

# Eric Shook

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## Education

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BS	University of Northern Iowa, Computer Science	2005
MS	University of Illinois at Urbana-Champaign, Geography	2010
PhD	University of Illinois at Urbana-Champaign, Geography	2013

Dissertation: A Computational Approach to Understanding Spatial and Temporal Granularities in Agent-Based Modeling  
Advisor: Dr. Shaowen Wang

## Academic Appointments

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- 2016 - **Assistant Professor**  
Department of Geography, Environment and Society, University of Minnesota  
IonE Associate, Institute on the Environment (IonE)  
MPC Member, Minnesota Population Center (MPC)
- 2013 - 2016 **Assistant Professor**  
Department of Geography, Kent State University  
Director, High-Performance Computing and GIS (HPCGIS) Laboratory  
Faculty Affiliate, Center for Ecology & Natural Resource Sustainability

## Refereed Journal Articles

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- 2019 Runck, B.C., Manson, S.M. **Shook, E.**, Gini, M., and Jordan, N.R. (2019). Using word embeddings to generate data-driven human agent decision-making from natural language. Available online, *GeoInformatica*, DOI: 10.1007/s10707-019-00345-2.
- 2019 **Shook, E.**, Curtis, A., Curtis, J.W., Gibson, G., Vander horst, A., Little, V., and Woolverton, C. (2019). Assessing the Geographic Context of Risk Perception and Behavioral Response to Potential Ebola Exposure. *International Journal of Environmental Research and Public Health*, 16(5):831, DOI: 10.3390/ijerph16050831.
- 2018 **Shook, E.**, Bowlick, F., Kemp, K., Ahlqvist, O., Carbajales, P., DiBiase, D., Kim, E-K., Lathrop, S., Ricker, B., Rickles, P., Rush, J., Swift, J., and Wang, S. (2018). Cyber Literacy for GIScience: Toward Formalizing Geospatial Computing Education. *The Professional Geographer*, 71:2, 221-238, DOI: 10.1080/00330124.2018.1518720.
- 2017 Haynes, D., Manson, S., and **Shook, E.** (2017). Terra Populus' architecture for integrated big geospatial services. *Transactions in GIS*, 21:546-559 DOI: 10.1111/tgis.12286.
- 2016 **Shook, E.** Hodgson, M.E., Wang, S., Behzad, B., Soltani, K., Hiscox, A., and Ajayakumar, J. (2016). Parallel Cartographic Modeling: A Methodology for Parallelizing Spatial Data Processing. *International Journal of Geographical Information Science*, 30(12):2355-2376. DOI: 10.1080/13658816.2016.1172714.

- 2016 Musigdilok, V.V., Demeter, N.E., Burke, R.V., **Shook, E.**, Ajayakumar, J., Berg, B.M., Hawkins, M.D., Ferree, J., MacAloney, B.W., Chung, S., Pellegrino, J.L., Tolli, D., Hansen, G., Upperman, J.S. (2016). Assessing American Red Cross First Aid Mobile App User Trends: Implications for Resilience. *American Journal of Disaster Medicine* 10(4):273-283. DOI:10.5055/ajdm.2015.0209.
- 2016 Curtis, A., Curtis, J.W., Porter, L.C., Jefferis, E., and **Shook, E.** (2016). Context and Spatial Nuance Inside a Neighborhood's Drug Hotspot: Implications for the Crime-Health Nexus. *Annals of the American Association of Geographers*, 106(4):819-836. DOI: 10.1080/24694452.2016.1164582.
- 2016 **Shook, E.** and Turner, V.K. (2016). The Socio-Environmental Data Explorer (SEDE): A Social Media Enhanced Decision Support System to Explore Risk Perception to Hazard Events. *Cartography and Geographic Information Science (CaGIS) Special Issue on "Integrating Big Social Data, Computing, and Modeling for a Synthesized Spatial Social Science"*, 43(5):427-441.
- 2015 McGrath, J.M., Betzelberger, A.M., Wang, S., **Shook, E.**, Zhu, X., Long, S.P., and Ainsworth, E. (2015). An analysis of ozone damage to historical maize and soybean yields in the United States. *Proceedings of the National Academy of Sciences*, 112(46):14390-5. DOI:10.1073/pnas.1509777112.
- 2015 Curtis, A., Curtis, J.W., **Shook, E.**, Smith, S., Jefferis, E., Porter, L., Schuch, L., Felix, C., and Kerndt, P.R. (2015). Spatial video geonarratives and health: case studies in post-disaster recovery, crime, mosquito control and tuberculosis in the homeless. *International Journal of Health Geographics* 14:22. DOI:10.1186/s12942-015-0014-8.
- 2015 **Shook, E.** and Wang, S. (2015). Investigating the Influence of Spatial and Temporal Granularities on Agent-Based Modeling. *Geographical Analysis*, 47(4):321-348, DOI: 10.1111/gean.12080.
- 2013 **Shook, E.**, Wang, S., and Tang, W. (2013). A Communication-aware Framework for Parallel Spatially Explicit Agent-based Models. *International Journal of Geographical Information Science*, 27(11): 2160-2181.
- 2013 Leetaru, K., Wang, S., Cao, G., Padmanabhan, A., **Shook, E.** (2013). Mapping the Global Twitter Heartbeat: The Geography of Twitter. *First Monday*, 18(5), DOI:10.5210/fm.v18i5.4366.

### Refereed Book Chapters and Encyclopedia Entries

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- 2019 **Shook, E.** (2019). GIS and Parallel Programming. In *The Geographic Information Science & Technology Body of Knowledge* (1st Quarter 2019 Edition), John P. Wilson (Ed.). DOI: 10.22224/gistbok/2019.1.1.
- 2019 Finn, M.P., Liu, Y., Mattli, D.M., Behzad, B., Yamamoto, K.H., Guan, Q., **Shook, E.**, Padmanabhan, A., Stramel, M., and Wang, S. (2019). High-Performance Small-Scale Raster Map Projection Empowered by Cyberinfrastructure. In: *CyberGIS: Fostering Geospatial Innovation and Discovery* edited by Wang, S. and Goodchild, M.F., Springer, Dordrecht, Netherlands, 171-188, DOI: 10.1007/978-94-024-1531-5\_9.
- 2017 **Shook, E.** (2017). CyberGIS. **Invited entry** In: *Oxford Bibliographies in Geography*. Ed. Barney Warf. New York: Oxford University Press, DOI: 10.1093/OBO/9780199874002-0177.

- 2016 **Shook, E.** (2016). High-performance agent-based geo-spatial modeling and simulation. **Invited topic entry** In: *Encyclopedia of GIS* edited by Shekhar, S. and Xiong, H., Springer, pp 1-9, DOI:10.1007/978-3-319-23519-6\_1572-1.
- 2016 **Shook, E.** (2016). MPI in GIS. **Invited topic entry** In: *Encyclopedia of GIS* edited by Shekhar, S. and Xiong, H., Springer, pp 1-7, DOI:10.1007/978-3-319-23519-6\_1605-1.
- 2016 **Shook, E.** (2016). Parallel Cartographic Modeling. *Advancing Geographic Information Science: The Past and Next Twenty Years* Eds. H. Onsrud and W. Kuhn, GSDI Association Press, 319–324.
- 2009 Padmanabhan, A., **Shook, E.**, Liu, Y., and Wang, S. (2009). An Interoperable Information Service Solution for Grids. In: *Cyberinfrastructure Technologies and Applications* edited by Cao, J., Nova Science Publishers, Inc..

### Refereed Conference Proceedings

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- 2018 **Shook, E.**, Del Vento, D., Zonca, A. and Wang, J. (2018). GISandbox: A Science Gateway for Geospatial Computing. In: *PEARC 18: Practice and Experience in Advanced Research Computing 2018*, 220(466), 4:1–44:7. DOI: 10.1145/3219104.3219150.
- 2017 Ajayakumar, J., **Shook, E.**, and Turner, V. (2017). Normalization Strategies for Enhancing Spatio-Temporal Analysis of Social Media Responses during Extreme Events: A Case Study based on Analysis of Four Extreme Events using Socio-Environmental Data Explorer (SEDE). *ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, Volume IV-4/W2. DOI: 10.5194/isprs-annals-IV-4-W2-139-2017, **(Awarded Honorable Mention in Best Paper Award Competition)** at the *International Symposium on Spatiotemporal Computing*, Harvard University, Boston, MA, August 7-9, 2017.
- 2015 **Shook, E.**, Wren, C., Marean, C.W., Potts, A.J., Franklin, J., Engelbrecht, F., O’Neal, D., Janssen, M., Fisher, E., Hill, K., Esler, K.J., Cowling, R.M., Scheiter, S., and Moncrieff, G. (2015). Paleoscape Model of Coastal South Africa During Modern Human Origins: Progress in Scaling and Coupling Climate, Vegetation, and Agent-based Models on XSEDE. **(Awarded Best Paper in Accelerating Discovery track)** In: *Proceedings of the Conference on Extreme Science and Engineering Discovery Environment: XSEDE’15*, 2:1-2:8. DOI: 10.1145/2792745.2792747.
- 2012 **Shook, E.**, Leetaru, K., Cao, G., Padmanabhan, A., and Wang, S. (2012). Happy or Not: Generating Topic-based Emotional Heatmaps for Culturomics using CyberGIS. In: *Proceedings of IEEE 8th International Conference on E-Science (e-Science)*, pp. 1-6.
- 2011 **Shook, E.**, and Wang, S. (2011). A Parallel Input-Output System for Resolving Spatial Data Challenges: an Agent-Based Model Case Study. In: *Proceedings of the ACM SIGSPATIAL Second International Workshop on High Performance and Distributed Geographic Information Systems*, pp. 18-25.
- 2007 **Shook, E.**, Wang, S., Briggs R., Padmanabhan, A., and Hansen, T. (2007). Modular Information Provider: A Grid-Independent Approach. In: *Proceedings of the National Science Foundation TeraGrid Annual Conference, TeraGrid’07* (CD-ROM), pp. 75-79.

- 2006 Wang, S., **Shook, E.**, Padmanabhan, A., Briggs, R., and Pearlman, L. (2006). Developing the Modular Information Provider (MIP) to Support Interoperable Grid Information Services. In: *Proceedings of Grid and Cooperative Computing GCC 2006: The Fifth International Conference*, IEEE Computer Society, pp. 448-453.

### Book Reviews

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- 2014 **Shook, E.** (2014). *Mapping in the Cloud* Peterson, Michael P. 2014. New York: The Guilford Press, 421 pages, ISBN: 978-1462510412. *Cartography and Geographic Information Science (CaGIS)*, 41(5): 456-457. DOI: 10.1080/15230406.2014.970349.

### Publications in Review or Revision

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- 2019 Haynes, D., Philip, M., and **Shook, E.** (2019). The GIScientist Guide for Analyzing Raster Data: a Comparative Analysis of Big Raster Platforms. In review, *International Journal of Geographical Information Science*.
- 2019 Runck, B.C., Manson, S.M. Jordan, N.R., **Shook, E.**, and Gini, M. (2019). Characterizing the impacts of collaboration on the 1 adoption of multifunctional agriculture using natural language processing. In review, *Journal of Artificial Societies and Social Simulation*.
- 2019 Manson, S., An, L., Clarke, K., Heppenstall, A., Koch, J., Morgan, F., O'Sullivan, D., Runck, B., **Shook, E.**, Tesfatsion, L. (2019). Methodological issues of spatial agent-based models. In review, *Journal of Artificial Societies and Social Simulation*.
- 2018 Ajayakumar, J. and **Shook, E.** (2018). Leveraging Parallel Spatio-Temporal Computing for Crime Analysis in Large Datasets: Analyzing Trends in Near-repeat Phenomenon of Crime in Cities. In revision, *International Journal of Geographical Information Science*.
- 2018 Wren, C., Botha, S., De Vynck, J., Marean, C.W., Janssen, M.A., Hill, K., **Shook, E.**, Harris, J.A. Wood, B.A., Venter, J., Cowling, R., Franklin, J., Potts, A., and Fisher, E.C. (2018). The foraging potential of the Holocene Cape South Coast of South Africa without the Palaeo-Agulhas Plain. In review, *Quaternary Science Reviews*.
- 2018 **Shook, E.**, Merson, J., and Wentz, E.A. (2018). Network Flow Algebra for Modeling Non-Point Source Pollution: A Case Study Modeling Nitrogen in Niantic Watershed, Connecticut. In revision, *Transactions in GIS*.
- 2018 Engelbrecht, F.A., Marean, C.W., Cowling, R., Potts, A.J., Engelbrecht, C., Nkoana, R., O'Neil, D., Fisher, E., **Shook, E.**, Franklin, J., Neumann, F., Scott, L., Thatcher, M., McGregor, J., Van der Merwe, J., Dedekind, Z., and Difford, M. (2018). Downscaling Last Glacial Maximum climate over southern Africa. In revision, *Quaternary Science Reviews*.

### Presented Posters

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- 2018 Waibel, X. (2018). Scaling Big Geospatial Data Analytics using Apache Spark. (Faculty advisor: **Shook, E.**) *2018 Undergraduate Research Symposium*, University of Minnesota, Minneapolis, April 20, 2018.

- 2016 Haynes, D., Kugler, T., **Shook, E.**, and Manson, S. (2016). Terra Populus: Integrated Data on Population and Environment. *11th Gateway Computing Environments Conference*, San Diego, CA, November 2-3, 2016.
- 2016 Hill, A., Ajayakumar, J., Turner, V., and **Shook, E.** (2016). Twitter and Media Response to Lead in Water After the Flint Water Crisis. *4th Annual Water and Land Symposium*, Kent State University, Kent, OH, October 5-6, 2016.
- 2015 Curtis, A., Jefferis, E., Porter, L., **Shook, E.** (2015). Mapping the Health and Crime Nexus Using Spatial Video and Geonarratives: Examples from the United States. *23rd GIS Research UK (GISRUK) Conference*, Leeds, UK, April 15-17, 2015.
- 2014 **Shook, E.** (2014). Toward a New Programming Language to Lower the Barriers to Entry for CyberGIS. *Second International Conference on CyberGIS and Geodesign (CyberGIS'14)*, Redlands, CA, August 19-21, 2014.
- 2014 Curtis, J.W., Curtis, A., Smith, S., and **Shook, E.** (2014). Geonarratives as an Approach to Understand Resident Environmental Perceptions and their Implications in Long-term Recovery: Joplin, Missouri Three Years Post-Tornado. *Natural Hazards Workshop*, Broomfield, Colorado, CO, June 26, 2014.
- 2014 Feng, Z. (Undergraduate student), **Shook, E.** (2014). A Parallel Programming Language for Cartographic Modeling. *Undergraduate Symposium on Research, Scholarship and Creative Activity*, Kent State University, Kent, OH, April 11, 2014.
- 2013 **Shook, E.** (2013). Investigating Integrated Space-Time Representations in Epidemic Agent-based Modeling: A CyberGIS Use Case. *The NSF CyberGIS All Hands Meeting 2013*, Seattle, WA, September 15-17, 2013.
- 2012 **Shook, E.**, and Wang, S. (2012). Understanding the Influence of Spatial and Temporal Resolutions on Agent-based Modeling of Large-scale Epidemics. *The First International Conference on Space, Time, and CyberGIS*, Urbana, IL, August 6-9, 2012.
- 2011 Banion, N., Wilson, B., Goel, V., Gallagher, E., Yang, J., Zhang, B., Evans, R., and **Shook, E.** (2011). IMap: An Online GIS Tool for Pedestrian Directions on Campus. *Illinois GIS Association (ILGISA), 2011 Spring Conference*, Urbana, IL, April 19-20, 2011.
- 2010 **Shook, E.**, Wang, S., and Tang, W. (2010). Toward a Parallel Spatially Explicit Agent-Based Modeling Framework. *The National Science Foundation TeraGrid Annual Conference, TeraGrid'10*, Pittsburgh, PA, August 2-5, 2010.

## Presentations

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- 2019 Wren, C., Marean, C., **Shook, E.**, Hill, K., Janssen, M. "What makes a forager turn coastal? An agent-based approach to coastal foraging on the dynamic South African Paleoscape" *The 84th Annual Meeting for the Society for American Archaeology*, Albuquerque, NM, Apr. 10-14, 2019.
- 2019 **Shook, E.** "Developing Cyber Literacy for GIScience Ideas and Strategies" *The Association of American Geographers 114th Annual Meeting*, Washington, DC, Apr. 3-7, 2019.

- 2019 Bakker, J. and **Shook, E.** “Toward a Scalable Agriculture Classification Model: Comparison of Remote Sensing Crop Classification Methods in the Red River Valley, Minnesota” *The Association of American Geographers 114th Annual Meeting*, Washington, DC, Apr. 3-7, 2019.
- 2019 Shepard, C. and **Shook, E.** “Hour of Cyberinfrastructure: Using Data-Driven Education to Improve CyberGIScience Education” *The Association of American Geographers 114th Annual Meeting*, Washington, DC, Apr. 3-7, 2019.
- 2019 Wang, S., Tarboton, D., Hodgson, M. **Shook, E.**, Li, X.\* “A Map Algebra Approach to Analyzing Spatiotemporal Data” *The Association of American Geographers 114th Annual Meeting*, Washington, DC, Apr. 3-7, 2019.
- 2019 **Shook, E.** “A Programming Language For Expressing Spatial-Temporal Computation in Parallel (ForEST)” *Minnesota Brown Marmorated Stink Bug (BMSB) Dispersal Modelling Project Kickoff Meeting*, Minneapolis, MN, Feb. 22, 2019.
- 2019 **Shook, E.** “The Hour of Cyberinfrastructure Project: Developing Cyber Literacy for GIScience” (**Invited**) *2019 GIS Networking and Career Fair*, Minneapolis, MN, Feb. 12, 2019.
- 2018 Bowlick, F., **Shook, E.**, and Kemp, K. “Cyber Literacy for GIScience: Toward Formalizing Geospatial Computing Education” *2018 American Geophysical Union (AGU) Fall Meeting*, Washington, DC, Dec. 10-14, 2018.
- 2018 **Shook, E.**, Del Vento, D., Zonca, A., and Wang, J. “GISandbox: A Science Gateway for Geospatial Computing” *PEARC’18: Practice and Experience in Advanced Research Computing 2018*, Pittsburgh, PA, Jul. 22-25, 2018.
- 2018 **Shook, E.** “CyberGIS and Geospatial Computing” Esri Development Center Series (Virtual), May 16, 2018.
- 2018 Arndt, J. and **Shook, E.** “Exploring New Spatial Approaches Toward Deep Learning for Satellite Image Classification” *The Association of American Geographers 114th Annual Meeting*, New Orleans, LA, Apr. 14, 2018.
- 2018 Ajayakumar, J., **Shook, E.**, and Turner, V.K. “Extracting Contextual Information from Spatio-Temporal Social Media Data during Extreme Events using Socio-Environmental Data Explorer (SEDE): A Case Study based on Social Media Response to Tornadoes in the United States” *The Association of American Geographers 114th Annual Meeting*, New Orleans, LA, Apr. 13, 2018.
- 2018 Turner, V.K., **Shook, E.**, and Ajayakumar, J. “Sarf 2.0: Transformations to the Social Amplification of Risk and Enabling New Social-Ecological Discovery Through Social Media” *The Association of American Geographers 114th Annual Meeting*, New Orleans, LA, Apr. 13, 2018.
- 2018 **Shook, E.** “Forest: A New Language For Expressing Spatio-Temporal Computing” *The Association of American Geographers 114th Annual Meeting*, New Orleans, LA, Apr. 11, 2018.
- 2018 Kemp, K., **Shook, E.**, and Bowlick, F. “Cyber Literacy for GIScience: Toward Formalizing Geospatial Computing Education” *The Association of American Geographers 114th Annual Meeting*, New Orleans, LA, Apr. 10, 2018.

- 2018 Del Vento, D., **Shook, E.**, and Zonca, A. “The GISandbox: A Science Gateway for Geospatial Computing” *2018 Annual Software Engineering Assembly (SEA) Conference Frontiers in Scientific Software*, Boulder, CO, Apr. 2-6, 2018.
- 2018 **Shook, E.** “XSEDE and the GISandbox” *Esri DevSummit* (Lightning talk), Palm Springs, CA, Mar. 5-7, 2018.
- 2018 **Shook, E.** “Geospatial Computing: Lowering Barriers and Advancing Science” Department of Geography, Environment, and Society Coffee Hour Series, University of Minnesota, Minneapolis, MN, Mar. 2, 2018.
- 2017 **Shook, E.** “Hiding Virtual Computing and Supercomputing inside a Notebook: GISandbox Science Gateway and Other User Experiences” XSEDE Service Provider Forum (Virtual), October 13, 2017.
- 2017 **Shook, E.** “Building a Language For Expressing Spatial and Temporal Methods in a (Super)computer” Minnesota Population Center (MPC), Minneapolis, MN, September 18, 2017.
- 2017 **Shook, E.** “IonE on XSEDE” Institute on the Environment, Saint Paul, MN, July 26, 2017.
- 2017 **Shook, E.** “Jupyter Notebooks and XSEDE” *2017 Paleoscape Workshop*, Mossel Bay, South Africa, June 27-30, 2017.
- 2017 Kalisky, S., Raad, M., and Kopp, S. (Organized by **Shook, E.**) “An Overview of Esri Cloud and Big Data Spatial Analytics Offerings Available to XSEDE” *XSEDE* (Virtual), <http://www.gisandbox.org/2017/05/an-overview-of-esri-cloud-and-big-data.html>, May 8, 2017.
- 2017 **Shook, E.** “The State of Computing in Geography: A Look Behind and a Look Ahead” *The Association of American Geographers 113th Annual Meeting*, Boston, MA, Apr. 4-7, 2017.
- 2017 Ajayakumar, J. and **Shook, E.** “Analyzing Spatio-Temporal Variations in Public Response through Twitter about the Potential Spread of Ebola in the United States” *The Association of American Geographers 113th Annual Meeting*, Boston, MA, Apr. 4-7, 2017.
- 2017 O’Neal, D., Marean, C., and **Shook, E.** “The Paleoscape Project for Studies of Modern Human Origins” XSEDE Extended Collaborative Support Services (ECSS) Symposium, XSEDE, Mar. 21, 2017.
- 2016 **Shook, E.** “Lowering Barriers to Parallelizing Geospatial Data Processing ” (**Invited**) Computer Science and Engineering Colloquia Series, University of Minnesota, Minneapolis, MN, Nov. 14, 2016.
- 2016 **Shook, E.** “Toward Easier Geographic Computing using the Parallel Cartographic Modeling Language” (**Invited**) *33rd International Geographical Congress* in Special Session: Geocomputation in the Cloud Age: Recent Advances, Beijing, China, Aug. 21-25, 2016.
- 2016 **Shook, E.** “Foundations and Principles of CyberGIS” (**Invited**) *GeoBytes Online Seminar Series* sponsored by the American Society of Photogrammetry and Remote Sensing (ASPRS) GIS Division in partnership with the Cartography and Geographic Information Society (CaGIS) and the Geographic and Land Information Society (GLIS), May 27, 2016.

- 2016 **Shook, E.** “Parallel Cartographic Modeling Language: A Language to Democratize Computational Geography” (**Invited**) Garrison Award and Tribute Sessions, *The Association of American Geographers 112th Annual Meeting*, San Francisco, CA, Mar. 29-Apr. 2, 2016.
- 2016 Ajayakumar, J., **Shook, E.**, and Turner, VK. “Socio-Environmental Data Explorer (SEDE)” *The Association of American Geographers 112th Annual Meeting*, San Francisco, CA, Mar. 29-Apr. 2, 2016.
- 2016 **Shook, E.** “Response to Ebola on Twitter” *The Association of American Geographers 112th Annual Meeting*, San Francisco, CA, Mar. 29-Apr. 2, 2016.
- 2015 Ajayakumar, J., **Shook, E.**, Curtis, A., and Curtis, J. “Web-based Framework for Geonarrative Mapping” *East Lakes Division Of The AAG Annual Meeting*, Kent, OH, Oct. 9-10, 2015.
- 2015 **Shook, E.** and Ajayakumar, J. “Processing Points in the Parallel Cartographic Modeling Language” *East Lakes Division Of The AAG Annual Meeting*, Kent, OH, Oct. 9-10, 2015.
- 2015 Curtis, J.W., Curtis, A., Paull, E., Sampsell, M., Hudson, C., Wuensch, H., Jefferis, E., Porter, L. **Shook, E.**, and Ostrowski, S. “Dismantling Hot Spots of Child Polyvictimization with Geospatial Techniques” *International Association of Crime Analysts Conference*, Denver, CO, Sept. 22-25, 2015.
- 2015 **Shook, E.** and Ajayakumar, J. “Processing Points in the Parallel Cartographic Modeling Language” *CyberGIS All Hands Meeting 2015*, Reston, VA, Sept. 14-16, 2015.
- 2015 **Shook, E.** “Parallel Cartographic Modeling” *Vespucci Institute - Advancing Geographic Information Science: The Past and Next Twenty Years*, Bar Harbor, ME, June 29-July 3, 2015.
- 2015 **Shook, E.**, Turner, V.K, and Ajayakumar, J. “Socio-Environmental Data Explorer Computational Workflow” National Socio-Environmental Synthesis Center (SESYNC) Workshop: *Kickoff Workshop: Socio-Environmental Data Explorer Workshop Series*, Annapolis, MD, June 22-24, 2015.
- 2015 Musigidilok, V., **Shook, E.**, Ajayakumar, J., Burke, R.V., Berg, B., Demeter, N., Hawkins, M., Ferree, J., Pellegrino, J., Tolli, D., Hansen, G., Chung, S., and Upperman, J.S. “American Red Cross Scientific Advisory Committee Mobile Apps Study” American Red Cross Scientific Advisory Meeting, Washington, DC, June 2015.
- 2015 **Shook, E.**, and Ajayakumar, J. “Experiences using ROGER with the Parallel Cartographic Modeling Language” ROGER Supercomputer Meeting (Telecast presentation), June 2015.
- 2015 Turner, V.K., **Shook, E.**, and Ajayakumar, J. “Socio-Environmental Data Explorer (SEDE): Part I and II” National Socio-Environmental Synthesis Center (SESYNC) Workshop: *Data-Intensive Analysis and Modeling Theme Meeting*, Annapolis, MD, June 1-2, 2015.
- 2015 **Shook, E.**, Ajayakumar, J., Vutla, S., and Kukkadapu, G. “Lowering Barriers for CyberGIS” *The Association of American Geographers 111<sup>th</sup> Annual Meeting*, Chicago, IL, April 21-25, 2015.

- 2015 Engelbrecht, F., Nkoana, R., Cowling, R., Fisher, E., Franklin, J., Marean, C.W., O'Neal, D., Potts, A. and **Shook, E.** "Detailed dynamic modelling of glacial climate over the Cape south coast of South Africa" Paleanthropology Society 2015 Annual Meeting, San Francisco, CA, April 14-15, 2015.
- 2015 **Shook, E.** "Social Media Data Analytics" Research Brown Bag Meeting hosted by GIS, Health and Hazards Lab and HPCGIS Lab, Kent, OH, March 2015.
- 2014 **Shook, E.** "CyberGIS Education From The Bottom Up" (**Invited Presentation** as a CyberGIS Fellow) (Lightning talk) *The Second International Conference on CyberGIS and Geodesign*, Redlands, CA, August 19-21, 2014.
- 2014 **Shook, E.** "Toward a New Programming Language to Lower the Barriers to Entry for CyberGIS" (Lightning talk) *The Second International Conference on CyberGIS and Geodesign*, Redlands, CA, August 19-21, 2014.
- 2014 **Shook, E.** "Opportunities and Challenges For Mining Spatially-Explicit Social Media Data For Socio-Environmental Research" (**Invited Presentation**) National Socio-Environmental Synthesis Center (SESYNC) Workshop: *How can social media be used to explore coupled socio-environmental systems?*, Annapolis, MD, July 28-30, 2014.
- 2014 **Shook, E.** "Paleoscape Project And My Experiences As An XSEDE Campus Champion Fellow" (**Invited Presentation** as an XSEDE Campus Champion Fellow) (Lightning talk) *XSEDE 2014: Extreme Science and Engineering Discovery Environment: Engaging Communities*, Atlanta, GA, July 13-18, 2014.
- 2014 **Shook, E.** "Climate, Vegetation, and Agent-based Model Integration into a Computational Workflow On XSEDE Supercomputers" *Paleoscaping Workshop*, George, Republic of South Africa, July 8-10, 2014.
- 2014 Curtis, J.W., Curtis, A., Smith, S., and **Shook, E.** "Using Geonarratives to Understand Environmental Perception in Post-Disaster Recovery: A Pilot Study from the May 22, 2011 Joplin Tornado" *International Research Committee on Disasters Researchers Meeting*, Broomfield, CO, June 26, 2014.
- 2014 **Shook, E.** "Campus Champion Fellow Experiences: Project - Simulating Glacial Maxima Climates in Southern Africa For the Purpose of Understanding Modern Human Origins" (**Invited Presentation** as an XSEDE Campus Champion Fellow) Campus Champion Monthly Teleconference Meeting (Remote presentation), March 18, 2014.
- 2014 **Shook, E.**, Behzad, B., Wang, S., Hodgson, M. "Designing a Parallel and High-performance Computing Language for Geographic Information Scientists" *The Association of American Geographers 110<sup>th</sup> Annual Meeting*, Tampa, FL, March 8-12, 2014.
- 2014 **Shook, E.** "A Computational Approach to Understanding Spatial and Temporal Granularities in Agent-based Modeling" (**Invited Presentation** for The William L. Garrison Award for Best Dissertation in Computational Geography Session) *The Association of American Geographers 110<sup>th</sup> Annual Meeting*, Tampa, FL, March 8-12, 2014.
- 2013 **Shook, E.** "Investigating Integrated Space-Time Representations in Epidemic Agent-based Modeling: A CyberGIS Use Case" *The NSF CyberGIS All Hands Meeting 2013 (Invited Plenary)*, Seattle, WA, September 15-17, 2013.

- 2013 **Shook, E.**, and Wang, S. “Investigating the Influence of Spatial and Temporal Granularities in a Parsimonious Epidemic Agent-Based Model” *The Association of American Geographers 109<sup>th</sup> Annual Meeting*, Los Angeles, CA, April 9-13, 2013.
- 2012 Behzad, B., Liu, Y., **Shook, E.**, Finn, M.P., Mattli, D.M., and Wang, S. “A Performance Profiling Strategy for High-Performance Map Re-Projection of Coarse-Scale Spatial Raster Data” *The 2012 AutoCarto International Symposium on Automated Cartography*, Columbus, OH, September 16-18, 2012.
- 2012 Finn, M.P., Liu, Y., Mattli, D.M., Guan, Q., Yamamoto, K.H., **Shook, E.**, and Behzad, B. “pRasterBlaster: High-Performance Small-Scale Raster Map Projection Transformation Using the Extreme Science and Engineering Discovery Environment” *XXII International Society for Photogrammetry and Remote Sensing Congress (ISPRS2012)*, Melbourne, Australia, August 25-September 1, 2012.
- 2012 Leetaru, K., **Shook, E.**, and Wang, S. “A CyberGIS Approach to Digital Humanities and Social Sciences: The World of Textual Geography and a Case Study of Wikipedia’s History of the World” *The First International Conference on Space, Time, and CyberGIS*, Urbana, IL, August 6-9, 2012.
- 2012 Liu, Y., **Shook, E.**, Leetaru, K., Padmanabhan, A., and Wang, S. “GISolve Open Service APIs for CyberGIS Software Integration” *The First International Conference on Space, Time, and CyberGIS*, Urbana, IL, August 6-9, 2012.
- 2012 **Shook, E.**, and Wang, S. “Investigating the Influence of Spatial and Temporal Resolutions in a Large-scale Epidemic Agent-Based Model” *The Association of American Geographers 108<sup>th</sup> Annual Meeting*, New York, NY, February 24-28, 2012.
- 2011 **Shook, E.**, and Wang, S. “A Parallel Input-Output Strategy for Resolving Data Challenges in Large-Scale Agent-Based Models” *The Association of American Geographers 107<sup>th</sup> Annual Meeting*, Seattle, WA, April 12-16, 2011.
- 2010 **Shook, E.**, Wang, S., and Tang, W. “Examining the influence of spatial patterns on parallel agent-based modeling performance” *The Association of American Geographers 106<sup>th</sup> Annual Meeting*, Washington, DC, April 14-18, 2010.
- 2009 **Shook, E.**, Tang, W., and Wang, S. “A Parallel Computing Approach for Spatially-Explicit Agent-Based Models” *The Association of American Geographers 105<sup>th</sup> Annual Meeting*, Las Vegas, NV, March 22-27, 2009.
- 2008 **Shook, E.**, Liu, Y., and Wang, S. “A Publish/Subscribe Model for Integration of Cyberinfrastructure-Enabled Geospatial Services” *The Association of American Geographers 104<sup>th</sup> Annual Meeting*, Boston, MA, April 15-19, 2008.
- 2007 **Shook, E.**, Wang, S., Zhu, X., Liu, Y. “Synthesizing Spatial-Temporal Data to Enable Geospatial Analysis of Biomass-based Bioenergy” *Association of American Geographers Westlake Annual Meeting*, Urbana, IL, November 8-10, 2007.
- 2006 **Shook, E.**, Briggs, R., Wang, S., and Padmanabhan, A. “A Modular Information Provider Integrator to Support Site-Level MDS4” *Open Science Grid (OSG) Consortium Meeting*, University of Washington, Seattle, WA, August, 2006.

- 2006 Wang, S., **Shook, E.**, Padmanabhan, A., Briggs, R., and Pearlman, L “Developing the Modular Information Provider (MIP) to Support Interoperable Production-Level Grid Information Services” *The National Science Foundation TeraGrid Annual Conference, TeraGrid’06*, Indianapolis, IN, June, 2006.

### Panels (Organizer)

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- 2018 Panel Organizer and Moderator “Geospatial Data Science” Panel members: Snigdhanu Chatterjee, Atena Haghghattalab, Sona Maniyan, Mohamed Mokbel, Paul Morin, Dawn Wright, *2018 Spatial Forum*, University of Minnesota, Minneapolis, MN, Nov. 14, 2018.
- 2017 Panel Organizer and Moderator “CyberGIS Reflections from the Past and Projections for the Future” Panel members: Michael Goodchild, Weihe (Wendy) Guan, Wenwu Tang, Shaowen Wang, Chuanrong Zhang, *The Association of American Geographers 113th Annual Meeting*, Boston, MA, Apr. 4-7, 2017.

### Panels (Panelist)

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- 2018 Panelist “Big Data and the Future of Social Research” CLA Time Past, Time Present, Time Future, 150th Anniversary Celebration, College of Liberal Arts, University of Minnesota, Minneapolis, MN, Oct. 11, 2018.
- 2018 Panelist “CLA RoundTable: Working As a Team, Collaborative Proposals” College of Liberal Arts, University of Minnesota, Minneapolis, MN, Sep. 21, 2018.
- 2018 Panelist “Science Gateways and You” *PEARC’18: Practice and Experience in Advanced Research Computing 2018*, Pittsburgh, PA, Jul. 25, 2018.
- 2018 Panelist “Symposium on CyberGIS and Spatial Data Science: CyberGIS and Spatial Data Science Curriculum” *The Association of American Geographers 114<sup>th</sup> Annual Meeting*, New Orleans, LA, Apr. 10, 2018.
- 2017 Panelist “Spatial Demography Mixer” Minnesota Population Center, Minneapolis, MN, Nov. 13, 2017.
- 2017 Panelist “The Web GIS Evolution: Implications for Curricula” *The Association of American Geographers 113<sup>th</sup> Annual Meeting*, Boston, MA, Apr. 4-7, 2017.
- 2016 Panelist “Teaching Web and Mobile GIS” *The Association of American Geographers 112<sup>th</sup> Annual Meeting*, San Francisco, CA, Mar. 29-Apr. 2, 2016.
- 2014 Panelist “CyberGIS Education Panel, Symposium on Synergistic Advances of CyberGIS and Geography” *The Association of American Geographers 110<sup>th</sup> Annual Meeting*, Tampa, FL, March 8-12, 2014.

## Honors and Awards

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### Academic Organization Awards

- 2013 **William L. Garrison Award for Best Dissertation in Computational Geography**, “A Computational Approach to Understanding Spatial and Temporal Granularities in Agent-based Modeling” (**\$3,500**), Marble Fund for Geographic Science of the Association of American Geographers (AAG)

### Fellowships

- 2014 **CyberGIS Fellow**, “CyberGIS Education From The Bottom Up” (**\$4,947**), NSF-supported CyberGIS Project, (2014-2015)
- 2013 **XSEDE Campus Champion Fellow**, “Designated Project: Simulating Glacial Maxima Climates in Southern Africa For the Purpose of Understanding Modern Human Origins” (**\$15,000**), NSF-supported Extreme Science and Engineering Discovery Environment (XSEDE), with Curtis Marean (PI, ASU) and David O’Neal (ECSS, Pittsburgh Supercomputing Center) (2013-2014)
- 2007 **Beatty (Graduate) Fellowship**, Department of Geography (**\$14,000**), University of Illinois at Urbana-Champaign (2007-2008)

### Paper and Poster Awards

- 2017 **Honorable Mention**, “Normalization Strategies for Enhancing Spatio-Temporal Analysis of Social Media Responses during Extreme Events: A Case Study based on Analysis of Four Extreme Events using Socio-Environmental Data Explorer (SEDE)” (**Student lead author: Ajayakumar, J.**), In: *Proceedings of the International Symposium on Spatiotemporal Computing*, Harvard University, Boston, MA, August 7-9 2017
- 2015 **Best Paper Award**, “Paleoscape Model of Coastal South Africa During Modern Human Origins: Progress in Scaling and Coupling Climate, Vegetation, and Agent-based Models on XSEDE” (In Accelerating Discovery track), In: *Proceedings of the Conference on Extreme Science and Engineering Discovery Environment: XSEDE’15*, 2:1-2:8.
- 2015 **Best Lightning Talk**, “Paleoscape Model of Coastal South Africa During Modern Human Origins: Progress in Scaling and Coupling Climate, Vegetation, and Agent-based Models on XSEDE” (Awarded to co-author Colin Wren who presented the paper), Presented at the Conference on Extreme Science and Engineering Discovery Environment: XSEDE’15
- 2007 **First Place Winner** of Doctoral-Level Student Competition (**\$100**), *Association of American Geographers Westlake Annual Meeting*, Urbana, IL. November 8-10, 2007

### Teaching Awards

- 2016 **David Olson Appreciation Award** in recognition of a faculty member who has stood as a leader, mentor, and advocate for graduate students of Kent State University Geography, Kent State University

- 2011 **Teacher Ranked as Outstanding (top 10%** in overall teaching effectiveness among all campus TAs), Center for Teaching Excellence, University of Illinois at Urbana-Champaign, Fall 2011

## Awarded Research Grants

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### External Sources

- 2018 **PI**, “CyberTraining: Hour of Cyberinfrastructure: Developing Cyber Literacy for Geographic Information Science” (**\$480,970** (\$373,990 to UMN)), NSF Office of Advanced Cyberinfrastructure (OAC), with Co-PIs: Forrest Bowlick, Karen Kemp, and Anand Padmanabhan
- 2018 **Senior Personnel**, “Developing a spatially explicit bio-economic dispersal model to aid with the management of Halyomorphahalys” (**\$569,268**), Minnesota Invasive Terrestrial Plants and Pests Center, with PI: Terry Hurley; Co-PIs: Senait Senay, Philip Pardey, William Hutchison
- 2017 **Senior Personnel**, “SI2-S2I2 Conceptualization: Geospatial Software Institute” (**\$500,000**), NSF Office of Advanced Cyberinfrastructure (OAC), with PI: Shaowen Wang; Co-PIs: Daniel Katz, Donna Cox, Margaret Palmer, Paul Morin
- 2014 **PI**, “RAPID: Capturing Behavioral Response and Perceived Risk to Ebola Using Social Media” (**\$41,197**), NSF Infrastructure Management and Extreme Events (IMEE), with Co-PIs: Andrew Curtis (KSU), Jacqueline Curtis (KSU), Gregory Gibson (KSU), Christopher Woolverton (KSU)
- 2014 **Co-PI**, “The Socio-Environmental Data Explorer (SEDE): Integrating Social Media and Environmental Data in CyberGIS to Explore Environmental Hazard Risk Perception” (**\$43,783 (KSU, RA support)**; \$60,000 (SESYNC, estimated cost for hosting four workshops); \$103,783 (total estimated award)), NSF-supported National Socio-Environmental Synthesis Center (SESYNC), with V. Kelly Turner (PI, KSU)

### Internal Sources

- 2019 **PI**, “Creating an Open Minnesota Farm Field Dataset using Satellites and Supercomputers” (**\$49,000**), Center for Urban and Regional Affairs (CURA), University of Minnesota, with Paul West and James Gerber (Institute on the Environment (IonE)) and Mike Dolbow (Minnesota IT Services (MnIT))
- 2018 **Team Member**, “The Many Faces of Reproducibility” (**Workshop support**), Interdisciplinary Collaborative Workshop Award, College of Liberal Arts, University of Minnesota, with PI: Alan Love; and 38 team members
- 2018 **Project Lead**, “GeoCommons Exploratory Project” (**25% RA Support**), College of Liberal Arts, as part of 3-year unit plan for Department of Geography, Environment, and Society to explore the creation of a multi-disciplinary collaborative space for geospatial sciences called the GeoCommons.
- 2017 **PI**, “Toward Transforming Geocomputing in IPUMS-Terra” (**Student support**), Minnesota Population Center (MPC) Summer 2017 Diversity Fellowship Program (one graduate and one undergraduate student for 10 weeks)

- 2015 **Travel Award**, “CyberGIS Workshop (Part of Association of American Geographers Annual Meeting)” (**\$500**), University Teaching Council (Kent State)
- 2009 **Travel Award for student members** of the Geography Graduate Student Association (GGSA) (**\$3,795**), applied as treasurer of GGSA for GGSA members to attend *the Association of American Geographers 105<sup>th</sup> Annual Meeting*

### Undergraduate Research

- 2017 **Mentor**, “Utilizing Big Data Processing to Improve Performance of the Parallel Cartographic Modeling Language (PCML)” (**\$1,500** for Xinran (Julina) Duan), University of Minnesota, Undergraduate Research Opportunities Program (UROP)
- 2011 **Mentor**, 1867 Society Fund Award (**\$1,100**) to the (Undergraduate) GIS Group for IMap project enhancements, University of Illinois at Urbana-Champaign

### Awards for Computing Resources

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- 2019 **PI**, “GISandbox: A Science Gateway for Geospatial Computing” (**550,000 SUs** (Service Units) - one service unit is equivalent to one normalized computing hour - with XSEDE Extended Collaborative Support - **valued at \$109,117.00**), XSEDE
- 2018 **PI**, “GISandbox: A Gateway for Research, Education, and Experimentation in Geographic Information Systems and Science (GIS) (Renewal)” (**152,500 SUs** (Service Units) - one service unit is equivalent to one normalized computing hour - with XSEDE Extended Collaborative Support - **valued at \$10,344.75**), XSEDE
- 2017 **PI**, “GISandbox: A Gateway for Research, Education, and Experimentation in Geographic Information Systems and Science (GIS)” (**150,000 SUs** (Service Units) - one service unit is equivalent to one normalized computing hour - with XSEDE Extended Collaborative Support - **valued at \$12,261.50**), XSEDE
- 2017 **Co-PI**, “Simulating climate-environment-human interactions in coastal South Africa: Continuing the Development of a Paleoscape Model for studies of modern human origins” (**440,000+ SUs** (Service Units) - one service unit is equivalent to one normalized computing hour - with XSEDE Extended Collaborative Support - **valued at \$18,891.53**), XSEDE
- 2016 **Co-PI**, “Simulating climate-environment-human interactions in coastal South Africa: Continuing the Development of a Paleoscape Model for studies of modern human origins” (**1.0 million SUs** (Service Units) - one service unit is equivalent to one normalized computing hour - **valued at \$44,371**), XSEDE, with Curtis W. Marean (PI, ASU) and Francois Engelbrecht (Co-PI, Council for Scientific and Industrial Research (CSIR), Republic of South Africa)
- 2013 **Co-PI**, “Simulating glacial climate in coastal South Africa: Developing the climate parameters to model a paleoscape during modern human origins” (**1.2 million SUs** (Service Units) - one service unit is equivalent to one normalized computing hour - **valued at \$83,749**), XSEDE, with Curtis W. Marean (PI, ASU), Co-PIs: Richard Cowling (Nelson Mandela Metropolitan University (NMMU), Republic of South Africa), Francois Engelbrecht (Council for Scientific and Industrial Research (CSIR), Republic of South Africa), Janet Franklin (ASU), Marco Janssen (ASU), Alastair Potts (NMNU, Republic of South Africa)

2013 **PI**, “CyberGIS-enabled Spatially Explicit Epidemic Agent-based Models and Large-scale Spatial Analyses” (**160,000 SUs** (Service Units) - one service unit is equivalent to one normalized computing hour), XSEDE

## Employment

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- 2007 - 2013 **Graduate Research Assistant**  
CyberInfrastructure and Geospatial Information (CIGI) Laboratory,  
University of Illinois at Urbana-Champaign
- 2008 (Summer) **Graduate Assistant**  
Parallel Programming Laboratory (PPL), University of Illinois at  
Urbana-Champaign
- 2006 - 2007 **Grid Analyst and Operation Specialist (full-time)**  
Grid Research and education group @ ioWa (GROW), The University of Iowa
- 2005 - 2006 **Graduate Research Assistant**  
Grid Research and education group @ ioWa (GROW), The University of Iowa

## Teaching

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- 2019 (Spring) **Instructor**  
Principles of Geocomputing (Graduate and Undergraduate), Department of  
Geography, Environment, and Society, University of Minnesota
- 2019 (Spring) **Instructor**  
CyberGIS Seminar (Graduate), Department of Geography, Environment, and  
Society, University of Minnesota
- 2018 (Fall) **Instructor**  
Advanced Geocomputing (Graduate and Undergraduate), Department of  
Geography, Environment, and Society, University of Minnesota
- 2018 (Spring) **Instructor**  
Principles of Geocomputing (Graduate and Undergraduate), Department of  
Geography, Environment, and Society, University of Minnesota
- 2018 (Spring) **Instructor**  
Mapping Our World (Online Introductory Undergraduate), Department of  
Geography, Environment, and Society, University of Minnesota
- 2017 (Spring) **Instructor**  
Principles of Geocomputing (Graduate and Undergraduate), Department of  
Geography, Environment, and Society, University of Minnesota
- 2017 (Spring) **Instructor**  
CyberGIS Seminar (Graduate), Department of Geography, Environment, and  
Society, University of Minnesota

- 2016 (Fall)     **Instructor**  
Advanced Geocomputing (Graduate and Undergraduate), Department of  
Geography, Environment, and Society, University of Minnesota
- 2016 (Spring)   **Instructor**  
Principles of Geographic Information Science (Graduate and Undergraduate),  
Department of Geography, Kent State University
- 2015 (Fall)     **Instructor**  
Web and Mobile GIS (Graduate and Undergraduate), Department of  
Geography, Kent State University
- 2015 (Spring)   **Instructor**  
CyberGIS (Taught as hybrid online/face-to-face course) (Graduate and  
Undergraduate), Department of Geography, Kent State University
- 2014 (Fall)     **Instructor**  
Web and Mobile GIS (Graduate and Undergraduate), Department of  
Geography, Kent State University
- 2014 (Spring)   **Instructor**  
CyberGIS (Graduate and Undergraduate), Department of Geography, Kent  
State University
- 2011 (Fall)     **Teaching Assistant**  
Introduction to GIS (Undergraduate), Department of Geography, University of  
Illinois at Urbana-Champaign
- 2011 (Summer)   **Teaching Assistant**  
Web Design and Construction for Organizations (Graduate), Graduate School  
of Library and Information Science, University of Illinois at  
Urbana-Champaign

### **Short Courses and Invited Lectures**

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- 2018 (Fall)     **Short Course Instructor**  
Capturing and Analyzing Social Media Data using Twitter, Institute for Social  
Science Research, Arizona State University
- 2018 (Spring)   **Short Course Instructor**  
Capturing and Analyzing Social Media Data using Twitter, Institute for Social  
Science Research, Arizona State University
- 2017 (Summer)   **Short Course Instructor**  
Capturing and Analyzing Social Media Data using Twitter, Digital Liberal Arts  
(DLA) Workshop, co-sponsored by Macalester College and the University of  
Minnesota Digital Arts Sciences + Humanities (DASH)

- 2017 (Spring) **Invited Lecturer (Virtual)**  
Cyberinfrastructure, CyberGIS, and PCML (Parallel Cartographic Modeling Language), Programming and Databases in Geography, Indiana University-Purdue University Indianapolis, April 20, 2017
- 2017 (Spring) **Short Course Instructor**  
Capturing and Analyzing Social Media Data using Twitter, Institute for Social Science Research, Arizona State University
- 2016 (Fall) **Short Invited Lecture**  
Spatial Computing (Undergraduate and Graduate), Department of Computer Science, University of Minnesota
- 2015 (April 24) **Short Course Instructor**  
Parallel Cartographic Modeling Language - Introduction to Spatial Data Processing in Python, CyberGIS Education Workshop held during AAG Annual Meeting, Chicago, IL
- 2015 (Spring) **Invited Lecturer**  
Senior Seminar (Undergraduate), Kent State University
- 2013 (Fall) **Invited Lecturer**  
Research Seminar (Graduate), Department of Management and Information Systems, Kent State University
- 2013 (Fall) **Invited Lecturer**  
Spatial Programming (Graduate and Undergraduate), Department of Geography, Kent State University
- 2011 (Fall) **Instructor and Short Course Developer**  
Short course on WebGIS (Undergraduate, Graduate, Faculty), University of Illinois at Urbana-Champaign

#### Graduate Students (Advisor)

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- 2018 Jacob Arndt, M.GIS, Master of Geographic Information Science, University of Minnesota
- 2014 Jayakrishnan Ajayakumar, M.D.S, Master of Digital Sciences (Advised Capstone project), Kent State University

#### Graduate Students (Committee Member)

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- 2018 Bryan Runck, Ph.D., Department of Geography, Environment, and Society, University of Minnesota
- 2017 Amanda Colucci, Ph.D., Department of Geography, Kent State University
- 2016 Reeba Paul, Ph.D., Department of Biological Sciences, Kent State University
- 2016 Megan Hornyak, M.A., Department of Geography, Kent State University

- 2015 Geoffrey Hill, Ph.D., Graduate School of Management, Kent State University  
 2014 Gordon Cromley, M.A., Department of Geography, Kent State University

### Undergraduate Latin Honors (Advisor)

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- 2018 Xinran (Julina) Waibel (Duan), B.S., Computer Science, University of Minnesota  
 2018 Emily Ruetz, B.S., Computer Science, University of Minnesota

### Current Advisees

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- Jesse Bakker, M.A., Geography, Environment, and Society, University of Minnesota
- Katherine Dooley, MGIS, Geography, Environment, and Society, University of Minnesota
- Jasper Johnson, MGIS, Geography, Environment, and Society, University of Minnesota
- Kuan-Jui Lin, MGIS, Geography, Environment, and Society, University of Minnesota
- Alison Link, MGIS, Geography, Environment, and Society, University of Minnesota
- Iris Yan, MGIS, Geography, Environment, and Society, University of Minnesota
- Lauren Strug, MGIS, Geography, Environment, and Society, University of Minnesota

### Professional Services

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#### Leadership

- 2019 **Guest Editor**, *International Journal of Geo-Information* Special Issue "Big Data Computing for Geospatial Applications" with Zhenlong Li, Wenwu Tang, Qunying Huang, and Qingfeng Guan
- 2019 **Co-Organizer**, AAG-UCGIS Summer School 2019, *Reproducible Problem Solving with CyberGIS and Geospatial Data Science*, University of Illinois at Urbana-Champaign, July 8-13, 2019 with Coline Dony (AAG), Diana Sinton (UCGIS), Shaowen Wang (UIUC), and Anand Padmanbhan (UIUC)
- 2019 **Workshop Co-Organizer**, Developing Cyber Literacy for GIScience One Hour at a Time, University Consortium for Geographic Information Science (UCGIS) 2019 Symposium *The Geospatial Humanities: Transdisciplinary Opportunities for the GIScience Community*, Washington, DC, June 10, 2019 (Accepted)
- 2019 **Workshop Co-Organizer**, *Hour of Cyberinfrastructure (Hour of CI) 2019 In-Person Project Workshop*, Smithsonian National Zoo & Conservation Biology Institute, Washington, DC, Apr. 1-2, 2019

- 2019 **Program Committee and Co-Organizer**, Multiple sessions in AAG 2019 including Symposium on Frontiers in Geospatial Data Science, *The Association of American Geographers 115<sup>th</sup> Annual Meeting*, Washington DC, April 3-7, 2019
- 2018 **Co-Organizer**, Multiple sessions in AAG 2018 Symposium on CyberGIS and Spatial Data Science, *The Association of American Geographers 114<sup>th</sup> Annual Meeting*, New Orleans, LA, April 10-14, 2018
- 2017 **Workshop Co-Organizer**, SARF 2.0: Pilot Study Workshop, National Socio-Environmental Synthesis Center (SESYNC), Annapolis, MD, November, 16-17, 2017
- 2017 **Workshop Co-Organizer**, SARF 2.0: Enabling New Discovery and Transforming Risk Communication through Social Media Workshop Series, National Socio-Environmental Synthesis Center (SESYNC), Annapolis, MD, June, 8-9, 2017
- 2017 - **Vice Chair** Education Committee, University Consortium for Geographic Information Science (UCGIS)
- 2017 **Lead Organizer of 17-person Organizing Committee**, AAG 2017 Symposium on CyberGIS for Advancing Data-Intensive Geographic Research and Education, sponsored by 3 specialty groups, consisting of 4 Paper Sessions and 1 Panel Session, Mar. 5, 2017
- 2016 - **Editor for Computing Platforms** Knowledge Area, GIS&T Body of Knowledge 2.0, University Consortium for Geographic Information Science ([gistbok.ucgis.org](http://gistbok.ucgis.org))
- 2016 - **Executive Committee** Master of Geographic Information Science, University of Minnesota
- 2016 **Workshop Co-Organizer**, Social Amplification of Risk 2.0 (SARF 2.0) Workshop: Socio-Environmental Data Explorer Workshop Series, National Socio-Environmental Synthesis Center (SESYNC), Annapolis, MD, August 10-11, 2016
- 2016 **Co-Organizer**, Multiple sessions on High-performance Geospatial Computing and CyberGIS, *The Association of American Geographers 112<sup>th</sup> Annual Meeting*, San Francisco, CA, March 29-April 2, 2016
- 2015 **Workshop Co-Organizer**, Kickoff Workshop: Socio-Environmental Data Explorer Workshop Series, National Socio-Environmental Synthesis Center (SESYNC), Annapolis, MD, June 22-24, 2015
- 2015 **Co-Organizer**, Multiple sessions on High-performance Geospatial Computing and CyberGIS, *The Association of American Geographers 111<sup>th</sup> Annual Meeting*, Chicago, IL, April 21-25, 2015
- 2015 **Co-Organizer**, Research Brown Bag Meeting hosted by GIS, Health and Hazards Lab and HPCGIS Lab, Kent State University, Spring 2015
- 2015 - 2016 **Delegate**, University Consortium for Geographic Information Science (UCGIS) for Kent State University, Kent State University
- 2014 - 2015 **Chair**, Cyberinfrastructure Specialty Group (CISG), Association of American Geographers

- 2014 **Co-Organizer**, Multiple sessions on High-performance Geospatial Computing and CyberGIS, *The Association of American Geographers 110<sup>th</sup> Annual Meeting*, Tampa, FL, March 8-12, 2014
- 2013 - 2014 **Vice-Chair**, Cyberinfrastructure Specialty Group (CISG), Association of American Geographers
- 2013 **Co-Organizer**, The Session on High-performance and Large-scale Geospatial Computing, *The Association of American Geographers 109<sup>th</sup> Annual Meeting*, Los Angeles, CA, April 9-13, 2013
- 2010 - 2012 **Graduate Advisor**, Campus GIS Group, University of Illinois at Urbana-Champaign
- 2012 **Co-Organizer**, The Session on Computational Geography, *The Association of American Geographers 108<sup>th</sup> Annual Meeting*, New York, NY, February 24-28, 2012
- 2011 **Co-Organizer**, The Session on Computational Geography, *The Association of American Geographers 107<sup>th</sup> Annual Meeting*, Seattle, WA, April 12-16, 2011
- 2011 (Spring) **Organizer**, Geographic Information Science/Systems Colloquium Series, University of Illinois at Urbana-Champaign
- 2011 - 2012 **Board of Directors (Student)**, Cyberinfrastructure Specialty Group, Association of American Geographers
- 2010 - Present **Vice-Chair**, High Performance Computing Committee in Cyberinfrastructure Specialty Group, Association of American Geographers
- 2008 - 2009 **Treasurer**, Geography Graduate Student Association, University of Illinois at Urbana-Champaign

### Program and Other Committees

- 2018 - CLA Assembly Member, College of Liberal Arts, University of Minnesota
- 2017 Science Committee, Agent-Based Modeling (ABM) 17: A Symposium That Advances the Science of ABM (ABM17), San Diego, CA, April 20-22, 2017
- 2016 Program Committee, Third International Conference on CyberGIS and Geospatial Data Science (CyberGIS16), Urbana, IL, July 26-28, 2016
- 2016 Program Committee, CyberGIS Curriculum Workshop for Synthesizing Education Materials, San Francisco, CA, April 2-3, 2016
- 2015 Selection Committee, XSEDE Campus Champion Fellows (2015-2016)
- 2015 Judging Panel, Robert Raskin CyberGIS Student Competition, AAG Annual Meeting
- 2015 Judging Panel, Beck Paper Award, Geography, Kent State University
- 2014 - 2016 Program Committee, Masters of GIScience Online Degree Program, Kent State University

### Reviewer

- 2018 - Present Journal, *The Canadian Geographer*
- 2018 Conference, *SciDataCon 2018*

2018	Textbook, Springer
2017 - Present	Journal, <i>Computers and Geosciences</i>
2016 - Present	Journal, <i>Computers, Environment and Urban Systems</i>
2016 - Present	Journal, <i>Cartography and Geographic Information Science</i>
2014 - Present	Journal, <i>Transactions in GIS</i>
2013 - Present	Journal, <i>International Journal of Geographical Information Science</i>
2015	Book Chapter, <i>Encyclopedia of GIS, 2nd Edition</i> (Springer)
2015	Review Panel, National Science Foundation
2014	Conference, <i>The Second International Conference on CyberGIS and Geodesign</i>
2014	Conference, <i>International Conference on Information Systems for Crisis Response and Management</i>
2014	Textbook, SAGE

### **Volunteer, Outreach, and Training Experience**

March 22, 2018	<b>Organizer</b> , Mapping Party (Citizen Science event using OpenStreetMap), Research Collaborative Studio, Wilson Library, University of Minnesota
2016 -	<b>Domain Champion for GIS</b> serving as a liaison between cyberinfrastructure and GIScience communities, Extreme Science and Engineering Discovery Environment (XSEDE)
2013 - 2016	<b>Campus Champion</b> for Kent State University serving as a local source of cyberinfrastructure and high-performance computing information, Extreme Science and Engineering Discovery Environment (XSEDE)
2010	<b>GIS Technician</b> , GIS Fair, University of Illinois at Urbana-Champaign
2009	<b>Student Volunteer</b> , The National Science Foundation TeraGrid Annual Conference (TeraGrid'09)
2006	<b>Technical Assistant</b> for Grid interoperability testing between the Open Science Grid and NorduGrid, Lund University, Sweden, November, 2006
2005	<b>Student Volunteer</b> , StorCloud team, The 2005 ACM/IEEE Conference on Supercomputing (SC 05)
2004	<b>Student Volunteer</b> , StorCloud team, The 2004 ACM/IEEE Conference on Supercomputing (SC 04)
2003	<b>Student Volunteer</b> , The 2003 ACM/IEEE Conference on Supercomputing (SC 03)

## Selected Research Projects

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- 2018 **Hour of Cyberinfrastructure (Hour of CI)**, University of Minnesota  
The NSF-supported Hour of Cyberinfrastructure project is developing 17 hour-long interactive lessons to help participants achieve Cyber Literacy for GIScience, which is composed of eight core knowledge areas. Hour of CI Lessons include a gateway lesson (Welcome to the World of Cyberinfrastructure) and a beginner and intermediate lesson for each knowledge area. The lessons will be hosted on the GISandbox science gateway.
- 2017 **GISandbox**, University of Minnesota  
The GISandbox is a science gateway for geospatial computing. It was designed as a play place for researchers and educators to learn about, experiment with, and advance geographic information science. It is based on a Jupyter Notebook interface and has several innovative features to lower the barrier to entry to geospatial computing. It is available at: <http://gisandbox.org>.
- 2016 **ForEST Programming Language**, University of Minnesota  
ForEST is a programming language For Expressing Spatial-Temporal computation in parallel. ForEST builds on key/value programming models such as MapReduce by using space-time as keys and spatialtemporal data as values. It supports several common workflow patterns including Sequence, Split, Merge, and Synchronization that are easily expressed using declarative parallelism. A prototype was released as open-source software at: <https://github.com/eshook/forest>.
- 2014 **Social-Environmental Data Explorer (SEDE)**, HPCGIS Lab, Kent State University  
The Social-Environmental Data Explorer (SEDE) is designed as a social-media enhanced decision support system. It gathers streaming social media and environmental data, pre-processes the streaming data, and organizes the data to support interactive queries. SEDE gathers millions of Twitter messages each day and currently stores more than 4 billion tweets. SEDE is being used to advance risk-related research in the social media era.
- 2014 **Spatial Video Geonarrative Web Application**, HPCGIS Lab, Kent State University  
The Spatial Video Geonarrative Web Application is designed to transform a transcribed audio narrative into a set of spatially explicit points that can be manipulated using a GIS. This is achieved by accepting 1) an audio transcript of a geonarrative and 2) a GPS path collected from a spatial video camera. The time when each word was spoken is aligned with the GPS path, which allows the application to map each word to a location. The locations of each word can be input into a GIS such as ArcGIS.
- 2013 **Parallel Cartographic Modeling Language**, HPCGIS Lab, Kent State University  
The parallel cartographic modeling language (PCML) is a multi-institutional collaborative project aiming to create a computing language for cyberGIScientists that is designed for (1) usability, (2) programmability, and (3) scalability. PCML provides multi-core parallel processing for spatial operations while hiding the implementation complexities of parallelism. It was released as open-source software at: <https://github.com/HPCGISLab/pcml>

- 2013 **NetLogo ABM Workflow System (NAWS)**, HPCGIS Lab, Kent State University  
The NetLogo ABM Workflow System (NAWS) automatically decomposes large NetLogo ABM experiments defined using BehaviorSpace into multiple sub-experiments and executes them in parallel using one or more nodes. It was released as open-source software at: <https://github.com/HPCGISLab/naws>
- 2012 **Emotional Heatmaps**, CIGI, University of Illinois at Urbana-Champaign  
Technical lead in adapting multiple spatial analysis methods to create “emotional heatmaps” that capture spatial distributions of emotion from social media data. We created emotional heatmaps based on the English edition of Wikipedia and Twitter capturing textual views on armed conflict, the 2012 US presidential election, and Hurricane Sandy (2012). This work was also part of a collaborative effort with SGI, a leader in high-performance computing, to showcase their latest UV2 supercomputer by producing emotional heatmaps of Twitter every 5 seconds in near real-time (see <http://www.sgi.com/go/twitter/>).
- 2010 **IMap**, GIS Group, University of Illinois at Urbana-Champaign  
Advised undergraduate students in the creation of an online website called IMap to route students, visitors, and faculty from building to building using sidewalks on campus. Students collected locations of sidewalk intersections and doorways using GPS devices and developed the interactive GIS website that calculates least-cost paths between buildings. IMap can reconfigure routes for students with disabilities, using only accessible doorways while avoiding stairs and other obstacles. Students created two posters, presented a lightning talk, and gained valuable real-world GIS experience.
- 2009 **Parallel Agent-based Models**, CIGI, University of Illinois at Urbana-Champaign  
Led the design and development of several parallel agent-based models including theoretical models and frameworks such as boids model, active walker model, and Sugarscape, and realistic models such as for simulating influenza-like diseases spreading across the United States.
- 2007 **CyberGIS and GISolve Middleware**, CIGI, University of Illinois at Urbana-Champaign  
GISolve Toolkit represents cutting-edge geospatial middleware for empowering CyberGIS (see <http://gisolve.org>). Technical lead (design and development) for the GISolve Job Management System that handles the execution of every analysis or model in GISolve. Technical lead for developing an agent-based model, interpolation method, emotional heatmap method, and interactive interface for a viewshed method. Combined, these models and methods were used in numerous hands-on tutorials and cited in several publications.
- 2007 **Spatiotemporal Data Synthesis**, CIGI, University of Illinois at Urbana-Champaign  
This collaborative project synthesized climate and crop data for the period of 1900-2007 nationwide to enable the analysis of biomass-based bioenergy crops. The synthesis results were made available through a spatial-temporal data portal in GISolve. Lead developer for the data synthesis and data portal creation.
- 2006 **Modular Information Provider (MIP)**, GROW, The University of Iowa  
The Modular Information Provider (MIP) manages and automatically aggregates information sources for grid information services. It was developed at the Grid Research and education group @ ioWa (GROW) Lab. The Australian Partnership for Advanced Computing (APAC) Grid adopted MIP for production use. As a lead designer and developer of MIP, I contributed to three publications including a book chapter.

## Technical Skills

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### Software Development

C, C++, Python, Perl, MPI, OpenMP, CUDA, Map-Reduce, R, TensorFlow

### Web programming

D3.js, PHP, HTML, CSS, JavaScript, Google Maps, OpenLayers

### Database

MySQL, PostgreSQL, PostGIS

### Software

ArcGIS, Quantum GIS, GRASS, GDAL, Many Python-based GIS packages

## Media and News Coverage

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- 2018 Geography News, “GES Faculty Member Receives NSF”, August 20, 2018, <https://cla.umn.edu/geography/news-events/news/ges-faculty-member-receives-nsf>
- 2017 Esri News, “Did You Know? Latest Contributions of Esri R&D and ArcGIS to Science”, December 13, 2017, <https://community.esri.com/groups/sciences/blog/2017/12/14/did-you-know-dyk-latest-contributions-of-esri-rd-and-arcgis-to-science>
- 2017 CLA News, “Bringing Depth to Big Data”, October 6, 2017, <https://cla.umn.edu/news-events/story/bringing-depth-big-data>
- 2017 CLA News, “Superpowered GIS”, October 6, 2017, <https://cla.umn.edu/news-events/story/superpowered-gis>
- 2017 MGIS News, “Using Big Data to Address Big Challenges”, March 2, 2017, <https://cla.umn.edu/mgis/news-events/story/using-big-data-address-big-challenges>
- 2015 HPCWire, “XSEDE Resources Fuel Investigation of Model Human Origins”, August 20, 2015, <http://www.hpcwire.com/2015/08/20/xsede-resources-fuel-investigation-of-model-human-origins>
- 2015 Kent News, “Kent State Researchers Identify Clusters of Akron Neighborhoods with High Lead Levels”, August 14, 2015, <http://www.kent.edu/kent/news/kent-state-researchers-identify-clusters-akron-neighborhoods-high-lead-levels>
- 2015 XSEDE15 News, “XSEDE15 Awards Winners”, August 1, 2015, <https://conferences.xsede.org/xsede15/technical-program/awards-winners>
- 2015 XSEDE News, “A Catalyst for Complexity: XSEDE Programs Help Archeologists Master HPC, Model Human Origins”, April 22, 2015, <https://www.xsede.org/a-catalyst-for-complexity>
- 2015 Focus on Research (Eric Shook), Kent State University, February 23, 2015 <https://www.youtube.com/watch?v=W7C56qJiJgs&feature=youtu.be>
- 2015 WAKR 1590, “Tweeting Ebola”, February 12, 2015, <http://wokr.net/news/item/158218-tweeting-ebola>
- 2015 Segue Technologies, “Tracking #Ebola on Twitter”, February 5, 2015, <http://www.seguetech.com/blog/2015/02/05/tracking-ebola-twitter>

- 2015 Akron Beacon Journal, “Kent State researchers studying Ebola tweets”, January 31, 2015, <http://www.ohio.com/news/local/kent-state-researchers-studying-ebola-tweets-1.563247>
- 2015 Crain’s Cleveland Business, “Reporters’ Notebook: Jan. 26, 2015: Kent State looks at how Twitter perception becomes reality”, January 25, 2015, <http://www.crainscleveland.com/article/20150125/SUB1/301259988/reporters-notebook-jan-26-2015>
- 2015 Cleveland.com, “Tweets during 2014 Ebola scare to be studied by Kent State University researchers”, January 21, 2015, [http://www.cleveland.com/metro/index.ssf/2015/01/tweets\\_last\\_years\\_ebola\\_scareduring.html](http://www.cleveland.com/metro/index.ssf/2015/01/tweets_last_years_ebola_scareduring.html)
- 2015 Kent News, “Kent State Researchers Look to Twitter for Responses to Ebola Scare”, January 21, 2015, <https://www.kent.edu/kent/news/kent-state-researchers-look-twitter-responses-ebola-scare>
- 2014 KentWired, “Survey researches reaction to Ebola virus”, November 17, 2014, [http://www.kentwired.com/latest\\_updates/article\\_29348428-6ebf-11e4-a59c-cbefcc0528d0.html](http://www.kentwired.com/latest_updates/article_29348428-6ebf-11e4-a59c-cbefcc0528d0.html)
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- 2012 Huffington Post, “SGI Twitter Heat Map: Supercomputer Shows Where Angriest Tweeters Live” November 19, 2012, [http://www.huffingtonpost.com/2012/11/19/sgi-twitter-heat-map\\_n\\_2138726.html?ir=Technology](http://www.huffingtonpost.com/2012/11/19/sgi-twitter-heat-map_n_2138726.html?ir=Technology)
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