

UCGIS Research Committee Report, June 2019 – May 2020: @UCGIS Annual Symposium 2020

This report covers the activities of the Research Committee for the period of June 2019 (UCGIS Symposium in Washington, DC) to the 2020 UCGIS Symposium (online).

UCGIS Research Committee Members, June 2019 – May 2020:

Shih-Lung Shaw at University of Tennessee, Knoxville is completing his third year as chair of the UCGIS Research Committee. The current committee consists of Jeremy Mennis at Temple University (Past Chair), Wenwen Li at Arizona State University (Vice Chair), Jochen Albrecht at Hunter College - The City University of New York, Jennifer Bernstein at University of Southern California, Yingjie Hu at University at Buffalo, Yongmei Lu at Texas State University - San Marcos, Wei Luo at Harvard University, Ross Meentemeyer at North Carolina State University, Daoqin Tong at Arizona State University, Ming-Hsiang Tsou at San Diego State University, Lynn Usery at U.S. Geological Survey, Chen Xu at University of Wyoming, Enki Yoo at University at Buffalo, Zhe Zhang at Texas A&M University, and Lei Zou at Texas A&M University

Major activities of this reporting period include the following:

1. 2020 UCGIS Research Award

The Research Award Committee for 2020 was comprised of the committee chair, Daniel Griffith (University of Texas at Dallas), and committee members Jochen Albrecht (Hunter College), Kathleen Stewart (University of Maryland), Xiaobai Yao (University of Georgia), and Enki Yoo (University of Buffalo). The committee selected Dr. Helena Mitasova, Professor in the Department of Marine, Earth and Atmospheric Sciences, and Associate Director for Geovisualization at the Center for Geospatial Analytics, at North Carolina State University (NCSU), to receive 2020 UCGIS Research Award for her groundbreaking work in the methodological and theoretical developments of open source geospatial software. With her specific expertise in both geomorphology and open source GIS, Dr. Mitasova has made fundamental and innovative contributions to 3-dimensional and spatio-temporal dynamics, such as development of open source software modules for spatial interpolation, topographic analysis, water flow simulations, and erosion modeling.

2. Revised the Guidelines for UCGIS Research Committee and Invited New Members

UCGIS Research Committee worked with Diana Sinton, UCGIS Executive Director, to strengthen and reinforce the UCGIS research committee structure. A copy of the revised guidelines is available at the UCGIS website (<https://www.ucgis.org/research-committee>). We also encouraged and invited new members to join the research committee and propose new research initiatives.

3. Participated in “Geospatial Humanities” Efforts

UCGIS Research Committee worked with Alberto Giordano (UCGIS Past-President) and Diana Sinton (UCGIS Executive Director) to organize panel sessions at 2019 UCGIS Symposium related to the theme of The Geospatial Humanities: Transdisciplinary Opportunities for the GIScience

Community. A special issue on The Geospatial Humanities: Transdisciplinary Opportunities was published in February 2020 by the International Journal of Humanities and Arts Computing (<https://www.eupublishing.com/toc/ijhac/14/1-2>).

4. Developed Three Ongoing Research Initiatives

UCGIS Research Committee members proposed three research initiatives to promote important and timely research topics. Three working groups have been formed among the research committee members to pursue these research initiatives. These three research initiatives are:

1) Initiative 1: CyberGIS and Decision Support Systems (<https://www.ucgis.org/initiative-on-cybergis-and-decision-support-systems>)

This research initiative aims to advance geospatial decision science using emerging technologies and transform the research outcomes into high-performance geospatial-inspired software products. The initiative will focus on developing novel decision-making techniques and open software tools using emerging technologies and methods. Major activities of this initiative include:

- This initiative organized a virtual session at 2000 Annual Meeting of the American Association of Geographers (AAG) - Symposium on Frontiers in CyberGIS and Geospatial Data Science: University Consortium for Geographic Information Science (UCGIS) - CyberGIS and Decision Support Systems (<https://aag.secure-abstracts.com/AAG%20Annual%20Meeting%202020/sessions-gallery/26039>).
- This initiative is working on a special issue on Cyberinfrastructure and Intelligent Spatial Decision Support Systems to be published by Transactions in GIS (<https://onlinelibrary.wiley.com/journal/14679671>).

2) Initiative 2: Developing Open and Reusable GeoAI Tools (<https://www.ucgis.org/initiative-on-developing-geoai-tools>)

This research initiative aims to encourage the development and sharing of open and reusable GeoAI tools. The ultimate goal is to contribute to both GIScience research and education by facilitating the sharing and reusing of GeoAI models and tools. Major activities of this initiative include:

- This initiative initially organized a GeoAI symposium at 2020 AAG Annual Meeting with a total of 13 sessions that covered topics such as image processing, mapping, geo-text analysis, trajectory modeling, disaster response, and public health. Due to the COVID-19 that changed 2020 AAG Annual Meeting to a virtual conference, some sessions were cancelled and three sessions continued as virtual sessions.
- This initiative is working on a special issue on Geospatial Artificial Intelligence to be published by Geoinformatica, which is a joint effort of this UCGIS research initiative and ACM SIGSPATIAL 2020 (<https://www.springer.com/journal/10707/updates/17573556>).

3) Initiative 3: Convergence Research of GIScience, Humanities, and Social Sciences (<https://www.ucgis.org/initiative-on-convergence-research>)

This research initiative aims at encouraging and supporting a dialogue across disciplinary boundaries of GIScience, humanities, and social sciences. It intends to identify the key challenges and opportunities of conducting such convergence research and explore

innovative and creative ways of bringing human dimensions and human perspectives into GIScience. Major activities of this initiatives include:

- This initiative organized several paper and panel sessions at 2020 AAG Annual Meeting that were cancelled due to the change of 2020 AAG Annual Meeting to a virtual format.
- This initiative also organized a workshop of Spatiotemporal Big Data Analytics for Human Dynamics Research and a panel session at UCGIS 2020 Symposium in Hawaii, which were cancelled due to some challenges of running the workshop online and a need of consolidating the sessions organized by the three research initiatives.
- This initiative has developed an online questionnaire survey, which received an IRB approval in March 2020, to identify major research questions, challenges, and opportunities of developing convergence research of GIScience, humanities, and social sciences. This survey is tentatively postponed due to the COVID-19 situation.

5. Virtual Sessions at UCGIS 2020 Symposium (<https://www.ucgis.org/symposium-schedule-2020>)

UCGIS Research Committee has organized the following virtual sessions at UCGIS 2020 Symposium:

- 1) UCGIS Research Committee Meeting Session at 11 am – 12 pm (EDT), June 1, 2020.
- 2) UCGIS Research Committee Initiatives: Cyberinfrastructure-Decision Support Systems, GeoAI, and Convergence Research Session at 1:00 – 2:30 pm (EDT), June 1, 2020. This session will consist of the following presentations:
 - Dr. Yingjie Hu: NeuroTPR: A Neuro-net ToPonym Recognition Model for Extracting Locations from Social Media Messages
 - Dr. Zhe Zhang: CyberGIS Enabled Decision Support Systems for Disaster Management
 - Dr. Lei Zou: The Changing Roles of Social Media in Disaster Management
 - Dr. Chen Xu: Convergence Research of GIScience, Humanities, and the Social Sciences
- 3) GIScience and COVID-19 Panel Session at 3:00 – 4:30 pm on June 1, 2020. This panel session consists of the following panelists:
 - Manish Parashar, Distinguished Professor of Computer Science at Rutgers, The State University of New Jersey University, and Office Director of the Office of Advanced Cyberinfrastructure (OAC) at the US National Science Foundation (NSF)
 - Patricia Solis, Associate Research Professor of Geography in the School of Geographical Sciences and Urban Planning and Executive Director of the Knowledge Exchange for Resilience at Arizona State University, and Co-Founder and Director of YouthMappers
 - Michael Emch, W.R. Kenan, Jr. Distinguished Professor of Geography and Epidemiology, and Fellow at the Carolina Population Center at the University of North Carolina at Chapel Hill
 - Kathleen Stewart, Professor in the Department of Geographical Sciences and Director of the Center for Geospatial Information Science at the University of Maryland
 - Shaowen Wang, Professor and Head of the Department of Geography and Geographic Information Science; Richard and Margaret Romano Professorial Scholar; and an Affiliate Professor of the Department of Computer Science, Department of Urban and

Regional Planning, and School of Information Sciences at the University of Illinois at
Urbana-Champaign (UIUC)

Respectfully submitted,
Shih-Lung Shaw
Chair, UCGIS Research Committee
May 23, 2020