Curriculum Vitae - Anand Padmanabhan

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Research and Teaching Interests

- Advanced cyberinfrastructure and cyberGIS
- Geospatial data science and big data
- Geographic information systems and science (GIS)
- High performance, data-intensive and cloud computing
- Parallel and distributed systems

Education

Ph.D.	The University of Iowa, USA, December 2006 Computer Science
M.S.	The University of Iowa, USA, May 2003 Computer Science (Systems and Networks)
B.E.	University of Mumbai, Mumbai, India, June 2000 Computer Engineering

Professional Experience

2014 - Present	Senior Research Scientist Department of Geography and Geographic Information Science, UIUC
2013 - Present	Faculty Affiliate Illinois Informatics Institute, UIUC
2012 - Present	Center Affiliate National Center for Supercomputing Application (NCSA), UIUC
2007 - 2014	Research Scientist Department of Geography and Geographic Information Science, UIUC
2006 - 2007	Assistant Research Scientist Academic Technologies - Research Services of Information Technology Services, The University of Iowa
2003 - 2006	Research Assistant Academic Technologies - Research Services of Information Technology Services, The University of Iowa

2002	Software Developer (Internship) UBS Warburg
2001	Software Design Engineer in Test (Internship) Microsoft
2000-2002	Teaching Assistant Department of Computer Science, The University of Iowa

Teaching Experience

2020 (Spring)	Advanced Topics in GIS: Foundations of CyberGIS and Geospatial Data Science (GEOG 479) (Role: Co-Instructor) Department of Geography and Geographic Information Science, UIUC
2019-2020	Online Course Development: Foundations of CyberGIS and Geospatial Data Science (Role: Co-Developer) Department of Geography and Geographic Information Science, UIUC
2019 (Summer)	Geospatial Analytics for Natural Hazards at Scale Based on CyberGIS-Jupyter (Role: Instructor) Summer Program for Students from Zhejiang University, Global Education and Training, Illinois International Programs
2018 (Fall)	Advanced Topics in GIS: CyberGIS (GEOG 479) (Role: Full Course Responsibility) Department of Geography and Geographic Information Science, UIUC
2017 (Fall)	Advanced Topics in GIS: CyberGIS (GEOG 479) (Role: Full Course Responsibility) Department of Geography and Geographic Information Science, UIUC
2016 (Fall)	Principles of Geographic Information Systems (GEOG 480) (Role: Guest Instructor) Department of Geography and Geographic Information Science, UIUC
2014 (Fall)	Principles of Geographic Information Systems (GEOG 480) (Role: Full Course Responsibility) Department of Geography and Geographic Information Science, UIUC
2013 (Fall)	Principles of Geographic Information Systems (GEOG 480) (Role: Guest Instructor) Department of Geography and Geographic Information Science, UIUC
2010 (Spring)	Principles of Geographic Information Systems (GEOG 480) (Role: Guest Instructor) Department of Geography and Geographic Information Science, UIUC
2009 (Spring)	Principles of Geographic Information Systems (GEOG 480) (Role: Guest Instructor) Department of Geography and Geographic Information Science, UIUC
2003 (Spring)	Autonomous Agents and Multi-Agent Systems (Graduate Course) (Role: Teaching Assistant) Department of Electrical and Computer Engineering, The University of Iowa
2002 (Fall)	Software Engineering Foundations (Graduate Course) (Role: Teaching Assistant)

Department of Computer Science, The University of Iowa

2002 (Spring)	Object-Oriented Software Development (Undergrad course) (Role: Teaching Assistant, Leading Discussion and Labs) Department of Computer Science, The University of Iowa
2001 (Fall)	Programming Language Foundations (Graduate course) (Role: Teaching Assistant, Leading Discussion) Department of Computer Science, The University of Iowa
2001 (Spring)	Object-Oriented Software Development (Undergrad course) (Role: Teaching Assistant, Leading Discussion and Labs) Department of Computer Science, The University of Iowa
2000 (Fall)	Introduction to Computer Programming (Undergrad course) (Role: Teaching Assistant, Leading Discussion and Labs) Department of Computer Science, The University of Iowa

Research Grants

2018-21	**PI**, NSF Collaborative Research: CyberTraining: CIU: Hour of Cyberinfrastructure: Developing Cyber Literacy for Geographic Information Science. ($22,375)
2018-20	**Co-PI**, Illinois EPA: Resource Management Mapping Service (RMMS) Maintenance and Enhancement ($210,201) with PI: Shaowen Wang
2017-20	**Senior Personnel**, NSF INFEWS/T4: The INFEWS-ER: a Virtual Resource Center Enabling Graduate Innovations at the Nexus of Food, Energy, and Water Systems ($1,000,000) with PI: Luis Rodriguez
2017-18	**Co-PI**, USDA: A Workshop to Plan an International Cyber-infrastructure for On-farm Production Research ($50,000) with PI: David Bullock
2014-18	**Co-PI**, NSF CIF21 DIBBs: Scalable Capabilities for Spatial Data Synthesis ($1,499,998) with PI: Shaowen Wang and Co-PI: Katarzyna Keahey
2014-18	**Senior Personnel**, NSF MRI: Acquisition of a National CyberGIS Facility for Computing and Data-Intensive Geospatial Research and Education ($2,553,335) with PI: Shaowen Wang
2013-16	**Co-PI**, Illinois EPA: Resource Management Mapping Service (RMMS) Maintenance and Enhancement II ($310,000) with PI: Shaowen Wang
2013-14	**Co-PI**, NSF XSEDE Supercomputing Resource Award: Extending and Sustaining CyberGIS Discovery Environment (9.35M SUs (Service Units) - one service unit is equivalent to one normalized computing hour) with PI: Shaowen Wang and Co-PIs: Yan Liu and Wenwu Tang
2012-13	**Co-PI**, NSF XSEDE Supercomputing Resource Award: Extending the CyberGIS Discovery Environment (5.58M SUs) with PI: Shaowen Wang and Co-PIs: Yan Liu and Wenwu Tang
2011-12	**Co-PI**, NSF TeraGrid Supercomputing Resource Award: Establishing the CyberGIS Gateway (3.1M SUs) with PI: Shaowen Wang and Co-PIs: Yan Liu and Wenwu Tang
2010-11	**Co-PI**, NSF TeraGrid Supercomputing Resource Award: Extending and Sustaining GISolve as a GIScience Gateway Toolkit for Geographic Information Analysis (1.2M SUs) with PI: Shaowen Wang and Co-PIs: Yan Liu and Wenwu Tang

Publications

Journal Publications

1. Rodrguez, L. F., Marshall, A.-M., Cotton, D., Koelsch, R., Koziel, J., Meyer, D., Steward, D., Heemstra, J., **Padmanabhan, A.**, Classen, J., Meyer N. J., Ruddell B. L., Ryan S.M., Cai, X., Habib, E., and Saundry P. D. (2019) "The Development of the INFEWS-ER: A Virtual Resource Center for Transdisciplinary Graduate Student Training at the Nexus of Food, Energy, and Water". *Frontiers in Environmental Science*, 7. DOI: 10.3389/fenvs.2019.00038

2. Yin, D., Liu, Y., Hu, H., Terstriep, J., Hong, X., **Padmanabhan, A.**, and Wang, S. (2018) "CyberGIS-Jupyter for Reproducible and Scalable Geospatial Analytics". *Concurrency and Computation: Practice and Experience*, https://doi.org/10.1002/cpe.5040

3. Gao, Y., Wang, S., **Padmanabhan, A.**, Yin, J., and Cao, G. (2018) "Mapping Spatiotemporal Patterns of Events Using Social Media: A Case Study of Influenza Trends". *International Journal of Geographical Information Science (IJGIS)*, 32(3): 425-449

4. Soliman, A., Soltani, K., Yin, J., **Padmanabhan, A.**, and Wang, S. (2017) "Social Sensing of Urban Land Use Based on Analysis of Twitter Users' Mobility Patterns". *PLOS ONE*, 12(7): e0181657, DOI: 10.1371/journal.pone.0181657

5. Wang, S., Liu, Y., and **Padmanabhan, A**. (2016) "Open CyberGIS Software for Geospatial Research and Education in the Big Data Era". *SoftwareX*, 5: 1-5, DOI: 10.1016/j.softx.2015.10.003

6. Cao, G., Wang, S., Hwang, M., **Padmanabhan, A.**, Zhang, Z., and Soltani, K. (2015) "A Scalable Framework for Spatiotemporal Analysis of Locationbased Social Media Data". *Computers, Environment and Urban Systems*, 51: 70-82

7. Liu, Y.Y., **Padmanabhan, A.**, and Wang, S. (2015) "CyberGIS Gateway for Enabling Data-Rich Geospatial Research and Education". *Concurrency and Computation: Practice and Experience*, 27(2): 395-407, DOI:10.1002/cpe.3256

8. **Padmanabhan, A.**, Wang, S., Cao, G., Hwang, M., Zhang, Z., Gao, Y., Soltani, K., and Liu, Y.Y. (2014) "FluMapper: A CyberGIS Application for Interactive Analysis of Massive Location-based Social Media". *Concurrency and Computation: Practice and Experience*, 26(13): 2253-2265, DOI: 10.1002/cpe.3287

9. 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.v18 i5.4366

10. Zhao, Y., **Padmanabhan, A.**, Wang, S. (2013) "A Parallel Computing Approach to Viewshed Analysis of Large Terrain Data Using Graphics Processing Units". *IJGIS*, 27(2): 363-384

11. **Padmanabhan, A.**, Ghosh, S., and Wang, S. (2010) "A Self-Organized Grouping (SOG) Method for Efficient Grid Resource Discovery". *Journal of Grid Computing*, 8(3): 365-389

12. Williams, A., **Padmanabhan, A.**, and Blake, B. (2005) "Experimentation with Local Consensus Ontologies with Implications for Automated Service Composition." *IEEE Transactions on Knowledge and Data Engineering*, 17(7): 969-981

Edited Proceedings

13. Wang,S., Wilkins-Diehr, N., **Padmanabhan, A.**, Shi, X., and Vatsavai, R.R. (2011). "*Proceedings of the 2nd ACM SIGSPATIAL International Workshop on High Performance and Distributed Geographic Information Systems (ACM SIGSPATIAL HPDGIS 2011)*". ACM Digital Library

14. Wang, S., Wilkins-Diehr, N., Shi, X., Vatsavai, R.R., Zhang, J., and **Padmanabhan, A**. (2010). "*Proceedings of the 1st ACM SIGSPATIAL International Workshop on High Performance and Distributed Geographic Information Systems (ACM SIGSPATIAL HPDGIS 2010)*". ACM Digital Library

Book Chapters

15. Wang, S., Lyu, F., Wang, S., Catlet, C.E., **Padmanabhan, A.**, and Soltani, K. (2020) "Integrating CyberGIS and Urban Sensing for Reproducible Streaming Analytics". In: *Urban Informatics*, edited by W. Shi, M.F. Goodchild, M. Batty, and M.-P. Kwan, Springer, Heidelberg, Germany, accepted

16. Finn, M.P., Liu, Y., Mattli, D. M., Behzad, B., Yamamoto, K. H., Shook, E., **Padmanabhan, A.**, Stramel, M., and Wang, S. (2018) "High-Performance Small-Scale Raster Map Projection Empowered by Cyberinfrastructure". In: *CyberGIS for Geospatial Innovation and Discovery*, edited by S. Wang and M.F. Goodchild, Springer,"Dordrecht, Netherlands, pages: 171-188

17. Wang, S., Hu, H., Lin, T., Liu, Y., **Padmanabhan, A.**, and Soltani, K. (2014) "CyberGIS for Data-Intensive Knowledge Discovery". *ACM SIGSPATIAL Newsletter*, 6(2): 26-33

18. Wang, S., Cao, G., Zhang, Z., Zhao, Y., **Padmanabhan, A.**, and Wu, K. (2013) "A CyberGIS Environment for Analysis of Location-Based Social Media Data". In: *Location-Based Computing and Services, 2nd Edition* edited by A.K. Hassan and H. Amin, CRC Press, pages: 187-205

19. **Padmanabhan, A.**, Shook, E., Liu, Y., and Wang, S. (2010) "An Interoperable Information Service Solution for Grids". In: *Cyberinfrastructure Technologies and Applications* edited by J. Cao, Nova Science Publishers, Inc

Peer-Reviewed Conference Proceedings

20. **Padmanabhan, A.**, Yin, D., Lyu, F., and Wang, S. "Bridging Local Cyberinfrastructure and XSEDE with CyberGIS-Jupyter". In: *Proceedings of Practice and Experience in Advanced Research Computing (PEARC19)*, Chicago, IL, USA, July 28 - August 1, 2019

21. Lyu, F., Yin, D., **Padmanabhan, A.**, Choi, Y., Goodall, J. L., Castronova, A., Tarboton, D., and Wang, S. "Bridging Reproducible Hydrological Modeling with CyberGIS-Jupyter: A Case Study on SUMMA". In: *Proceedings of Practice and Experience in Advanced Research Computing (PEARC19)*, Chicago, IL, USA, July 28 - August 1, 2019

22. Yin, D., Liu, Y., **Padmanabhan, A.**, Terstriep, J., Rush, J., and Wang, S. "A CyberGIS-Jupyter Framework for Geospatial Analytics at Scale". In: *Proceedings of the 2017 Practice and Experience in Advanced Research Computing (PEARC'17)*, New Orleans, Louisiana, USA, July 9 - 13, 2017

23. Soltani, K., **Padmanabhan, A.**, Liu, Y., Wang, S. "Fast Indexing of Spatial Objects Using GeoHash". In: *Proceedings of the Third International Conference on CyberGIS and Geospatial Data Science*, Urbana, Illinois, July 26-28, 2016

24. Soliman, S., Soltani, K., **Padmanabhan, A.**, and Wang, S. "Consistency of Social Sensing Signatures Across Major US Cities". In: *Proceedings of the Third International Conference on CyberGIS and Geospatial Data Science*, Urbana, Illinois, July 26-28, 2016

25. Soltani, K., Soliman, A., **Padmanabhan, A.**, and Wang, S. "UrbanFlow: Large-scale Framework to Integrate Social Media and Authoritative Landuse Maps". In: *Proceedings of the 2016 Annual Conference on Extreme Science and Engineering Discovery Environment (XSEDE'16)*, Miami, Florida, USA, July 17 - 21, 2016

26. Soliman, A., Yin, J., Soltani, K., **Padmanabhan, A.**, and Wang, S. "Where Chicagoans Tweet the Most: Semantic Analysis of Preferential Return Locations of Twitter Users". In: *Proceedings of the 1st ACM SIGSPATIAL International Workshop on Smart Cities and Urban Analytics (UrbanGIS'15)*, Seattle, Washington, USA, November 3, 2015

27. Soltani, K., **Padmanabhan, A.**, and Wang, S. "MovePattern: Interactive Framework to Provide Scalable Visualization of Movement Patterns". In: *Proceedings of the 8th ACM SIGSPATIAL International Workshop on Computational Transportation Science (IWCTS)*, Seattle, Washington, USA, November 3, 2015

28. Youn, C., Nandigam, V., Phan, M., Tarboton, D., Wilkins-Diehr, N., Baru, C., Crosby, C., **Padmanabhan, A.**, and Wang, S. "Leveraging XSEDE HPC resources to address computational challenges with high-resolution topography data". In: *Proceedings of the NSF Extreme Science and Engineering Discovery Environment 2014 (NSF XSEDE'14)*, Atlanta, GA, July 13-18, 2014

29. Zhang, Z., Wang, S., Cao, G., **Padmanabhan, A.**, Wu, K. "A Scalable Approach to Extracting Mobility Patterns from Social Media Data". In: *Proceedings of the 22nd International Conference on GeoInformatics*, Kaohsiung, Taiwan, June 25-27, 2014

30. **Padmanabhan, A.**, Altunay, M., and Hill, K. "Assessing Traceability of User Jobs in Absence of End User Certificates in GlideinWMS Framework". In: *Procesings of the International Symposium on Grids and Clouds (ISGC) 2014*, Taipei, Taiwan March 23-28, 2014

31. Riteau, P., Hwang, M., **Padmanabhan, A.**, Gao, Y., Liu, Y.Y., Keahey, K., Wang, S. "A Cloud Computing Approach to On-Demand and Scalable CyberGIS Analytics". In: *ScienceCloud 2014*, Vancouver, BC, Canada, June 23, 2014

32. Hwang, M., Wang, S., Cao, G., **Padmanabhan, A.**, and Zhang, Z. "Spatiotemporal Transformation of Social Media Geostreams: A Case Study of Twitter for Flu Risk Analysis". In: *Proceedings of the 4th ACM SIGSPATIAL International Workshop on GeoStreaming (IWGS)*, Orlando, Florida, USA, November 5 2013

33. Liu, Y., **Padmanabhan, A.**, and Wang, S. "CyberGIS Gateway for Enabling Data-Rich Geospatial Research and Education". In: *Proceedings of Science Gateway Institute Workshop (IEEE Cluster 2013)*, Indianapolis, Indiana, USA, September 27, 2013

34. **Padmanabhan, A.**, Wang, S., Cao, G., Hwang, M., Zhao, Y., Zhang, Z., and Gao, Y. "FluMapper: An Interactive CyberGIS Environment for Massive Location-based Social Media Data Analysis". In *Proceedings of NSF XSEDE 2013: Extreme Science and Engineering Discovery Environment: Gateway to Discovery*, San Diego, CA, USA, Jul 22-25 2013

35. **Padmanabhan, A.**, Youn, C., Hwang, M., Liu, Y., Wang, S., Wilkins-Diehr, N., and Crosby, C. "Integration of Science Gateways: A Case Study with CyberGIS and Open-Topography". In *Proceedings of NSF XSEDE 2013: Extreme Science and Engineering Discovery Environment: Gateway to Discovery*, San Diego, CA, USA, Jul 22-25 2013

36. Shook, E., Leetaru, K., Cao, G., **Padmanabhan, A.** and Wang, S. "Happy or Not: Generating Topic-based Emotional Heatmaps for Culturomics using CyberGIS". In: *Proceedings of the 8th IEEE International Conference on eScience 2012*, Chicago, IL, October 8, 2012

37. Behzad, B., **Padmanabhan, A.**, Liu, Y., and Wang, S. "Integrating CyberGIS Gateway with Windows Azure: A Case Study on MODFLOW Groundwater Simulation". In: *Proceedings of the ACM SIGSPATIAL Second International Workshop on High Performance and Distributed Geographic Information Systems (ACM HPDGIS 2011)*, Chicago, IL, USA, November 1, 2011

38. **Padmanabhan, A.**, Wang, S., and Navarro, J.P. "A CyberGIS gateway approach to interoperable access to the National Science Foundation TeraGrid and the Open Science Grid". In: *Proceedings of the 5th NSF TeraGrid 2011 Conference: Extreme Digital Discovery*, Salt Lake City, UT, July 18-21, 2011

39. Zhao, Y., **Padmanabhan, A.**, Wang, S., and Liu, Y. "GPGPU-Based Parallel Viewshed Analysis on CyberGIS Gateway". In: *Proceedings of the 5th NSF TeraGrid 2011 Conference: Extreme Digital Discovery*, Salt Lake City, UT, July 18-21, 2011

40. **Padmanabhan, A.** and Wang, S. "A Distributed Resource Broker for Spatial Middleware Using Adaptive Space-Filling Curve". In *Proceedings of the ACM SIGSPATIAL International Workshop on High Performance and Distributed Geographic Information Systems (ACM HPDGIS 2010)*, San Jose, CA, USA, November 2, 2010

41. **Padmanabhan, A.**, Tang, W., and Wang, S. "Agent-based Modeling of Agricultural Land Use on TeraGrid". In *Proceedings of the 4th NSF TeraGrid 2010 Conference*, Pittsburgh, PA, USA, August 1-5, 2010

42. Wang, S., **Padmanabhan, A.**, Myers, J.D., Tang, W., and Liu, Y. "Towards Provenance-aware Geographic Information Systems". In *Proceedings of 16th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM GIS 2008)*, Irvine, CA, USA, November 5-7, 2008

43. Wang, S., Shook, E., Briggs, R., **Padmanabhan, A.,** and Hansen, T. "Modular Information Provider: A Grid-Independent Approach". In *Proceedings of the NSF TeraGrid 2007 Conferance*, Madison, WI, USA, June 2007

44. **Padmanabhan, A**. "SOG: A Self-Organized Grouping Infrastructure for Grid Resource Discovery". In *EDAA/DATE (Design Automation Test in Europe) Ph.D. Forum*, Acropolis, Nice, France, April 16-20, 2007

45. Wang, S., Shook, E., **Padmanabhan, A.**, Briggs, R., and Pearlman, L. "Developing the Modular Information Provider (MIP) to Support Interoperable Grid Information Services". In *Proceeding of 5th International Workshop of Grid and Cooperative Computing (GCC2006)*, Hunan, China, October 21-23 2006

46. 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". In *NSF TeraGrid 2006*, Indianapolis, IN, USA, June 2006

47. **Padmanabhan, A.**, Wang, S., Ghosh, S., and Briggs, R. "A Self-Organized Grouping (SOG) Method for Efficient Grid Resource Discovery". In *Proceedings of Grid 2005 Workshop (in conjunction with Supercomputing 2005 Conference)*, Seattle, WA, USA, November 13-14 2005

48. Wang, S., **Padmanabhan, A.**, Liu, Y., Briggs, R., Ni, J., He, T., Knosp, B., and Onel, Y. "A Multi-Agent System Architecture for End-User Level Grid Monitoring Using Geographic Information Systems (MAGGIS): Architecture and Implementation". In *Proceedings of 2nd International Workshop of Grid and Cooperative Computing (GCC2003)*, Shanghai, China, December 7-10, 2003, Lecture Notes in Computer Science, LNCS vol. 3032, pp. 536-543

49. Williams, A., **Padmanabhan, A.,** and Blake, B. "Local Consensus Ontologies for B2B-Oriented Service Discovery". In *Proceedings of Second International Joint Conference on Autonomous Agents and Multi-Agent Systems*, Melbourne, Australia, July 2003

Selected Conferance Abstracts and Other Publications

50. Koelsch, R., Rodriguez, L. F., Banner, S., Classen, J., Cotton, D., Deviney, A., Heemstra, J., Koziel, J., Meyer, D., Marshall, A.-M., **Padmanabhan, A.**, and Steward, D. (2019) "Lessons Learned by INFEWS-ERs virtual resource center for transdisciplinary graduate student training at the nexus of food, energy, and water". *The 2019 ASABE Annual International Meeting*, Paper Number 1900876, July 7-9, 2019, Boston, MA, USA DOI: 10.13031/aim.201900876

51. Vandewalle, B., Barley, W., Wang, S., and **Padmanabhan, A**. "Geospatial Software Institute Community Survey". *The American Association of Geographers Annual Meeting*, April 3-7, 2019, Washington, DC, USA

52. Yin, D., Liu, Y., Rush, J., Terstriep, J., **Padmanabhan, A.**, and Wang, S. "CyberGIS-Jupyter: Toward Reproducible Geospatial Analytics at Scale". *The American Association of Geographers Annual Meeting*, April 5-9, 2017, Boston, Massachusetts, USA

53. Soliman, A., **Padmanabhan, A.**, Keahey, K., Liu, Y., Pineda, L., Riteau, P., Soltani, K., Subramaniam, B., Yin, J., and Wang, S. "A Cloud Computing Workflow for Scalable Integration of Remote Sensing and Social Media Data in Urban Studies". *The American Geophysical Union Fall Meeting*, December 14-18, 2015, San Francisco, California, USA

54. Gao, Y., Wang, S., and **Padmanabhan, A**. "Mapping Spatiotemporal Patterns of Events: Social Media as an Indicator". *The Association of American Geographers 111st Annual Meeting*, April 21-25, 2015, Chicago, Illinois, USA

55. Jeong, M.-H., **Padmanabhan, A.**, and Wang, S. "Monitoring Radiation Level Changes with Surface Networks". *The Association of American Geographers 111st Annual Meeting*, April 21-25, 2015, Chicago, Illinois, USA

56. Rush, J., Wang, S., and **Padmanabhan, A**. "Re-conceptualizing Data in the CyberGIS Gateway". *The Association of American Geographers 111st Annual Meeting*, April 21-25, 2015, Chicago, Illinois, USA

57. Soltani, K., Wang, S., and **Padmanabhan, A**. "Mapping Spatiotemporal Diffusion of Ideas Using Hashtags". *The Association of American Geographers 111st Annual Meeting*, April 21-25, 2015, Chicago, Illinois, USA

58. Gao, Y., Wang, S., and **Padmanabhan, A**. "Spatiotemporal Event Detection Using Social Media Data". *The Association of American Geographers 110th Annual Meeting*, April 8-12, 2014, Tampa, Florida, USA

59. Zhao, Y., Wang, S., and **Padmanabhan, A**. "Spatial Strategies for Scalable Spatial Data Analysis on Heterogeneous Parallel Computing Architecture". *The Association of American Geographers 109th Annual Meeting*, April 9-13, 2013, Los Angeles, California, USA

60. Dong, D., Wang, S., **Padmanabhan, A.**, and White, C. "Assessing DesignOriented GIS Requirements: An Environment Management Case Study". *The Association of American Geographers 108th Annual Meeting*, February 24-28, 2012, New York City, New York, USA

61. Zhao, Y., **Padmanabhan, A.**, and Wang, S. "A Parallel Computing Approach to Detecting Spatiotemporal Patterns of Flu Cases Using Social Media Data". *The Association of American Geographers 108th Annual Meeting*, February 24-28, 2012, New York City, New York, USA

62. Zhao, Y., **Padmanabhan, A.**, Wang, S., and Liu, Y. "GPGPU-Based Parallel Viewshed Analysis on CyberGIS Gateway". *The 5th NSF TeraGrid 2011 Annual Conference*, July 18-21, 2011, Salt Lake City, Utah, USA

63. Zhao, Y., **Padmanabhan, A.**, and Wang, S. "A GPGPU-Based Parallel Algorithm for Viewshed Analysis". *The Association of American Geographers 107th Annual Meeting*, April 12-16, 2011, Seattle, Washington, USA

64. Wang, S., Tang, W., Bennett, D. A., and **Padmanabhan, A**. "An Open Science Grid Approach to Understanding the Complexity of Coupled Human and Natural Systems". *The 2009 Open Science Grid All Hands Meeting*, March 2-5, 2009, Baton Rouge, Louisiana, USA

65. Wang, S., Shook, E., **Padmanabhan, A.**, Briggs, R., and Likarish, P. 2006. "Open Science Grid Troubleshooting". *The 2006 ACM/IEEE Conference on Supercomputing (SC—06)*, November 11-17, 2006, Tampa, Florida, USA

66. **Padmanabhan, A.**, Ghosh, S., and Wang, S. "A Self-Organized Grouping (SOG) Method for Resource Discovery in Grids". *Technical Report 05-12*, Department of Computer Science, The University of Iowa, 2005

Thesis

67. "SOG: A Self-Organized Grouping Infrastructure for Grid Resource Discovery". **Anand Padmanabhan**. Advisors: Dr. Sukumar Ghosh, Dr. Shaowen Wang. *PhD Thesis*, Department of Computer Science, The University of Iowa, 2006

68. "Building local consensus ontologies via autonomous merging using a lexical database". **Anand Padmanabhan**. Advisors: Dr. Andrew Williams, Dr. Sukumar Ghosh. *MS Thesis*, Department of Computer Science, The University of Iowa, 2003

Selected Invited Talks and Presentations

1. **Anand Padmanabhan**. CyberGIS-Jupyter for Reproducible Geospatial Research and Education at Scale. Invited Guest Lecture at *INFEWS-ER Disaster Resiliency and Recovery Cohort Challenge*. Decemer 17, 2019, Online

2. **Anand Padmanabhan**. CyberGIS-Jupyter for Reproducible Geospatial Research and Education at Scale. *Location Powers: Data Science*. Novemver 13-14, 2019, Mountain View, CA

3. **Anand Padmanabhan**. Introduction to CyberGIS-Jupyter. *AAG UCGIS Summer School 2019*. July 8-12, 2019, Urbana, IL

4. **Anand Padmanabhan**. CyberGIS. *Array of Things User Workshop*, Aug 29-30, 2018, Chicago, IL

5. **Anand Padmanabhan**. Core-Technical Capabilities in CyberGIS. *The 2nd Workshop on National Geospatial Software Institute Conceptualization*. July 15-17, 2018, Chicago IL

6. **Anand Padmanabhan**. Geospatial Analytics Using HPC on ROGER - A Hands-on Session. *UCGIS Summer School*. May 15-20, 2017, Urbana, IL

7. **Anand Padmanabhan**. CyberGIS for Scalable Spatial Data Synthesis. *5th National Data Service Consortium Workshop*. April 4-6, 2016, RENCI, Chapel Hill, NC

8. **Anand Padmanabhan**. CyberGIS-FEW. *Midwest Big Data Hub All Hands Meeting*. March 21-22, 2016, Chicago, IL

9. **Anand Padmanabhan**. OSG Security Training - A Review of Policies and Procedures. *Open Science Grid All Hands Meeting 2016*, March 14-18,2016, Clemson, SC

10. **Anand Padmanabhan**, Yan Liu, and Shaowen Wang. GISolve Middleware: Integration with Advanced CyberInfrastructure. *The Second International Conference on CyberGIS and Geodesign (CyberGIS'14)*, Aug 19-21, 2014, Redlands, CA

11. **Anand Padmanabhan**, Shaowen Wang, Goufeng Cao, MyungHwa Hwang, Yanli Zhao, Zhenhua Zhang, and Yizhao Gao. FluMapper: An Interactive CyberGIS Environment for Massive Location-based Social Media Data Analysis. *NSF XSEDE 2013: Extreme Science and Engineering Discovery Environment: Gateway to Discovery*, Jul 22-25, 2013, San Diego, CA, USA

12. **Anand Padmanabhan**, Choonhan Youn, MyungHwa Hwang, Yan Liu, Shaowen Wang, Nancy Wilkins-Diehr, and Christopher Crosby. Integration of Science Gateways: A Case Study with CyberGIS and OpenTopography. *NSF XSEDE 2013: Extreme Science and Engineering Discovery Environment: Gateway to Discovery*, Jul 22-25, 2013, San Diego, CA, USA

13. **Anand Padmanabhan**, Shaowen Wang, and John-Paul Navarro. A CyberGIS gateway approach to interoperable access to the National Science Foundation TeraGrid and the Open Science Grid. *The 6th Annual NSF TeraGrid 2011 Conference: Extreme Digital Discovery*, July 2011, Salt Lake City, UT

14. **Anand Padmanabhan** and Shaowen Wang. A Distributed Resource Broker for Spatial Middleware Using Adaptive Space-Filling Curve. In *Proceedings of the ACM SIGSPATIAL International Workshop on High Performance and Distributed Geographic Information Systems (ACM HPDGIS 2010)*, Nov 2, 2010, San Jose, CA, USA

15. **Anand Padmanabhan**, Wenwu Tang and Shaowen Wang. Agent-based modeling of agricultural land use on TeraGrid. *The 5th Annual NSF TeraGrid Conference 2010*, Aug 2-5, 2010 Pittsburgh, PA

16. **Anand Padmanabhan**. Comparing ArcGIS and Open-source Solutions using Malaria Map Application. *Invited Lecture (Graduate class on Principles of GIS), Department of Geography, The University of Illinois at Urbana Champaign*, Apr 2010, Urbana, IL

17. **Anand Padmanabhan**. Pakiti: A Patching Status Monitoring Tool. *OSG All-Hands Meeting*, Mar 2010, Fermilab, Batavia, IL

18. **Anand Padmanabhan**, Shaowen Wang, Ian Brooks and Kathrine Tan. Malaria Map Application. *Conference of American Association of Blood Banks (AABB)*, Oct 2009, New Orleans, LA

19. **Anand Padmanabhan**, Shaowen Wang, Ian Brooks and Kathrine Tan. Malaria Map Application. *CDC Malaria Branch Meeting*, Sept 2009, Atlanta, GA

20. **Anand Padmanabhan**. Incident Response Forensics and Review OSG Security Drill. *OSG Site Administrators Workshop*, Aug 2009, Indianapolis, IN

21. **Anand Padmanabhan**. A Hands on Introduction to Open Source GIS Software (PostGIS, Geoserver and Openlayers). *Invited Lecture (Graduate class on Principles of GIS), Department of Geography, The University of Illinois at Urbana Champaign*, April 2009, Urbana, IL

22. **Anand Padmanabhan** and Jim Basney. Security Best Practices. *OSG All-Hands Meeting*, Mar 2008, Baton Rouge, LA

23. **Anand Padmanabhan**. Command Line Tool for Certificate Management. *OSG Site Administrators Meeting*, Nov 2008, Stanford Linear Accelerator Center (SLAC), Stanford, CA

24. **Anand Padmanabhan** and Shaowen Wang. OSG Troubleshooting: A User-Centric Perspective. *OSG User's Meeting*. June 2008, Brookhaven National Laboratory, Upton, NY

25. **Anand Padmanabhan** and Shaowen Wang. Logging and Troubleshooting - An OSG Perspective. *OSG Consortium All Hands Meeting*, March 2008, Chapel Hill, NC

26. **Anand Padmanabhan**. OSG Information Services - A Discussion. *OSG Site Administrators Meeting*. Dec 2007, Fermilab, IL

27. **Anand Padmanabhan**. An Introduction to Grid Computing. *Invited Lecture (Graduate class on peer-to-peer networks), Department of Computer Science, The University of Iowa*, March 2007, Iowa City, IA

28. **Anand Padmanabhan**, Shaowen Wang and Sukumar Ghosh. SOG: A Self-Organized Grouping Infrastructure for Grid Resource Discovery. *The University of Iowa Research Booth at IEEE/ACM Supercomputing Conference 2006 (IEEE/ACM SC2006)*, November 11-17, 2006 Tampa, FL

29. **Anand Padmanabhan** and Shaowen Wang. Using MonALISA Repository. *Open Science Grid (OSG) Operations and Support Center Meeting*, May 16-17, 2006 Indianapolis, IN

30. **Anand Padmanabhan** and Shaowen Wang. State of Generic Information Provider (GIP) in Open Science Grid (OSG). *Open Science Grid Integration Workshop*, Nov 30 - Dec 1, 2005, Fermilab, IL

31. **Anand Padmanabhan** and Shaowen Wang. Resource Discovery and Monitoring - Managing Grid Complexity for End Users. *The CMS UIowa Tier-2 Workshop*, July 22, 2004, Iowa City, IA

Patent

- Shaowen Wang, Yan Liu, **Anand Padmanabhan**. A High Performance, Distributed, and Collaborative CyberGIS Platform, disclosure filed

Selected Scientific Software Projects

- *ROGER (Resourcing Open Geospatial Education and Research).* Served as an Associate Director on an NSF Major Research Instrumentation grant to create and operate this firstever cyberGIS supercomputer through collaboration with a multidisciplinary and multi-institution team. ROGER was the first general-purpose supercomputer to seamlessly integrates high-performance computing, Graphic Processing Units (GPUs), data-intensive computing (based on Hadoop and Spark), and cloud computing (based on OpenStack), supporting scientists and users to flexibly take advantage of these computing modalities all connected by a large storage and fast network. ROGER has enabled broad and significant scientific advances in multidisciplinary, bio, engineering, geo, and social sciences.

- *GISolve Toolkit.* Participated as one of the core developer and architect of this cyberinfrastructure based GIS software, and have been leading the research and development of the software. GISolve has been deployed within multiple national and international cyberinfrastructure environments and used by numerous users from a broad range of fields (e.g., biology, computer science, geography, linguistics, public health, and statistics) for various cutting - edge research and education activities.

- *Security Probes for Open Science Grid - Resource and Service Validation (OSG-RSV).* I was the lead technical developer of the security probes for the OSG-RSV framework that are widely deployed both centrally and on every OSG site to monitor and validate the status the OSG security infrastructure.

- *Malaria Map Application.* Served as the technical lead and the primary developer of a project to design a web-based GIS (Geographic Information Systems) to manage and access Malaria data. This project presents world wide malaria endemicity information intelligently, and in a manner that is easily understood, through an interactive map, so as to be accessible to general audience of travelers as well as experts users like health professionals and blood-banks. This project was developed for the CDC's (Center for Disease Control and Prevention) Malaria branch, using the latest versions of the open-source technologies, and its production deployment is actively used by hundreds of users daily.

- *Open Science Grid - Generic Information Provider (OSG-GIP).* Led the technical development of this distributed information system software for cyberinfrastructure resource management through several projects funded by NSF. This software, a core piece of the OSG's information services infrastructure, has been widely deployed and used for distributed scientific computing in the U.S. enabling Grid interoperability, and OSG resource selection services.

Professional Service

- *Program Committee Member* Practice and Experience in Advanced Research Computing 2020 - PEARC20, Jul 26-30, 2020, Portland, OR, USA.
- *NSF Site Visit Panelist and Reviewer.* March 2020.

- *Program Committee Member.* 27th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems. Nov 5-8, 2019, Chicago, IL, USA.

- *Program Committee Member* Practice and Experience in Advanced Research Computing 2019 - PEARC19, Jul 29-Aug 1, 2019, Chicago, IL, USA.

- *NSF Site Visit Panelist and Reviewer.* March 2019.

- *Organizing Committee Member.* NSF Workshop on Conceptualizing a Geospatial Software Institute: Strategic Plan and Governance, July 14-16, 2019, Annapolis, MD, USA.

- *Co-Organizer.* AAG-UCGIS Summer School on Reproducible Problem Solving with CyberGIS and Geospatial Data Science, July 8-13, 2019, Urbana, Illinois, USA.

- *Program Committee Member.* Symposium on Frontiers in Geospatial Data Science, the American Association of Geographers Annual Meeting, April 3-7, 2019, Washington, DC, USA.

- *Organizing Committee Member.* NSF Workshop on Conceptualizing a Geospatial Software Institute: Geospatial Use Cases and Core Technical Capabilities, July 15-17, 2018, Chicago, IL, USA.

- *Program Committee Member.* Symposium on CyberGIS and Spatial Data Science, the American Association of Geographers Annual Meeting, April 10-11, 2018, New Orleans, LA, USA.

- *Organizing Committee Member.* NSF Workshop on Conceptualizing a Geospatial Software Institute: Connecting Big Data with Geospatial Discovery and Innovation, January 28-30, 2018, Los Angeles, CA, USA.

- *Co-Organizer.* UCGIS Summer School on Collaborative Problem Solving with CyberGIS and Geospatial Data Science, May 15-20, 2017, Urbana, IL, USA.

- *Local Organizing Chair.* The 3rd International Conference on CyberGIS and Geospatial Data Science (CyberGIS'16), Jul 26-28, 2016, Urbana, IL, USA.

- *Co-Chair.* NSF Workshop on Geospatial Data Science in the Era of Big Data and CyberGIS, Jul 25-26, 2016, Urbana, IL, USA.

- *NSF Site Visit Panelist and Reviewer.* Apr 2016.

- *Organizing Committee Member.* The 2015 NSF CyberGIS Project All Hands Meeting, Sept 14-16, 2015, Reston, VA, USA.

- *Organizing Committee Member.* Symposium on CyberGIS for Fostering New Frontiers of Geographic Research and Education. 111th Annual Meeting, Apr 21-25, 2015, Chicago, IL, USA.

- *Organizing Committee Member.* The 9th Gateway Computing Environments Workshop (GCE14). Mov 21, 2014, New Orleans, LA, USA.

- *Proposal Reviewer.* Natural Environment Research Council (NERC) tandard Research Grants UK, Sept 2014, UK.

- *Program Committee Member.* The 2nd International Conference on CyberGIS and Geodesign (CyberGIS'14), August 19-21, 2014, Redlands, CA, USA.

- *Program Committee Member.* Extreme Science and Engineering Discovery Environment 2014 Conference (XSEDE14). Jul 13-18, 2014, Atlanta, GA, USA.

- *Program Committee Member.* Science Gateway Institute Workshop, Sept 27, 2013, Indianapolis, IN, USA.

- *Program Committee Member.* CyberGIS Symposium, the Association of American Geographers 109$^{\text{th}}$ Annual Meeting, Apr 9-13, 2013, Los Angeles, CA, USA.

- *Program Committee Member.* The 1$^{\text{st}}$ International Conference on Space, Time, and CyberGIS (CyberGIS'12), Aug 6-9, 2012, Urbana, Il, USA.

- *Program Committee Member.* 2012 International Workshop on Modern Accelerator Technologies for GIScience, 2012, Columbus, OH, USA.

- *Program Committee Chair.* The 2$^{\text{nd}}$ ACM SIGSPATIAL International Workshop on High Performance and Distributed Geographic Information Systems (HPDGIS) 2011, Nov 1, 2011,Chicago, IL, USA.

- *Communication Chair.* ACM SIGSPATIAL International Workshop on High Performance and Distributed Geographic Information Systems (HPDGIS) 2010, Nov 2, 2010, San Jose, CA, USA.

- *Program Committee Member.* The 1$^{\text{st}}$ International Conference on Parallel, Distributed and Grid Computing (PDGC-2010). Oct 2010, Waknaghat, Solan (HP), India.

- *Technical Program Committee Member.* GridNets 2010, Oct 2010, Chicago, IL, USA.

- *Technical Program Committee Member.* GridNets 2009, Sept 2009, Athens, Greece.

- *Program Committee Member.* GridNets 2007, Oct 2007, Lyon, France.

- *Program Committee Member.* The 2007 International Workshop on Internet Computing for Science and Engineering, May 2007, Beijing, P. R. China.

- *Program Committee Member.* The 2006 International Workshop on Web-based Internet Computing for Science and Engineering, Jan 2006, Harbin, P. R. China.

- *Journal Reviewer.* GeoInformatica, Springer.

- *Journal Reviewer.* International Journal of Digital Earth, Taylor & Francis.

- *Journal Reviewer.* International Journal of Geographical Information Science, Taylor & Francis.

- *Journal Reviewer.* Journal of Grid Computing, Springer.

Selected Honors and Awards

- Best Research Poster Award, with Yanli Zhao (Lead Author), Shaowen Wang, and Yan Liu, at the 5$^{\text{th}}$ National Science Foundation (NSF) TeraGrid Annual Conference, 2011.

- Departmental (Computer Science) Nominee for University of Iowa's D.C. Spriestersbach Dissertation Prize, The University of Iowa, 2007.

- Student Scholar, Global Grid Forum (GGF-14), 2005.

- Graduate Travel Support, Information Technology Services, The University of Iowa, 2005, 2006.

- Travel Scholarship, Department of Computer Science, The University of Iowa, 2005.