Call for Papers

Rethinking the ABCs: Agent-Based Models and Complexity Science in the age of Big Data (full-day workshop) on August 28, 2018 as part of **GIScience 2018,** *Melbourne, Australia*

Website: https://ledgeumontreal.org/bigcomplexitygisci2018
Papers due: May 1st, 2018
Organizers: Raja Sengupta (McGill University) & Liliana Perez (Université de Montréal);

Committee Members:
David Bennett, Department of Geography, University of Iowa
Christopher Bone, Department of Geography, University of Victoria, USA;
Andrew Crooks, Computational Social Science, George Mason University, USA
Suzana Dragicevic, Simon Fraser University, Canada;
Bin Jiang, Department of Technology and Built Environment, University of Gävle, Sweden;
Yan Liu, Institute for Social Science Research, University of Queensland, Australia;
Mir-Abolfazl Mostafavi, Universite Laval, Canada;
Atsushi Nara, Department of Geography, San Diego State University, USA;
Hazel Parry, Commonwealth Scientific and Industrial Research Organisation - CSIRO, Australia
Jason Thompson, Melbourne School of Design, the University of Melbourne, Australia
Gundrun Wallentin, Department of Geoinformatics, University of Salzburg, Austria

Timeline:
Papers due: May 1, 2018
Reviews & acceptances returned: June 1, 2018
Revised final papers submission: July 1, 2018
Conference: Aug 28, 2018

"Geospatial Big Data" is a ubiquitous and a growing part of GIScience (Perez et al., 2017), and alongwith the availability of Cloud Computing platforms and Sensor Networks, is radically altering the computational platforms and data environments within which simulation models are executed. This increasing availability of large, dynamic data sets creates tremendous opportunities and challenges for empirical science (Frankel and Reid, 2008; Miller, 2008). As an editorial in *Nature* pointed out, "Big Data" is relevant simply not because it is big, but it is also complex. And most of this data is spatial. McAffee's (2012) much cited article on Big Data for Businesses published in the *Harvard Business Review* has as an initial illustration a map of Denver, and provides ample spatial examples (e.g., GPS data) while discussing the (hitherto) three Vs of Big Data (Volume, Velocity and Variety).   Analysis and use of such data is beyond the comprehension of most individuals using traditional tools. New and innovative methods are required to usefully utilize the torrent of information available to scientists today.   Further, there is also a need for an improved understanding of the complexity of spatial phenomena captured by them. This creates new opportunities and challenges.

We invite papers for presentation at a workshop on methodological approaches, such agent-based modeling, cellular automata, game theory, and network theory, amongst others, in the context of Big Data, linked to GIScience 2018, which will focus on and elucidate these linkages. This workshop will discuss emerging Complexity Science and Agent-Based methods that push boundaries of established tools for a new way of understanding and utilizing Big Data within GIScience. The topics could include:

1. Multisensor Data Fusion for parameterizing complex models
   a. Handling the 4Vs (Volume, Velocity, Variety and Veracity)
   b. Multi-scale interactions in geographic complex phenomena
   c. Semantic interoperability
2. Integrating theory with practice:
   a. Big data analytics integrated with complexity theories
   b. Spatiotemporal analysis in complexity theories
   c. Dynamic geo-social network analysis
   d. Observer-Expectancy effect of real-time simulations
   e. Scaling relations (power laws) in geography
   f. Game theoretic approach to geographic problems
3. Output Validation:
   a. Can modeled pattern or process outputs be validated with real-time data?
   b. How can complex models output be visualized and communicated?
   c. How can increased use of massive sensitivity analyses improve process validation?
   d. Observer-Expectancy effect of real-time models' simulations

We will have 5 minute lightning talks by chairs and committee members, followed by 20 minute presentations by selected speakers, and ending with a 10-minute panel discussion.

Submitted papers are welcome by email: BigComplexityGISci@gmail.com. Please include the words "Big Complexity @ GIScience" in your subject line and attach the paper (formatted in LNCS style, 5000 words including all references and 4 figures maximum) will be peer-reviewed by the program committee. Papers will not only be evaluated on scientific quality but also on "visionary approaches". Experimental approaches and thought experiments are therefore welcomed. Accepted papers will be published in the workshop proceedings and hosted online, and possibly submitted for publication as a special issue of a journal or edited volume. At least one author of accepted papers will be required to present their research at the workshop. *To participate in this workshop please submit paper by **May 1st, 2018**. Notification of acceptance will be emailed by **June 1st, 2018**.*

One or more authors of accepted papers must register for the workshop (***No registration needed for the full conference***)