Call for Papers (Full and Short 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

Full Papers (5000 words) due: ~~May 1st, 2018~~ **May 15th, 2018 (Extended)**

Short Papers (1500 words) due: June 22nd, 2018

Organizers: Raja Sengupta (McGill University) & Liliana Perez (Université de Montréal);

Committee Members:

Clio Andris, Department of Geography, Pennsylvania State University, USA
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Timeline:

Full Papers
(5000 words; will be published in a Journal special issue)
Due: ~~**May 1st, 2018**~~ **May 15th, 2018 (Extended)**
Reviews & acceptances returned: ~~June 1, 2018~~ **June 21st, 2018 (Extended)**
Revised final papers submission: ~~July 1, 2018~~ **July 30th, 2018 (Extended)**
Short Papers
(1500 words; will be published in workshop proceedings online and as part of GIScience proceedings)
Due: **June 22nd, 2018**
Reviews & acceptances returned: **July 12th, 2018**

Conference: **Aug 28-31, 2018 (workshop held on Aug 28th, 2018).**

"Geospatial Big Data" is a ubiquitous and a growing part of GIScience (Perez et al., 2017), and along with 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

Frankel, F. and Reid, R., 2008. Big data: Distilling meaning from data. *Nature*, **455**(7209), pp.30-30.
McAfee, A., Brynjolfsson, E. and Davenport, T., 2012. Big data: the management revolution. Harvard *Business Review*, **90**(10), pp.60-68.
Miller, E., 2008. Community cleverness required. *Nature*, **455**, p.1.
Perez L., L., Kim, E.-K., & Sengupta, R. (Eds.). (2018). *Agent-Based Models and Complexity Science in the Age of Geospatial Big Data*. Cham: Springer International Publishing (110 p.)

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 (***Full Papers***: formatted in LNCS style, **5000 words** including all references and 4 figures maximum; ***Short Papers***: formatted in LNCS style, **1500 words** including all references and **2 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 your Full Paper by* ***~~May 1st, 2018~~ May15th, 2018 (Extended)****, and your Short Paper by* ***June 22nd, 2018****. Notification of acceptance for the full papers will be emailed by* ***~~June 1st, 2018~~ June 21st, 2018 (Extended),*** *and for the short papers by* ***July 12th, 2018****.*

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