Paper Session:

1212 Spatiotemporal Thinking, Computing and Applications 2: Methods

is scheduled on Tuesday, 4/8/2014, from 10:00 AM - 11:40 AM in Room 12, TCC, First Floor

Sponsorship(s):
Spatial Analysis and Modeling Specialty Group
Cyberinfrastructure Specialty Group
Geographic Information Science and Systems Specialty Group

Organizer(s):
Chaowei Yang - George Mason University
Diansheng Guo - UNIVERSITY OF SOUTH CAROLINA
Keith C. Clarke - University Of California, Santa Barbara

Chair(s):
Weihe Wendy Guan - Harvard University

Abstract(s):

10:00 AM Author(s): *Andrew J. Hardin - University of Colorado at Boulder-Geography
Seth E. Spielman - University of Colorado at Boulder- Geography

Abstract Title: *A Typology and Numerical Methodology for Studying the Spatio-temporal Process of Diffusion*

10:20 AM Author(s): *James Haworth - University College London

Abstract Title: *Machine learning approaches for predictive policing*

10:40 AM Author(s): *Yue Sun - Clark University
Jie Tian - Assistant Professor of Geographic Information Science for Development and Environment

Abstract Title: *Mapping Ambient Temperature based on Mobile Data*

11:00 AM Author(s): *Min Xu - Department of Geography,University of Cincinnati, Cincinnati, USA
Hongxing Liu - Department of Geography,University of Cincinnati, Cincinnati, USA
Bailang Yu - Key Lab of Geographic Information Science, Ministry of Education, East China Normal University, Shanghai, China
Emily Kang - Department of Mathematical Sciences,University of Cincinnati, Cincinnati, USA

Abstract Title: *A Markov Random Field Approach to Improving Classification of Remotely Sensed Image by Incorporating Spatial and Temporal Contexts*

Session Description: Many 21st century challenges, such as climate change, natural disaster and interdisciplinary discovery, exist within a 4-dimensional (3D space and 1D time) framework. Integrating our understanding and methods across all four dimensions would lead to new approaches to help us address the challenges by providing: 1) new methodologies to improve our knowledge; 2) new computational tools and software to advance relevant technologies; and 3) applications to directly address the challenges.

For example, how could we save thousands more lives if an earthquake hits a densely populated area or a huge volcano erupted near a major city? A spatiotemporally aware and optimized approach could help advance GIScience, Cyberinfrastructure, Cloud Computing, Big Data, Social Media, Digital Earth and future generations of GIS and geographic solutions. A better understanding of the spatiotemporal linkage among different domains of geography would enable us to
address problems that were previously unsolvable. The NSF Spatiotemporal Innovation Center is established to collectively investigate just such solutions.

Following the success of last year's spatiotemporal thinking, computing and application sessions, we are organizing a series of sessions (paper, illustrative, interactive, and panel) on STCA to move the discussion forward and to build a research agenda. Possible topics include but are not limited to:

1. Are there undiscovered spatiotemporal principles or laws?
2. How to detect spatiotemporal patterns from observation and simulations?
3. How to analyze spatiotemporal patterns in various geographic sciences, such as climate change, ocean science, environmental science, disaster and sustainability studies.
4. How to formulate and/or utilize spatiotemporal thinking as a methodology and conceptualization process in geographic science discovery and application.
5. What are the new computing, software, and application products to address spatiotemporal problems?
6. How can spatiotemporal thinking and computing be used to manage and develop cloud computing and Big Data solutions?
7. Does a spatiotemporal approach facilitate better understanding of the physical and social sciences, such as climate change, energy, political, and population sciences?
8. How to educate the next generation workforce with spatiotemporal knowledge and methods?
9. How best to communicate spatiotemporal knowledge.

Organizers
- Peter Bol, Harvard University
- Keith Clarke, University of California at Santa Barbara
- Jeff Dozier, University of California at Santa Barbara
- Michael Goodchild, University of California at Santa Barbara/ESRI
- Wendy Guan, Harvard University
- Diansheng Guo, Univ. of Southern Carolina
- Paul Houser, George Mason University
- Qunying Huang, Univ. of Wisconsin-Madison
- Shaowen Wang, Univ. of Illinois at Urbana-Champagne
- Chaowei Yang, George Mason University
- Axing Zhu, Univ. of Wisconsin-Madison

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