

A Special Issue on **Cyberinfrastructure and Data-Driven Geography** with *Computer, Environment and Urban Systems*

The scientific community has entered the era of big data. This is no exception for the field of Geography, where we are experiencing a paradigm shift from application-driven geography to data-driven geography. Vast quantities of geospatial information have been acquired at Very fast speeds and Very high spatial, temporal and/or spatiotemporal resolutions from a Variety of earth observation platforms. These four V's match up with the typical characteristics of "Big Data" in its volume, velocity, veracity and variety. Due to its complexity, the widespread availability of big data poses significant computational challenges for scientists within and beyond geospatial domains, especially with regard to efficient discovery, management, analysis and visualization. Emerging cyberinfrastructure techniques, which enable high performance computing (Wang, 2010; Yang, 2011), intelligent data discovery (Li et al. 2010, 2014), multi-dimensional geovisualization (MacEachren et al. 2001, 2014), and collaborative decision making environments (through the implementation of virtual organizations), offer new opportunities to tackle data- and computational- intensive geospatial problems.

This special issue aims to capture the most recent advancement in this direction and to develop an initial research agenda in the domain. We are seeking original unpublished papers that describe recent advances and efforts in exploiting cyberinfrastructure solutions for data-intensive geospatial applications. Note that submissions containing a novel cyberinfrastructure portal solution and new data-driven geospatial techniques that contribute to both the theoretical and technical corpus are most preferred. We are especially interested in applications to cities, urban regions and other human settlements (Batty et al. 2012), where the human or socio-economic element plays a significant role, which is the focus of the CEUS journal. Applications featuring coupled human and natural systems are also welcome.

Topics include (but are not limited to):

- Vision of cyberinfrastructure and/or data-driven geography
- New methods, techniques to enable the effective discovery of distributed geospatial data
- Ontologies and semantics research for data-driven geography
- New computing architecture (e.g. high performance computing, cloud computing, GPGPU computing) for data-intensive geospatial applications
- New techniques for cyber-geovisualization
- Spatial decision (planning) support with cyberinfrastructure
- Spatiotemporal modeling and analysis of geographical data
- Applications in urban and environmental science, and other science domains.

About the Journal:

CEUS is a SCI journal with a five-year impact factor of 2.249. *Computers, Environment and Urban Systems* is an interdisciplinary journal publishing cutting-edge and innovative computer-based research on urban systems, systems of cities, and built and natural environments, that privileges the geospatial perspective. The journal provides a stimulating presentation of perspectives, research developments, overviews of important new technologies and uses of major computational, information-based, and visualization innovations. Applied and theoretical contributions demonstrate the scope of computer-based analysis fostering a better understanding of urban systems, the synergistic relationships between built and natural environments, their spatial scope and their dynamics. Application areas include infrastructure and facilities management, physical planning and urban design, land use and transportation, business and

service planning, coupled human and natural systems, urban planning, socio-economic development, emergency response and hazards, and land and resource management. Examples of methodological approaches include decision support systems, geocomputation, spatial statistical analysis, complex systems and artificial intelligence, visual analytics and geovisualization, ubiquitous computing, and space-time simulation. Contributions emphasizing the development and enhancement of computer-based technologies for the analysis and modeling, policy formulation, planning, and management of environmental and urban systems that enhance sustainable futures are especially sought. The journal also encourages research on the modalities through which information and other computer-based technologies mold environmental and urban systems.

Important dates:

- August 1, 2015, abstract submission to guest editors
- August 15, 2015, full paper submission invited
- December 1, 2015, full paper submission to CEUS online submission system
- June 1, 2016, paper acceptance notification
- early 2017, special issue published

Guest Editors:

Wenwen Li, GeoDa Center for Geospatial Analysis and Computation, School of Geographical Sciences and Urban Planning, Arizona State University, US Email: Wenwen@asu.edu

Zhangbing Zhou, School of Information Engineering, China University of Geosciences (Beijing), China, Email: zhangbing.zhou@gmail.com

Michael Batty, Centre for Advanced Spatial Analysis (CASA), University College London, UK, Email: m.batty@ucl.ac.uk

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