale paddy field program. We present an agent-based model to examine the viability of contract farming in the region from the contractor perspective.

Imperfect knowledge and stable governance in democracies

Carlos Fernández-Márquez, Francisco Jose Vazquez, Luis Fernando Medina | Published Tue Feb 5 07:33:38 2019

In this paper we introduce an agent-based model of elections and government formation where voters do not have perfect knowledge about the parties' ideological position. Although voters are boundedly rational, they are forward-looking in that they try to assess the likely impact of the different parties over the resulting government. Thus, their decision rules combine sincere and strategic voting: they form preferences about the different parties but deem some of them as inadmissible and try to block them from office. We find that the most stable and durable coalition governments emerge at intermediate levels of informational ambiguity. When voters have very poor information about the parties, their votes are scattered too widely, preventing the emergence of robust majorities. But also, voters with highly precise perceptions about the parties will cluster around tiny electoral niches with a similar aggregate effect.

Gender desegregation in German high schools

Klaus G. Troitzsch | Published Tue Feb 5 10:12:23 2019

The study goes back to a model created in the 1990s which successfully tried to replicate the changes of the percentages of female teachers among the teaching staff in high schools ("Gymnasien") in the German federal state of Rheinland-Pfalz. The current version allows for additional validation and calibration of the model and is accompanied with the empirical data against which the model is tested and with an analysis program especially designed to perform the analyses in the most recent journal article.

MEGADAPT - Socio-hydrological risk model - Theoretical (no data) implementation

Andres Baeza-Castro, Luis Bojorquez, Marco Janssen, Hallie Eakin | Published Wed Feb 6 23:56:35 2019

The model simulates the decisions of residents and a water authority to respond to socio-hydrological hazards. Residents from neighborhoods are located in a landscape with topographic complexity and two problems: water scarcity in the peripheral neighborhoods at high altitude and high risk of flooding in the lowlands, at the core of the city. The role of the water authority is to decide where investments in infrastructure should be allocated to reduce the risk to water scarcity and flooding events in the city, and these decisions are made via a multi-objective site selection procedure.

Hybrid Climate Assessment Model (HCAM)

Peer-Olaf Siebers | Published Fri Feb 15 17:12:13 2019

Our Hybrid Climate Assessment Model (HCAM) aims to simulate the behaviours of individuals under the influence of climate change and external policy makings. In our proposed solution we use System Dynamics (SD) modelling to represent the physical and economic environments. Agent-Based (AB) modelling is used to represent collections of individuals that can interact with other collections of individuals and the environment. In turn, individual agents are endowed with an internal SD model to track their psychological state used for decision making. In this paper we address the feasibility of such a scalable hybrid approach as a proof-of-concept. This novel approach allows us to reuse existing rigid, but well-established Integrated Assessment Models (IAMs), and adds more flexibility by replacing aggregate stocks with a community of vibrant interacting entities.

Drafting agent-based modeling into basketball analytics

Matthew Oldham | Published Tue Feb 19 17:35:04 2019

An agent-based simulation of a game of basketball. The model implements most components of a standard game of basketball. Additionally, the model allows the user to test for the effect of two separate cognitive biases – the hot-hand effect and a belief in the team's franchise player.

Toy Trader 2019

Timothy Gooding | Published Sun Feb 24 08:53:18 2019

A model that strips trade down to its core to explore foundational emergent behaviour and evolution in trade systems.

Three-Goods Trader 2019

Timothy Gooding | Published Sun Feb 24 09:55:56 2019

This is the Toy Trader but with two additional goods being traded.

Double Auction

Timothy Gooding | Published Sun Feb 24 10:01:44 2019

This model reproduces the double auction experiments and explores the difference between short-term and long-term trading and pricing.

Metaphoria 2019

Timothy Gooding | Published Sun Feb 24 10:09:04 2019

This model test the efficiency of the market economy in comparison with a hunter/gatherer economy. It also compares the model outcomes between a market economy when using eternal agents with one using mortal agents.

RobbyGA modified 2019

Timothy Gooding | Published Sun Feb 24 10:29:32 2019

This is a modification of the RobbyGA model by the Santa Fe Institute (see model Info tab for full information). The basic idea is that the GA has been changed to one where the agents have a set lifetime, anyone can reproduce with anyone, but where there is a user-set amount of ‘starvation’ that kills the agents that have a too low fitness.

Metaphoria 2019 eternal mutation

Timothy Gooding | Published Sun Feb 24 11:18:48 2019

This model is a modification of Metaphoria 2019, where the monetary system can be run with agents that do not die, but their characteristics are mutated as they are in the mortal population.

Metaphoria 2019 eternal fitness test

Timothy Gooding | Published Sun Feb 24 11:23:58 2019

This is a modification of Metaphoria 2019 so that the eternal population is subjected to all the evolutionary forces as the mortal population.

FNNR-ABM

Judy Mak | Published Thu Feb 28 04:26:47 2019

FNNR-ABM is an agent-based model that simulates human activity, Guizhou snub-nosed monkey movement, and GTGP-enrolled land parcel conversion in the Fanjingshan National Nature Reserve in Guizhou, China.

From Individual Fuzzy Cognitive Maps to Agent Based Models: Modeling Multi-Factorial and Multi-stakeholder Decision-Making for Water Scarcity

Sara Mehryar | Published Mon Mar 4 22:46:35 2019

This model simulates different farmers’ decisions and actions to adapt to the water scarce situation. This simulation helps to investigate how farmers’ strategies may impact on macro-

behavior of the social-ecological system i.e. overall groundwater use change and emigration of farmers. The environmental variables' behavior and behavioral rules of stakeholders are captured with Fuzzy Cognitive Map (FCM) that is developed with both qualitative and quantitative data, i.e. stakeholders' knowledge and empirical data from studies.

Applying Brantingham's Neutral Model of Stone Raw Material Procurement to the Pinnacle Point Middle Stone Age Record, Western Cape, South Africa

Simen Oestmo, Marco Janssen, Haley Cawthra | Published Sun Mar 10 19:19:12 2019

This model is an application of Brantingham's neutral model to a real landscape with real locations of potential sources. The sources are represented as their sizes during current conditions, and from marine geophysics surveys, and the agent starts at a random location in Mossel Bay Region (MBR) surrounding the Archaeological Pinnacle Point (PP) locality, Western Cape, South Africa. The agent moves at random on the landscape, picks up and discards raw materials based only upon space in toolkit and probability of discard. If the agent happens to encounter the PP locality while moving at random the agent may discard raw materials at it based on the discard probability.

Most Downloaded Models

Two previous top-five models (Al-Irsyad ARISE and Rebaudo SimAdapt) are joined in the top downloads by three newcomers covering transportation, cooperation, and forest fire simulations. The top five most-downloaded models combined for a total of 392 downloads, out of a grand total of 8858 downloads for the quarter.

1. **(99 Downloads)** Increased costs of cooperation help cooperators in the long run by Paul Smaldino
2. **(67 Downloads)** Transport simulation in a real road network by Jiaqi Ge
3. **(67 Downloads)** BorealFireSIM Model by Liliana Perez
4. **(57 Downloads)** Agent-based Renewables model for Integrated Sustainable Energy (ARISE) by Muhammad Indra Al Irsyad
5. **(56 Downloads)** SimAdapt by François Rebaud

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