

RANGA RAJU VATSAVAI, Ph.D.

Brief Biography

Raju is a Chancellor's Faculty Excellence Program Cluster Associate Professor in Geospatial Analytics in the Department of Computer Science, North Carolina State University (NCSU). For more than 25 years, he has been working at the intersection of spatial and temporal big data management, machine learning, and high-performance computing with applications in national security, geospatial intelligence, natural resources, climate change, location-based services, smart cities, real-time actionable knowledge extraction, and human terrain mapping. As the Associate Director of the Center for Geospatial Analytics (CGA), Raju is playing a leadership role in developing the center's strategic vision for spatial computing research and establishing new PhD program in geospatial analytics. As the first lead data scientist at the Oak Ridge National Laboratory, Raju played a leadership role in establishing data science research thrust for computational sciences and engineering division. He has published more than 100 peer-reviewed articles in leading conferences and journals, and co-edited two books on "Knowledge Discovery from Sensor Data." He served on organizing committees of SIAM Data Mining (SDM), IEEE ICDM, ACM SIGSPATIAL GIS, and served on the program committees of leading international conferences including ACM KDD, ICDM, ECML/PKDD, SDM, PAKDD, ACM GIS, CIKM, WACV, and IEEE Big Data Congress. He holds M.S. and Ph.D. degrees in computer science from the University of Minnesota.

Education

Ph.D., Computer Science, 2008, University of Minnesota, MN, USA, Major Advisor: Prof. Shashi Shekhar. *Thesis*: Machine Learning Algorithms for Spatiotemporal Data Analysis.

M.S., in Computer Science, 2003, University of Minnesota, USA. Advisor: Prof. Shashi Shekhar. *Thesis*: Online GeoSpatial Processing (OLGP): An Experimentation With the UMN-MapServer.

Professional Experience (Full time: 30+ Years)

- 2014- NORTH CAROLINA STATE UNIVERSITY
 - Associate Professor, Department of Computer Science
 - Associate Director, The Center for Geospatial Analytics
- 2014- OAK RIDGE NATIONAL LABORATORY, COMPUTATIONAL SCIENCES AND ENGINEERING DIVISION
 - Joint Faculty Appointment (JFA)
- 2006-2014 OAK RIDGE NATIONAL LABORATORY, COMPUTATIONAL SCIENCES AND ENGINEERING DIVISION
 - Lead Data Scientist (2013-2014); Senior Research Scientist (2010-2013); Research Scientist (2006-2010)
- 2004-2006 IBM-RESEARCH, IRL, INDIAN INSTITUTE OF TECHNOLOGY (IIT-DELHI) CAMPUS, INDIA
 - Post Doctoral Researcher (2004); Research Staff Member (2005-2006)
- 1999-2004 REMOTE SENSING LABORATORY. UNIVERSITY OF MINNESOTA, MN, USA
 - Research Fellow
- 1995-1998 CENTER FOR DEVELOPMENT OF ADVANCED COMPUTING (C-DAC), GOVT. OF INDIA, INDIA.
 - Member Technical Staff
- 1990-1995 NATIONAL FOREST DATA MANAGEMENT CENTER (NFDMC), FOREST SURVEY OF INDIA, GOVT. OF INDIA, INDIA.
 - Technical Assistant

Membership in Professional Organizations:

ACM (2008-present); IEEE (2010-present)

Scholarly and Professional Honors (Most Recent)

- Lenovo and Intel University AI Innovation Challenge Award, SC-19: The International Conference for High Performance Computing, Networking, Storage, and Analysis
- Lenovo and Intel University AI Innovation Challenge Award, SC-18: The International Conference for High Performance Computing, Networking, Storage, and Analysis
- Elsevier Best Paper, Poster Paper Award, International Conference on Computational Sciences, 2016.
- Distinguished Performance Evaluation, ORNL/UT-Battelle, 2008-2014.
- Outstanding Mentor Award, ORNL/UT-Battelle, 2013.
- Director's Best R&D Poster Award for LDRD project on scalable biomass monitoring. 2011. (Selected among 40+ LDRD projects at ORNL : 2008-2010)
- Exceptional mentoring award, DOE sponsored "Research Alliance in Math and Science," 2010 & 2011.
- Best of CIDU-2010, Selected as one of the six best papers at the NASA/CIDU and published in the special issue of Statistical Analysis and Data Mining Journal.
- Exceptional mentoring award, DOE sponsored "Research Alliance in Math and Science," 2010 & 2011.

Professional Service (On Campus)

- University Faculty Scholars Review Committee, College of Engineering, 2019-present
- Awards Committee, Computer Science Department, 2019-present
- Computing and Technology Committee (Chair), Center for Geospatial Analytics, 2015-present
- Ph.D. in Geospatial Analytics Committee, Center for Geospatial Analytics, 2015-present
- Steering Committee, Center for Geospatial Analytics, 2015-present
- Two Faculty Search Committees: BAE (2017) and MEAS/CGA (2017-18).

Professional Service (Off Campus)

- Co-chair, SIAM Data Mining Panel (2020)
- Co-chair: ICDM Panel (2020), ICDM PhD Forum (2018), ICDM tutorials (2017)
- Co-chair, IEEE Big Data Congress Short Papers Track (2016)
- Co-chair, ACM SIGSPATIAL Cup (2015-16), ACM SIGSPATIAL Workshops (2020)
- Co-chair, ACM SIGSPATIAL Workshop on Analytics for Big Geospatial Data (BigSpatial:2012-)
- Co-chair, IEEE ICDM Workshop on Spatial and Spatiotemporal Data Mining (SSTD: 2008-)
- Co-chair, ACM KDD Workshop on Data Science for Food, Water and Energy (DS-FEW) (2016-17)
- Co-chair, ACM/IEEE SC International Workshop on Big Data Analytics (BDAC: 2010-2016)
- Co-chair, IEEE ICDM Workshop on Knowledge Discovery Using Cloud and Distributed Computing (2010-13)
- Co-chair, ACM SIGKDD Workshop on Knowledge Discovery from Sensor Data (Sensor-KDD:2008-12)
- Co-chair, ACM SIGKDD Workshop on Large-scale Data Mining: Theory & App. (LDMTA: 2011)
- Co-chair, ACM SIGSPATIAL International Workshop on High Performance and Distributed Geographic Information Systems (HPDGIS: 2010-2011)
- **PC Member** (Major International Conferences): ICDM (2020), AAAI (2018-20), ECML/PKDD (2017-20), ACM KDD (2005-18), ACM GIS (2008-18), IEEE Big Data Congress (2015-16, 2020), CIKM (2020), SDM (2020), ICTAI (2007-08), IEEE MultiTemp (2015), PAKDD (2016-17,19).
- **Action Editor**, Springer GeoInformatica (2012-)
- **Keynote/Invited Talks:** 40+
- **NSF, DOE, NASA Panels:** 20+

Contribution Type:

[C] Corresponding Author; [L] Lead Author; [E] Equal Contribution; [M] Minor Contribution.

Journal Editorials

- [1] [E] Naoki Abe, **Ranga Raju Vatsavai** (Topic Editors): Big Data for Food, Energy and Water. *Frontiers Big Data*. 2019.
- [2] [L] **Ranga Raju Vatsavai**, Varun Chandola (Editors): Guest editorial: big spatial data. *GeoInformatica*. 20(4), 2016.
- [3] [E] Ganguly, Gama, Omिताomu, Gaber, and **Vatsavai** (Editors) Special Issue on “Knowledge Discovery from Sensor Data Streams.” *Intelligent Data Analysis Journal*, Vol. 13., No. 3., 2009.

Patents

- [4] **Ranga Raju Vatsavai**, Jordan Graesser, Budhendra Bhaduri: Bag of Gaussians (BoG) Model for Mapping Settlements. US9384397 B2. 2016.
- [5] Aleksandar D. Dimitrovski, Steven J. Fernandez, Christopher S. Groer, Yilu Liu, James J. Nutaro, Olufemi A. Omिताomu, Mallikarjun Shanker, Kyle L. Spafford, **Ranga Raju Vatsavai**: Real-time simulation of power grid disruption. US20130191052 A1. 2013.
- [6] Laurent Sebastien Mignet, Sourashis Roy, Torsten Steinbach, **Ranga Raju Vatsavai**: Method and system for scheduling workload in databases. International Business Machines (IBM), US7599969 B2. Oct. 6, 2009.

Edited Books

- [7] [E] Gama, **Vatsavai**, Omिताomu, Chawla, Gaber, and Ganguly (Editors). “Knowledge Discovery from Sensor Data.” *Lecture Notes in Computer Science*, Springer Verlag. 2009.
- [8] [E] Ganguly, Gama, Omिताomu, Gaber, and **Vatsavai** (Editors). “Knowledge Discovery from Sensor Data.” ISBN: 9781420082326, CRC Press. December 2008.

Refereed Journal Publications

- [9] [E] Bharathkumar Ramachandra, Benjamin Dutton, **Ranga Raju Vatsavai**: Anomalous cluster detection in spatiotemporal meteorological fields. *The ASA Data Sci Journal*. 2019; 12: 88– 100 (2019)
- [10] [E] Van Berkel, D.; Shashidharan, A.; Mordecai, R.S.; **Vatsavai, R.**; Petrasova, A.; Petras, V.; Mitasova, H.; Vogler, J.B.; Meentemeyer, R.K. Projecting Urbanization and Landscape Change at Large Scale Using the FUTURES Model. *Land* 2019, 8, 144.
- [11] [M] Ryan S. F., Adamson N. L., Aktipis A., Andersen L. K., Austin R., Barnes L., Beasley M. R., Bedell K. D., Briggs S., Chapman B., Cooper C. B., Corn J. O., Creamer N. G., Delborne J. A., Domenico P., Driscoll E., Goodwin J., Hjarding A., Hulbert J. M., Isard S., Just M. G., Kar Gupta K., López-Uribe M. M., O’Sullivan J., Landis E. A., Madden A. A., McKenney E. A., Nichols L. M., Reading B. J., Russell S., Sengupta N., Shapiro L. R., Shell L. K., Sheard J. K., Shoemaker D. D., Sorger D. M., Starling C., Thakur S., **Vatsavai R. R.**, Weinstein M., Winfrey P. and Dunn R. R.: The role of citizen science in addressing grand challenges in food and agriculture research. *Proc. R. Soc. B*. <http://doi.org/10.1098/rspb.2018.1>. (2019)
- [12] [E] Bharathkumar Ramachandra, Jacob Monroe, Pranav Nawathe, Kevin Han, Youngjib Ham, **Ranga Raju Vatsavai**: Real-Time Energy Audit of Built Environments: Simultaneous Localization and Thermal Mapping. *Journal of Infrastructure Systems (ASCE)*, 24(3), 2018.

- [13] [E] Ujwala Bhangale, Surya S. Durbha, Roger L. King, Nicolas H. Younan, **Ranga Raju Vatsavai**, High performance GPU computing based approaches for oil spill detection from multi-temporal remote sensing data, *Remote Sensing of Environment*, Vol. 202, 2017, ISSN 0034-4257
- [14] [E] Yupeng Yan, Manu Sethi, Anand Rangarajan, **Ranga Raju Vatsavai**, Sanjay Ranka: Graph-Based Semi-Supervised Classification on High Resolution Remote Sensing Images. *International Journal of Big Data Intelligence*, 4 (2), 108-122, 2017.
- [15] [E] K. R. Kurte, S. S. Durbha, R. L. King, N. H. Younan and **R. Vatsavai**: Semantics-Enabled Framework for Spatial Image Information Mining of Linked Earth Observation Data. *In IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, Vol. 10, no. 1, pp. 29-44, Jan. 2017.
- [16] [E] Anuj Karapante, Zhe Jiang, **Ranga Raju Vatsavai**, Shashi Shekhar, and Vipin Kumar: Monitoring Land Cover Changes using Remote Sensing Data: A Machine Learning Perspective. *IEEE Geoscience and Remote Sensing Magazine*, Volume: 4, Issue: 2. 2016.
- [17] [E] Juan Carlos Idrobo, Rusz Jakob Spiegelberg, Michael A. McGuire, Christopher T. Symons, **Ranga Raju Vatsavai**, Claudia Cantoni, Andrew R. Lupini: Detecting Magnetic Ordering with Atomic Size Electron Probes. *Advanced Structural and Chemical Imaging*, 2(1):5. 2016.
- [18] [E] Budhendra Bhaduri, Dilip Patlolla, **Ranga R. Vatsavai**, Anil Cheriyyadat, Wei Lu, and Rajasekar Karthik: Emerging trends in monitoring landscapes and energy infrastructures with big spatial data. *SIGSPATIAL Special 6*, 3 (April 2015), 35-45.
- [19] [E] J. Graesser, A. Cheriyyadat, **R. R. Vatsavai**, V. Chandola, J. Long and E. Bright, Image Based Characterization of Formal and Informal Neighborhoods in an Urban Landscape, *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 5(4):1164-1176, (2012)
- [20] [CL] **Ranga Raju Vatsavai**, Budhendra L. Bhaduri. A hybrid classification scheme for mining multi-source geospatial data. *GeoInformatica: An International Journal on Advances of Computer Science for Geographic Information Systems* 15(1): 29-47 (2011).
- [21] [E] Varun Chandola, **Ranga Raju Vatsavai**. A scalable gaussian process analysis algorithm for biomass monitoring. *Statistical Analysis and Data Mining* 4(4): 430-445 (2011).
- [22] [CL] **Ranga R. Vatsavai**, Shashi Shekhar, and Thomas E. Burk. An Efficient Spatial Semi-supervised Learning Algorithm. *In International Journal of Parallel, Emergent and Distributed Systems*, 22(6), 2007.
- [23] [E] Shashi Shekhar, Paul R. Schrater, **Ranga R. Vatsavai**, Weili Wu, and Sanjay Chawla. Spatial contextual classification and prediction models for mining geospatial data. *IEEE Transactions on Multimedia*, 4(2), June 2002.

Journal Papers (Under Review)

- [24] [M] Ramachandra, Bharathkumar; Jones, Michael; **Vatsavai, Ranga Raju**. A Survey of Single-Scene Video Anomaly Detection. *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, 2020.
- [25] [M] Ramachandra, Bharathkumar; Jones, Michael; **Vatsavai, Ranga Raju**. Perceptual Metric Learning for Video Anomaly Detection. *Springer Machine Vision and Applications (MVA)*, 2020.
- [26] [M] Zexi Chen; Bharathkumar Ramachandra; Tianfu Wu; **Ranga Raju Vatsavai**. Relational Long Short-Term Memory for Video Action Recognition. *Pattern Recognition (PR)*, 2019.
- [27] [M] Bharathkumar Ramachandra; **Ranga Raju Vatsavai**. Estimating a Manifold from a Tangent Bundle Learner. *Springer Data Mining and Knowledge Discovery (DAMI)*, 2018.

Refereed Conference Publications

- [28] [E] KRISHNA KARTHIK GADIRAJU, BHARATHKUMAR RAMACHANDRA, ZEXI CHEN, **Ranga Raju Vatsavai**: “Multi Modal Deep Learning Based Crop Classification Using Multispectral and Multitemporal Satellite Imagery.” 26th ACM SIGKDD international conference on knowledge discovery and data mining (KDD). 2020. (Accepted)
- [29] [E] ZEXI CHEN, BENJAMIN DUTTON, BHARATHKUMAR RAMACHANDRA, TIANFU WU, **Ranga Raju Vatsavai**: “Local Clustering with Mean Teacher for Semi-supervised learning.” 25th International Conference on Pattern Recognition (ICPR). 2020. (Accepted)
- [30] [E] BHARATHKUMAR RAMACHANDRA, MICHAEL JONES, **Ranga Raju Vatsavai**: “Learning a distance function with a Siamese network to localize anomalies in videos.” IEEE Winter Conference on Applications of Computer Vision (WACV 2020), March 2-5, Aspen, CO. 2020.
- [31] [E] KRISHNA KARTHIK GADIRAJU, BHARATHKUMAR RAMACHANDRA, ASHWIN SHASHIDHARAN, BENJAMIN DUTTON, **Ranga Raju Vatsavai**: “Scalable Data Parallel Approaches to Anomaly Detection in Climate Data using Gaussian Processes.” The 18th IEEE International Conference On Machine Learning And Applications (ICMLA 2019).
- [32] [E] KRISHNA KARTHIK GADIRAJU, BHARATHKUMAR RAMACHANDRA, **Ranga Raju Vatsavai**: “Classification Performance Evaluation of Deep Learning Architectures for Complex Object Based Facility Recognition.” IEEE International Geoscience and Remote Sensing Symposium (IGARSS) 2019: 3057-3060
- [33] [E] BHARATHKUMAR RAMACHANDRA, KRISHNA KARTHIK GADIRAJU, **Ranga Raju Vatsavai**, JAIME PUENTE: “Scaling Deep Learning Based Crop Classification on Modern Intel Xeon Processors.” IEEE International Geoscience and Remote Sensing Symposium (IGARSS) 2019: 3732-3735
- [34] [E] ASHWIN SHASHIDHARAN, **Ranga Raju Vatsavai**, ROSS K MEENTEMEYER: “FUTURES-DPE: towards dynamic provisioning and execution of geosimulations in HPC environments.” Proceedings of the 26th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL GIS). November 2018.
- [35] [E] ASHWIN SHASHIDHARAN, **Ranga Raju Vatsavai**, DB VAN BERKEL, ROSS K MEENTEMEYER: “FUTURES-AMR: Towards an Adaptive Mesh Refinement Framework for Geosimulations.” Proceedings of the 10th International Conference on Geographic Information Science (GIScience 2018). Leibniz International Proceedings in Informatics (LIPIcs). Vol. 114. 2018. (**Nominated for best paper**)
- [36] [E] ASHWIN SHASHIDHARAN, **Ranga Raju Vatsavai**, ABHINAV ASHISH, ROSS K MEENTEMEYER: “tFUTURES: Computational Steering for Geosimulations.” Proceedings of the 25th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL GIS), Redondo Beach, CA, USA. November 2017.
- [37] [E] SUSHIL K. PRASAD, DANIAL AGHAJARIAN, MICHAEL McDERMOTT, DHARA SHAH, MOHAMED MOKBEL, SATISH PURI, SERGIO J. REY, SHASHI SHEKHAR, YIQUN XE, **Ranga Raju Vatsavai**, FUSHENG WANG, YANHUI LIANG, HOANG VO, SHAOWEN WANG: “Parallel Processing over Spatial-Temporal Datasets from Geo, Bio, Climate and Social Science Communities: A Research Roadmap,” IEEE International Congress on Big Data (BigData Congress), Honolulu, HI, USA, 2017, pp. 232-250.
- [38] [EC] CLAYTON CONNORS, **Ranga Raju Vatsavai**: “Semi-Supervised Deep Generative Models for Change Detection In Very High Resolution Imagery.” *IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*. 2017. (**Connors, UG, Received IEEE GRSS Travel Grant**)
- [39] [EC] ZEXI CHEN, BHARATHKUMAR RAMACHANDRA, **Ranga Raju Vatsavai**: “Hierarchical Change Detection Framework for Biomass Monitoring.” *IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*. 2017. (**Chen, Received IEEE GRSS Travel Grant**)

- [40] [E] BHARATHKUMAR RAMACHANDRA, JACOB MONROE, PRANAV NAWATHE, KEVIN HAN, YOUNGJIB HAM, **Ranga Raju Vatsavai**: Energy Audit of Built Environments Through Real-Time Localization And Thermal Mapping. *International Conference on Maintenance and Rehabilitation of Constructed Infrastructure Facilities (MAIREINFRA)*. 2017. (Also got invited to the **ASCE Journal of Infrastructure Systems**)
- [41] [E] BHARATHKUMAR RAMACHANDRA, KRISHNA KARTHIK GADIRAJU, RANGA RAJU VATSAVAI, DALE P. KAISER, AND THOMAS P. KARNOWSKI: Detecting Extreme Events in Gridded Climate Data. *International Conference on Computational Sciences (ICCS)* 2016. (Received Elsevier Best Paper/Poster Paper Award)
- [42] [E] SEOKYONG HONG AND RANGA RAJU VATSAVAI: A Scalable Probabilistic Change Detection Algorithm for Very High Resolution (VHR) Satellite Imagery *IEEE BigData Congress*: 2016
- [43] [C] SEOKYONG HONG AND RANGA RAJU VATSAVAI: Sliding Window-based Probabilistic Change Detection for Remote-sensed Images. *International Conference on Computational Sciences (ICCS)*: 2016
- [44] [E] SEOKYONG HONG, SANGKEUN LEE, SEUNG-HWAN LIM, SREENIVAS R. SUKUMAR, RANGA RAJU VATSAVAI: Evaluation of Graph Pattern Matching in Graph Analysis Systems. *ACM International Symposium on High-Performance Parallel and Distributed Computing (HPDC)*. 2016
- [45] [E] A SHASHIDHARAN, DB VAN BERKEL, RR VATSAVAI, RK MEENTEMEYER. pFUTURES: A Parallel Framework for Cellular Automaton Based Urban Growth Models. *International Conference on Geographic Information Science (GIScience)*, 163-177. 2016.
- [46] [LC] RANGA RAJU VATSAVAI: A Scalable Complex Pattern Mining Framework for Global Settlement Mapping. *IEEE BigData Congress*: 2015
- [47] [LC] **Ranga Raju Vatsavai**: Computationally Efficient Algorithms for Settlement Mapping Using Very High-resolution Images. *GeoComputation*: 2015
- [48] [E] MANU SETHI, YUPENG YAN, ANAND RANGARAJAN, RANGA RAJU VATSAVAI, SANJAY RANKA: Scalable Machine Learning Approaches for Neighborhood Classification Using Very High Resolution Remote Sensing Imagery. *ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD)*: 2015
- [49] [L] RANGA RAJU VATSAVAI: Multitemporal data mining: From biomass monitoring to nuclear proliferation detection. *8th International Workshop on the Analysis of Multitemporal Remote Sensing Images*: IEEE, 2015
- [50] [C] SEOKYONG HONG, SEUNG-HWAN LIM, SANGKEUN LEE, SRINIVAS R. SUKUMAR, AND RANGA RAJU VATSAVAI: Benchmarking High Performance Graph Analysis Systems with Graph Mining and Pattern Matching Workloads. *International Conference for High Performance Computing, Networking, Storage and Analysis (SC-15) (Poster Paper)*, 2015
- [51] [E] Manu Sethi, Yupeng Yan, Anand Rangarajan, **Ranga Raju Vatsavai**, Sanjay Ranka: An efficient computational framework for labeling large scale spatiotemporal remote sensing datasets. *International Conference on Contemporary Computing (IC3)*: 2014: 635-640
- [52] [LC] **Ranga Raju Vatsavai**. Gaussian multiple instance learning approach for mapping the slums of the world using very high resolution imagery. In Proceedings of the 19th ACM SIGKDD international conference on Knowledge discovery and data mining (KDD '13). ACM, New York, NY, USA, 1419-1426. (2013)
- [53] [E] BW Martin, **Ranga Raju Vatsavai**. Evaluating fusion techniques for multisensor satellite image data. SPIE Defense, Security, and Sensing, 87470J-87470J-8 (2013)
- [54] [E] BW Martin, **Ranga Raju Vatsavai**. Image change detection via ensemble learning. SPIE Defense, Security, and Sensing, 87470J-87470J-8 (2013)

- [55] [LC] Vatsavai, R.R.; Bhaduri, B.; Graesser, J., “Complex settlement pattern extraction with multi-instance learning,” Joint Urban Remote Sensing Event (JURSE), April 2013.
- [56] [M] BW Martin, **Ranga Raju Vatsavai**. Exploring improvements for simple image classification. In Proceedings of IEEE Southeastcon, (2013)
- [57] [LC] **Ranga Raju Vatsavai**, Jordan Graesser: Probabilistic Change Detection Framework for Analyzing Settlement Dynamics Using Very High-resolution Satellite Imagery. *Procedia CS 9*: 907-916 (2012)
- [58] [LC] **Ranga Raju Vatsavai**: Rapid Damage eXplorer (RDX): A Probabilistic Framework for Learning Changes from Bitemporal Images. IEEE International Conference on Data Mining (ICDM-12) (Demo paper): 906-909
- [59] [LC] **Ranga Raju Vatsavai**: A Data Mining Framework for Monitoring Nuclear Facilities. IEEE International Conference on Data Mining (ICDM) (Industry Track) (2012): 917
- [60] [E] Christopher T. Symons, **Ranga Raju Vatsavai**, Goo Jun, Itamar Arel: Bias Selection Using Task-Targeted Random Subspaces for Robust Application of Graph-Based Semi-supervised Learning. 11th International Conference on Machine Learning and Applications, ICMLA (1) 2012: 415-420
- [61] [LC] **Ranga Raju Vatsavai**: A machine learning system for recognizing subclasses. International Conference on Computing for Geospatial Research and Applications (Demo paper) COM.Geo 2012: 32
- [62] [LC] **Ranga Raju Vatsavai**: Modeling spatial dependencies and semantic concepts in data mining. International Conference on Computing for Geospatial Research and Applications (Tutorial paper) COM.Geo 2012: 46
- [63] [LC] **Ranga Raju Vatsavai**, Christopher T. Symons, Varun Chandola, Goo Jun. GX-Means: A model-based divide and merge algorithm for geospatial image clustering. *Procedia CS 4*: 186-195 (2011)
- [64] [E] Forrest M. Hoffman, J. Walter Larson, Richard Tran Mills, B-Gustaf J. Brooks, Auroop R. Ganguly, William W. Hargrove, Jian Huang, Jitendra Kumar, **Ranga Raju Vatsavai**. Data Mining in Earth System Science. *Procedia CS 4*: 1450-1455 (2011)
- [65] [LC] **Ranga Raju Vatsavai**, Eddie A. Bright, Varun Chandola, Budhendra L. Bhaduri, Anil Cheriyyadat, Jordan Graesser: Machine learning approaches for high-resolution urban land cover classification: a comparative study. *2nd International Conference and Exhibition on Computing for Geospatial Research & Application (COM.Geo)* 2011: 11
- [66] [E] Varun Chandola, **Ranga Raju Vatsavai**, Budhendra L. Bhaduri: iGlobe: an interactive visualization and analysis framework for geospatial data. *2nd International Conference and Exhibition on Computing for Geospatial Research & Application (COM.Geo)* 2011: 21
- [67] [E] Varun Chandola, **Ranga Raju Vatsavai**. A Gaussian Process Based Online Change Detection Algorithm for Monitoring Periodic Time Series. *SIAM Data Mining (SDM)* 2011: 95-106.
- [68] [LC] **Ranga Raju Vatsavai**, M. Tuttle, Budhendra L. Bhaduri, Edward Bright, Anil Cheriyyadat, Varun Chandola, J. Graesser: Rapid damage assessment using high-resolution remote sensing imagery: Tools and techniques. *IEEE International Geoscience and Remote Sensing Symposium (IGARSS)* 2011: 1445-1448
- [69] [E] Randy S. Roberts, Paul A. Pope, **Ranga Raju Vatsavai**, Ming Jiang, Lloyd F. Arrowood, Timothy G. Trucano, Shaun S. Gleason, Anil Cheriyyadat, Alex Sorokine, Aggelos K. Katsaggelos, Thrasyvoulos N. Pappas, Lucinda R. Gaines, Lawrence K. Chilton: Design of benchmark imagery for validating facility annotation algorithms. *IEEE International Geoscience and Remote Sensing Symposium (IGARSS)* 2011: 1453-1456
- [70] [E] Shaun S. Gleason, Mesfin Dema, Hamed Sari-Sarraf, Anil Cheriyyadat, **Ranga Raju Vatsavai**, Regina Ferrell: Verification & validation of a semantic image tagging framework via generation of geospatial imagery ground truth. *IEEE International Geoscience and Remote Sensing Symposium (IGARSS)* 2011: 1577-1580.

- [71] [E] Varun Chandola, **Ranga Raju Vatsavai**. “Multi-temporal Remote Sensing Image Classification - A Multi-view Approach.” In *Proceedings of the NASA Conference on Intelligent Data Understanding (CIDU)* NASA Center for Aerospace Information, 2010.
- [72] [LC] **Ranga Raju Vatsavai**, et. al. “Geospatial Image Mining for Nuclear Proliferation Detection: Challenges and New Opportunities.” In *Proceedings of the IEEE Geoscience and Remote Sensing Symposium (IGARSS)* IEEE Press, 2010.
- [73] [E] Shaun Gleason, Regina Ferrell, Anil Cheriyyadat, **Ranga Raju Vatsavai**, Soumya De. “Semantic Information Extraction from Multispectral Geospatial Imagery via A Flexible Framework.” In *Proceedings of the IEEE Geoscience and Remote Sensing Symposium (IGARSS)* IEEE Press, 2010.
- [74] [E] Varun Chandola, **Ranga Raju Vatsavai**. “Scalable Time Series Change Detection for Biomass Monitoring Using Gaussian Process.” In *Proceedings of the NASA Conference on Intelligent Data Understanding (CIDU)* NASA Center for Aerospace Information, 2010. **(One of the top six papers selected to be published in the Journal of Statistical Analysis and Data Mining).**
- [75] [LC] **Ranga Raju Vatsavai**, Anil Cheriyyadat, and Shaun Gleason. “Supervised Semantic Classification for Nuclear Nonproliferation Monitoring.” In *Proceedings of the Applied Imagery Pattern Recognition (AIPR)* IEEE CS Press, 2010.
- [76] [E] Dadi, Upendra; Cheng Liu; **Vatsavai, Ranga Raju**. “Query and Visualization of extremely large network datasets over the web using Quadtree based KML Regional Network Links.” In *Proceedings of the 17th International Conference on Geoinformatics*, IEEE CS Press, pp.1-4, 12-14 Aug. 2009.
- [77] [LC] **Ranga Raju Vatsavai**. “Incremental Clustering Algorithm for Earth Science Data Mining.” In *Proceedings of the 9th International Conference on Computational Science, ICCS (2) 2009*: 375-384.
- [78] [LC] **Ranga Raju Vatsavai**. “BioMon: a Google Earth based continuous biomass monitoring system.” In *Proceedings of the 17th ACM SIGSPATIAL International Symposium on Advances in Geographic Information Systems*, (ACM GIS) 2009: 536-537, ACM, ISBN 978-1-60558-649-6
- [79] [LC] **Ranga Raju Vatsavai**, Shashi Shekhar, Budhendra L. Bhaduri: A Learning Scheme for Recognizing Sub-classes from Model Trained on Aggregate Classes. In *Proceedings of 7th International Workshop on Statistical Techniques in Pattern Recognition (SSPR/SPR)*, LNCS Vol. 5342:967-976, Springer, 2008.
- [80] [LC] **Ranga Raju Vatsavai**, Shashi Shekhar, Thomas E. Burk, Budhendra L. Bhaduri: *Miner: A Suit of Classifiers for Spatial, Temporal, Ancillary, and Remote Sensing Data Mining. In *Proceedings of International Conference on Information Technology : New Generations (ITNG)*, IEEE Computer Society Press, 2008: 801-806.
- [81] [LC] **Ranga Raju Vatsavai**, Shashi Shekhar, Budhendra L. Bhaduri: Sub-class Recognition from Aggregate Class Labels: Preliminary Results. In *Proceedings of IEEE International Conference on Tools with Artificial Intelligence (ICTAI)*, 2008: 61-64.
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Refereed Workshop (ACM/IEEE) Full Papers

- [99] [E] **Ranga Raju Vatsavai**, BHARATHKUMAR RAMACHANDRA, ZEXI CHEN, JOHN JERNIGAN: “geoEdge: A real-time analytics framework for geospatial applications.” Proceedings of the 8th ACM SIGSPATIAL International Workshop on Analytics for Big Geospatial Data. ACM DL. 2019/11/5.
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- [110] **Ranga Raju Vatsavai**: *STPMiner: a highperformance spatiotemporal pattern mining toolbox*. In Proceedings of the 2nd SC International workshop on Petascale Data Analytics: Challenges and Opportunities (PDAC ’11). ACM, New York, NY, USA, 29-34.
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Book Chapters

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- [132] [E] Shashi Shekhar, C. T. Lu, X. Tan, S. Chawla, and **R. R. Vatsavai**. Map Cube: A visualization tool for spatial data warehouses. In Harvey J. Miller and Jiawei Han, editors, *Geographic Data Mining and Knowledge Discovery*. Taylor and Francis, 2001.

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- [133] [E] Varun Chandola and Ranga Raju Vatsavai. 2019. The seventh ACM SIGSPATIAL International workshop on analysis for big spatial data. Seattle, WA, USA. SIGSPATIAL Special 10 (3), 12-13. 2018.
- [134] [E] Varun Chandola and Ranga Raju Vatsavai. 2018. The sixth ACM SIGSPATIAL International workshop on analysis for big spatial data. Redondo Beach, CA, USA. SIGSPATIAL Special 9 (3), 20-21, 2017.
- [135] [E] Naoki Abe, Yiqun Xie, Shashi Shekhar, Chid Apte, Vipin Kumar, Mitch Tuinstra, and Ranga Raju Vatsavai. 2017. Data Science for Food, Energy and Water: A Workshop Report. SIGKDD Explor. Newsl. 18, 2 (March 2017), 1-4.
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- [138] [E] Varun Chandola and Ranga Raju Vatsavai. 2014. BigSpatial-2013 workshop report: 2nd ACM SIGSPATIAL International Workshop on Analytics for Big Geospatial Data (BigSpatial-2013): Nov 5, 2013, Orlando, Florida, USA. ACM SIGSPATIAL Special 6(1), 2013.
- [139] [E] Varun Chandola, Ranga Raju Vatsavai, and Chetan Gupta. 2013. BigSpatial-2012: 1st ACM SIGSPATIAL International Workshop on Analytics for Big Geospatial Data (BigSpatial-2012): Nov 6, 2012, Redondo Beach, CA, USA.
- [140] [E] RR Vatsavai. 2013. ICDM 4th International workshop on knowledge discovery using cloud and distributed computing platforms. (KDCloud-30), Sydney, Australia. Dec. 14, 2010.
- [141] [M] S Wang, A Padmanabhan, N Wilkins-Diehr, X Shi, RR Vatsavai: Highlights on ACM HPDGIS 2011: the Second International ACM SIGSPATIAL Workshop on High Performance and Distributed Geographic Information Systems (HPDGIS) 2011: (Chicago, Illinois-November 1, 2011). SIGSPATIAL Special 4(1): 6-7 (2012)

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- [143] [E] RR Vatsavai. 2010. ICDM 1st International workshop on knowledge discovery using cloud and distributed computing platforms. (KDCloud-10), Sydney, Australia. Dec. 14, 2010.
- [144] [E] Olufemi A. Omitaomu, **Ranga Raju Vatsavai**, Auroop R. Ganguly, Nitesh V. Chawla, Joao Gama, Mohamed Medhat Gaber: Knowledge discovery from sensor data (SensorKDD). *SIGKDD Explorations* 11(2): 84-87 (2009)
- [145] [E] **Ranga Raju Vatsavai**, Olufemi A. Omitaomu, Joao Gama, Nitesh V. Chawla, Mohamed Medhat Gaber, Auroop R. Ganguly: Knowledge discovery from sensor data (SensorKDD). *SIGKDD Explorations* 10(2): 68-73 (2008)

Edited Workshop (in cooperation with leading conferences) Proceedings (Total: 30+ Editions)

- [146] [E] Varun Chandola and **Ranga Raju Vatsavai** (Eds.). Proceedings of the ACM SIGSPATIAL International Workshop on Analytics for Big Geospatial Data. ACM, New York, NY, USA. (2013-2019; **8 Editions**)
- [147] [C] Shashi Shekhar, Peggy Agouris, **Ranga Raju Vatsavai**, et. al. Proceedings of IEEE/ICDM Workshop on Spatial and Spatiotemporal Data Mining (SSTDM). IEEE. (2007-2019; **13 Editions**)
- [148] [C] **Ranga Raju Vatsavai**, Scott Klasky, and Manish Parashar. (Eds.). Proceedings of IEEE/ACM SC International Workshop on Big Data Analytics: Challenges, and Opportunities (BDAC). (2010-2016); **7 Editions**)
- [149] [C] **Ranga Raju Vatsavai**, et. al. Proceedings of IEEE/ICDM Workshop on Knowledge Discovery Using Cloud and Distributed Computing Platforms (KDCloud). IEEE. (2010-2013; **4 Editions**)
- [150] [E] Chidanand Apte, Nitesh Chawla, Amol Ghoting, Yan Liu, Jimeng Sun, Jie Tang, **Ranga Raju Vatsavai**. Proceedings of the 3rd Workshop on Large-scale Data Mining: Theory and Applications (LDMTA). ACM Digital Library, 2011.
- [151] [E] Olufemi A. Omitaomu, Auroop R. Ganguly, Joao Gama, **Ranga Raju Vatsavai**, Nitesh V. Chawla, Mohamed Medhat Gaber. Proceedings of the Third International Workshop on Knowledge Discovery from Sensor Data, Paris, France, June 28, 2009 ACM 2009. ISBN 978-1-60558-668-7.

Invited Talks/Papers

- [1] **Ranga Raju Vatsavai**. “GeoAI: Deep Learning for Advanced Remote Sensing.” International Conference on Pattern Recognition and Intelligent Systems (PRIS 2020). July 30, 2020.
- [2] **Ranga Raju Vatsavai**. “AI-RDX: AI for Rapid Damage eXplorations.” Workshop on Disaster Research NC State. Insights from Hurricane Florence and other Events. April 18. Hunt Library, NCSU. 2019.
- [3] **Ranga Raju Vatsavai**. “Geospatial AI Research at NCSU.” Marshall-NCSU Building research collaborations event. April 22. 2019.
- [4] **Ranga Raju Vatsavai**. “Deep Computer Vision for High Resolution Settlement Mapping.” USAID Digital Tools and the Future of International Development. 5/17/19. DC, USA.
- [5] **Ranga Raju Vatsavai**. “GeoSpatial Analytics at NCSU.” ECU-NCSU Research Partnership Day. July 22. 2019.
- [6] **Ranga Raju Vatsavai**. “GeoAI: Geospatial AI for Social Good.” ORNL Workshop on Solving the Big AI Problems, ORNL, Sept. 19-20, 2019.

- [7] **Ranga Raju Vatsavai.** “Spatiotemporal Computing at the Edge.” The Trillion Pixel GeoAI Challenge Workshop, ORNL, Sept. 26-27, 2019.
- [8] **Ranga Raju Vatsavai.** “GeoAI: Geospatial AI for Monitoring Crops to Nuclear Proliferation Using Global Earth Observations.” 3rd ACM SIGSPATIAL International Workshop on AI for Geographic Knowledge Discovery (GeoAI 2019). November 5, 2019. Chicago. IL.
- [9] **Ranga Raju Vatsavai.** “AI for Agriculture: Future of Food Security.” Intel/Lenovo Booth at the IEEE/ACM Supercomputing Conference. Nov. 18-21, Denver, CO. 2019.
- [10] **Ranga Raju Vatsavai.** “AI and ML for Remote Sensing: Applications and Algorithms.” IISA International Conference on statistics December 26th - 30th, 2019. Victor Menezes Convention Center, IIT Bombay, Mumbai, India.
- [11] **Ranga Raju Vatsavai.** “AI + EO = Digital Agriculture: Applications and Opportunities.” Farm to Table Working Group’s Workshop. NCSU, Raleigh. Feb. 22-23, 2018.
- [12] **Ranga Raju Vatsavai.** “Spatiotemporal Computing at the Edge.” USGIF’s GEOINT, Tampa Convention Center, FL. April 22-25. 2018.
- [13] **Ranga Raju Vatsavai.** “Characterizing Irregular Settlements Using Machine Learning and Satellite Imagery: Case Study of Bengaluru, Karnataka, India.” One way ticket - New migrants, emerging settlements and stickiness with Bengaluru Slums, A Workshop co-hosted by the Omidyar Network (India) and the Center for Public Policy, IIM Bangalore. July 23, 2018.
- [14] **Ranga Raju Vatsavai and Erik Wibbels.** “Mapping and Studying the Slums of Bengaluru.” R. L. Rabb Science and Society Symposium on Urban Sustainability in Latin America and South Asia. NCSU, Raleigh. Sept. 20-22, 2018.
- [15] **Ranga Raju Vatsavai.** “Scaling Deep Learning for Crop Classification.” Intel/Lenovo Booth at the IEEE/ACM Supercomputing Conference. Nov. 12-15, Dallas, TX. 2018.
- [16] **Ranga Raju Vatsavai.** “Data Mining and Machine Learning at Scale.” NCSU-Lenovo Collaboration on Setting up AI Lab, NCSU, March 2. 2017.
- [17] **Ranga Raju Vatsavai.** “Mining Global Earth Observations: Applications, Algorithms, and Challenges.” SDM Workshop on Mining Big Data in Climate and Environment. April 29, 2017. Houston, TX.
- [18] **Ranga Raju Vatsavai.** “EOS + ML + UAS = Smart Agriculture.” North Carolina Biotechnology Center (NCBiotech) and the AgBiotech Initiative’s Professional Forum, April 26. 2017.
- [19] **Ranga Raju Vatsavai.** “Mining Global Earth Observations: Applications, Algorithms, and Challenges.” NCSU-EE Interdisciplinary Distinguished Seminar Series, August 25, 2017.
- [20] **Ranga Raju Vatsavai.** “Heterogeneous Geospatial Data Fusion and Analytics.” NextGEO Summit: Mapping the Research and Development Needs for the Next-Generation Geospatial Analytics. PNNL, Seattle, WA, USA. 9/14/17.
- [21] **Ranga Raju Vatsavai.** “Digital Agriculture: New Applications and Opportunities.” RTP AgBio + AgTech (Agriculture and Robotics Forum), 2017.
- [22] **Ranga Raju Vatsavai.** “Real-time Machine Learning.” NSF Aspiring CPS PIs Workshop, 2017.
- [23] **Ranga Raju Vatsavai.** “Global Earth Observations for Monitoring Critical Resources.” Invited talk at the Geospatial Data, Governance and the Future of Development Aid Workshop, Duke University, February 4-5, 2016.
- [24] **Ranga Raju Vatsavai.** “Remote Sensing Big Data Mining Framework for Monitoring Global Resources.” NSF Workshop on Geospatial Data Science, UIUC, IL. 7/25/16.

- [25] **Ranga Raju Vatsavai.** “Cyber Enabled Knowledge Discovery Framework for Food, Energy, and Water Security.” NSF Workshop on Food Energy Water Research Cyberinfrastructure, UCGIS, Scottsdale, AZ. 5/22/16.
- [26] **Ranga Raju Vatsavai.** “Big Data: Restoring Degraded Watersheds and Ecosystems.” Invited talk at the Technology for America’s Water Future, Disruptive Resilience: Chief Technology Officers Map America’s 2030 Water Future, California, February 29, 2016.
- [27] **Ranga Raju Vatsavai.** Lightning Talk on “Intertwining Computational Steering with Geosimulations.” UCGIS Research Challenges Initiative at UCGIS Summer Assembly, Scottsdale, AZ. 2016.
- [28] **Ranga Raju Vatsavai.** “Towards a food-energy-water-nexus data and data science community.” Invited panel talk at the 16th National Conference and Global Forum on Science, Policy, and Environment: Food-Energy-Water Nexus Conference, DC, January 19-21, 2016.
- [29] **Ranga Raju Vatsavai.** “Global Earth Observations Based Data Mining Framework for Food, Energy, and Water (FEW) Security.” Invited talk at the Emerging Plant Disease and Global Food Security Conference, Raleigh, March 23-24, 2016.
- [30] **Ranga Raju Vatsavai.** “Global Earth Observations Based Machine Learning Framework for Monitoring Critical Natural and Man-made Infrastructure.” NASA Machine Learning Workshop, NASA Langley Research Center, VA. August 16-18, 2016
- [31] **Ranga Raju Vatsavai.** “A View From Space - Remote Sensing Applications in Water, Food, and Energy Security.” Invited talk at NSF Expeditions Fifth Workshop on Understanding Climate Change from Data, University of Minnesota, August 04-05, 2015.
- [32] **Ranga Raju Vatsavai.** “Multitemporal Data Mining: From Biomass Monitoring to Nuclear Proliferation Detection.” **Keynote** 8th International Workshop on the Analysis of Multitemporal Remote Sensing Images July 22-24, 2015. Annecy, France.
- [33] **Ranga Raju Vatsavai.** “A View From Space: Remote Sensing Based Monitoring Framework for Water, Food, and Energy Security (Invited Position Paper).” NSF Workshop to Identify Interdisciplinary Data Science Approaches and Challenges to Enhance Understanding of Interactions of Food Systems with Energy and Water Systems, NIFA, D.C, October 05-06, 2015.
- [34] **Ranga Raju Vatsavai,** B. Bhaduri. Geospatial Analytics for Big Spatiotemporal Data: Algorithms, Applications, and Challenges. NSF Workshop on Big Data and Extreme-Scale Computing. Charleston, SC. (2013)
- [35] **Ranga Raju Vatsavai.** “Recent Advances in Classification and Monitoring Using Very High Resolution Imagery.” XVI Brazilian Remote Sensing Symposium (SBSR) (April 17, 2013).
- [36] **Ranga Raju Vatsavai.** “Monitoring At Scale: Recent Advances in Data Mining for Remote Sensing.” Emerging Researchers Enclave, ICVGIP 2012, IIT-Bombay.
- [37] **Ranga Raju Vatsavai.** “Large Scale Remote Sensing Data Mining: Recent Progress in Biomass Monitoring and Change Characterization.” NASA Earth Science Information Partnership (ESIP) Federation Meeting, 2010.
- [38] **Ranga Raju Vatsavai.** “Large Scale Spatiotemporal Data Mining for Bioenergy.” Fall Creek Falls Meeting, 2009.
- [39] **Ranga Raju Vatsavai,** Shashi Shekhar, and Thomas E. Burk. “Adopting Semi-supervised Learning Algorithms for Mining Remote Sensing Imagery: Summary of Results and Open Research Problems.” In Second NASA Data Mining Workshop. May 23-24, 2006, Pasadena, CA. 2006.
- [40] **Ranga Raju Vatsavai,** Shashi Shekhar, and Thomas E. Burk. “*Miner: A Suit of Classifiers for Spatial, Temporal, Ancillary, and Remote Sensing Data Mining.” In Second NASA Data Mining Workshop. May 23-24, 2006, Pasadena, CA. 2006.

- [41] Shashi Shekhar and **Ranga Raju Vatsavai**. “Spatial data mining research.” Specialist Meeting on Spatial Data Analysis Software Tools, May, 2002. Center for Spatially Integrated Social Science (CSISS), Santa Barbara, CA.
- [42] Shashi Shekhar and **Ranga Raju Vatsavai**. “Spatial data mining research.” NSF workshop on Spatio-temporal Data Models for Biogeophysical Fields, April, 2002. San Diego Supercomputer Center, La Jolla, California.

Presentations (50+ international conferences and workshops)

- IEEE Geoscience and Remote Sensing Symposium (IGARSS: 2008, 2009, 2010, 2011, 2012, 2013, and 2014)
- ACM SIGKDD 19th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD-2013)
- ACM International Symposium on Advances in Geographic Information Systems (ACMGIS: 2000, 2001, 2008, 2009, and 2012)
- International Conference on Computational Science (ICCS: 2009, and 2012)
- IEEE International Conference on Data Mining (Industry track: 2012, Demo: 2012)
- International Conference and Exhibition on Computing for Geospatial Research & Application (COM.Geo: 2010, 2011, and 2012)
- Applied Imagery Pattern Recognition (AIPR: 2007, 2008, 2009, 2010, and 2012)
- NASA Conference on Intelligent Data Understanding (CIDU: 2008 and 2010)
- ACM SIGKDD Workshop on Knowledge Discovery from Sensor Data (SensorKDD: 2009)
- 17th William T. Pecora Memorial Remote Sensing Symposium (2008)
- IEEE ICDM Workshop on Spatial and Spatiotemporal Data Mining (SSTDM: 2007, 2008, and 2009)
- IEEE Intl. Conference on Tools with AI (ICTAI: 2005, 2008)
- International Conference on GIS (GIScience: 2004, 2008)
- Fifth International Conference on Information Technology: New Generations (ITNG: 2008)
- 2nd ICA Workshop on Geospatial Analysis and Modeling (2007)
- 7th IEEE Workshop on Policies for Distributed Systems and Networks (Policy: 2006)
- 2nd NASA Data Mining Workshop (2006)
- Pattern Recognition for Remote Sensing (ICPR workshop: 2002)
- University Consortium for Geographic Information Science: Summer Assembly (UCGIS: 2002)
- Scientific and Statistical Database Management (SSDBM: 2001)
- NSF Workshop on Integrated Spatial Databases: Digital Images and GIS (ISD: 1999)

Professional Activities

Editorial Board

- Action Editor: Springer’s “*GeoInformatica: An International Journal on Advances of Computer Science for Geographic Information Systems*,” 2012 - present.
- Editorial board member: InderScience’s “International Journal of Information and Decision Sciences – *IJIDS: 2010-2012*”

Journal Reviewer

- Nature Scientific Reports
- IEEE Computing in Science & Engineering
- Data Mining and Knowledge Discovery (DMKD)
- IEEE Transactions on Neural Networks (IEEE TNN)
- IEEE Transactions on Knowledge and Data Engineering (IEEE TKDE)
- IEEE Transactions on Geoscience and Remote Sensing (IEEE TGRS)
- GeoInformatica - An International Journal on Advances of Computer Science for Geographic Information Systems (GeoInformatica)
- Knowledge and Information Systems, An International Journal (KAIS)
- International Journal on Geographical Information Science (IJGIS)
- GeoJournal: An international journal on human geography and environmental sciences
- Journal of computing in civil engineering
- The Computer
- Transactions on Internet Technology

Conference Reviewer

- Reviewing on average more than 20 papers per year for various international conferences (including KDD, SDM, ACM SIGSPATIAL GIS, ECML/PKDD, AAAI)

Session chair

- ACM International Symposium on Advances in Geographic Information Systems (ACMGIS)
- ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD)
- ACM SIGKDD Workshop on Knowledge Discovery from Sensor Data (SensorKDD)
- IEEE ICDM International Workshop on Spatial and Spatiotemporal Data Mining (SSTDM)
- International Workshop on Computational Transportation Science (IWCTS)

Program Committee

- European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML/PKDD: 2017-)
- AAAI Conference on Artificial Intelligence (AAAI: 2018-)
- SIAM International Conference on Data Mining (SDM: 2009, 2013, 2020)
- IEEE International Conference on Data Mining (ICDM: 2020)
- ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD IG/Data Science/Research: 2005, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016)
- ACM International Symposium on Advances in Geographic Information Systems (ACMGIS: 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018)
- IEEE Big Data Congress (2015, 2016, 2020)

- IEEE International Conference on Big Data (IEEE BigData: 2013)
- 8th International Workshop on the Analysis of Multitemporal Remote Sensing Images (2015).
- 11th International Conference on Innovations in Information Technology (IIT-2015).
- ASE/IEEE International Conference on Big Data (BIGDATA: 2013)
- ACM International Conference on Information and Knowledge Management (CIKM: 2013, 2020)
- IEEE International Conference on Tools with Artificial Intelligence (ICTAI: 2007, 2008)
- European Conference on Data Mining (2008)
- International Workshop on Knowledge Discovery from Ubiquitous Data Streams (2007, 2008)
- ACM CIKM Workshop for Ph.D. Students in Information and Knowledge Management (PIKM: 2008)

Panel/Committee

- “Machine Vision Panel.” USAID Big Data and Machine Learning for Development workshop, 2019.
- “Panel 2: Big Data in Industry and Government - Challenges, Requirements and Constraints.” IEEE 2016 Big Data Conference.
- “Envisioning 2020 Spatial Research.” *12th International Symposium on Spatial and Temporal Databases (SSTD)*. (Led to the follow on NSF/CRA/CCC sponsored *Visioning Activity on Spatial Computing*. (2011).
- “Early Career: Challenges and Opportunities.” *12th International Symposium on Spatial and Temporal Databases (SSTD)*. (2011).
- “Emerging Geospatial Science and Technology for Sustainable Bioenergy” at the *1st International Conference and Exhibition on Computing for Geospatial Research and Application (COM.Geo)*, Washington DC., ACM 2010.
- Served as judge for best poster and Ph.D. paper awards (ACM GIS: 2008, 2009).
- Served on more than fifteen National Science Foundation Panels (NSF: 2008-2020).
- Panels at the Department of Energy (DOE)
- Panels at the National Aeronautics and Space Administration (NASA).
- Reviewed research proposals for several government agencies (NSF, NGA, DOE/NA-22).
- Expert committee member on ‘site acceptance test’ of a multi-million dollar Digital Mapping, GIS, and Photogrammetry System installation at the NFDMC, Forest Survey of India, Ministry of Environment and Forests, Government of India, Dehradun, 1997.

Tutorials/Short Courses

- Short courses on *deep learning, graph analytics, text analytics, and time series analysis* for Cisco through NCSU Executive Education program (2019-).
- Short courses on *introduction to machine learning and multivariate clustering* for Infosys through NCSU Executive Education program (2019-).
- Short courses on *applied statistics for developers using Python* for LexisNexis through NCSU Executive Education program (2019-).
- Two day tutorial on “Introduction to Data Mining and Machine Learning.” Data Matters (Hosted by Odum Institute, UNC). (2016 and 2017).
- Invited tutorial on “Spatial Data Mining” at the PUC-Rio, Brazil (April 2013).
- Organized and co-taught a full day tutorial on “Advanced Classification Techniques for Remote Sensing” at the IEEE Geoscience and Remote Sensing Symposium (IGARSS: 2009, 2010, 2011 and 2012).

- Gave tutorial on “Modeling spatial dependencies and semantic concepts in data mining” at the 3rd International Conference on Computing for Geospatial Research and Applications (COM.Geo: 2012).
- Organized and taught a full day tutorial on “Advanced Classification” at the 17th William T. Pecora Memorial Remote Sensing Symposium (Pecora: 2008).