

Auroop R Ganguly

Senior R&D Staff, Oak Ridge National Laboratory & Joint Faculty, University of Tennessee at Knoxville

Email: gangulyar@ornl.gov; Internet: <http://www.ornl.gov/knowledgediscovery/ClimateExtremes>

Education

Massachusetts Institute of Technology	Ph.D.	Civil and Environmental Engineering	2002
University of Toledo	M.S.	Civil Engineering	1997
Indian Institute of Technology	B. Tech. (Hons.)	Civil Engineering	1993

Primary Research and Professional Experience

Oak Ridge National Laboratory (ORNL): Senior R&D Staff (Now), R&D Staff, R&D Assoc.	2004-Now
University of Tennessee, Knoxville (UTK): Joint Faculty, Civil & Environmental Engineering	2010-Now
: Adjunct Faculty, Information & Industrial Eng.	2006-Now
University of South Florida, Tampa (USF): Visiting Faculty, Civil & Environmental Eng.	2003-2004
Demantra Inc. (now acquired by Oracle): Senior Product Manager for Analytics & Strategy	2003-2003
Oracle Corporation: Product Manager–Demand Planning, E-Business Applications Suite	1999-2003
: Time Series Software Developer, Server Technologies	1998-1999
Massachusetts Institute of Technology: Voluntary Researcher, Sloan School of Management	1997-2003
: Graduate Research Assistant, Civil and Environ. Eng.	1995-1998

Selected Awards and Recognition

Research Highlight (for paper in <i>Geophysical Research Letters</i>) in journal <i>Nature</i>	2011
Research Highlight (for paper in <i>Geophysical Research Letters</i>) in journal <i>Nature Climate Change</i>	2011
Invited Speaker, Grand Challenges Workshop, <i>International Conference on Machine Learning</i>	2011
Outstanding Joint/Adjunct/Research Faculty Award, CEE Annual Awards Banquet, UTK	2011
Reviewer for IPCC Fifth Assessment Report’s Special Report on Extremes (SREX)	2011
ORNL Significant Event Award for Novel Analysis of Climate Model Simulations	2010
Best Doctoral Student Poster by PhD Advisee at SIAM International Conference on Data Mining	2010
Conference paper selected as among the best of NASA <i>Conf. Intelligent Data Understanding</i>	2010
Awarded 5-year \$10M NSF “Expeditions in Computing” award as Co-PI	2010
Awarded 5-year \$10M US DOE Office of Science award as senior person	2010
Session Chair for AGU sessions on climate extremes and uncertainty	2010
Invited for <i>United Nations Environmental Programme</i> (UNEP) review panel	2010
Member of invited reader panel of journal <i>Nature</i> for 2-terms	2010
ORNL Science Lead for climate support to US DOD’s 2010 <i>Quadrennial Defense Review</i> report	2009
Paper as lead and first author published and highlighted in <i>Proc. of the Nat’l Academy of Sciences</i>	2009
ORNL Significant Event Award for Science Support of Climate Change War Games	2009
Best Student Paper Award by Doctoral Advisee at ACM KDD Workshop	2009
Invited presenter at Environmental Carrying Capacity Workshop at Carnegie Mellon University	2009
Advisory Board and Invited Presenter at NSF-funded <i>Next Generation Data Mining Workshop</i>	2009
Joint Editor of Special Issue of journal <i>Intelligent Data Analysis</i>	2009
Associate Editor (till present) of ASCE’s <i>Journal of Computing in Civil Engineering</i>	2008
US Department of Energy Outstanding Mentor Award for mentoring graduate student	2008
ORNL Significant Event Award for contributions to DARPA (IPTO) funded project	2008
Published paper in <i>Advances in Water Resources</i> ranked among “hottest” in terms of downloads	2007
Runner-up Student Paper Award by Student Collaborator at ACM KDD Workshop	2007
ORNL Outstanding Mentor Award for mentoring senior undergraduate / graduate student	2006
Abstract and presentation selected for <i>American Geophysical Union</i> press conference	2006

Peer-Reviewed Journal Publications (*Current or former direct advisee or mentee)

1. Steinhäuser, K.*, Chawla, N.V., and A.R. Ganguly (2011): *Complex networks as a unified framework for descriptive analysis and predictive modeling in climate science*. **Statistical Analysis and Data Mining**, DOI: 10.1002/sam.10100.
Research Highlight in ORNL press and the media
2. Omitaomu, O.A.*, Protopopescu, V.A., and A.R. Ganguly (2011): *Empirical mode decomposition technique with conditional mutual information for denoising operational sensor data*. **IEEE Sensors Journal**, DOI: 10.1109/JSEN.2011.2142302.
3. Steinhäuser, K.S.*, A.R. Ganguly, and N. Chawla, N. (2011): *Multivariate and multi-scale dependence in the global climate system revealed through complex networks*. **Climate Dynamics**, DOI: 10.1007/s00382-011-1135-9.
4. Kao, S.C.*, and A.R. Ganguly (2011): *Intensity, duration, and frequency of precipitation extremes under 21st-century warming scenarios*. **Journal of Geophysical Research – Atmospheres**, DOI: 10.1029/2010JD015529.
Research Highlight in ORNL press and the media
5. Kodra, E.*, Steinhäuser, K.S.*, and A.R. Ganguly (2011): *Persisting cold spells in the 21st-century warming environment*. **Geophysical Research Letters**, 38, L08705, 5 pp.
Research Highlight in *Nature* and *Nature Climate Change* and the media
6. Kodra, E.*, Chatterjee, S., and A.R. Ganguly (2011): *Exploring Granger causality between global average observed time series of carbon dioxide and temperature*. **Theoretical and Applied Climatology**, 104(3-4): 325-335.
7. Steinhäuser, K.*, Chawla, N.V., and A.R. Ganguly (2010): *An exploration of climate data using complex networks*. **ACM SIGKDD Explorations**, 12(1): 25-32.
8. Huang, C., Hsing, T., Cressie, N., Ganguly, A.R., Protopopescu, V.A., and N.S. Rao (2010): *Bayesian sources detection and parameters estimation of plume model based on sensor network measurements*, **Applied Stochastic Models in Business and Industry**, 26(4): 331-348.
9. Huang, C., Hsing, T., Cressie, N., Ganguly, A.R., Protopopescu, V.A., and N.S. Rao (2010): *'Bayesian source detection and parameter estimation of a plume model based on sensor network measurements' by C. Huang et al.: Rejoinder*. **Applied Stochastic Models in Business and Industry**, 26(4): 331-348.
10. Ganguly, A.R., Steinhäuser, K.*, Erickson, D.J., Branstetter, M., Parish, E.S.*, Singh, N., Drake, J.B. and L. Buja (2009): *Higher trends but larger uncertainty and geographic variability in 21st century temperature and heat waves*. **Proceedings of the National Academy of Sciences of the United States of America**, 106(37): 15555-15559.
Research Highlight in *PNAS*, *La Scienza*, scientific venues, and the media
11. Agovic, A., Banerjee, A., Ganguly, A. and V. Protopopescu (2009): *Anomaly detection using manifold embedding and its applications in transportation corridors*. **Intelligent Data Analysis**, 13(3): 435-455.
12. Omitaomu, O.A.*, Ganguly, A.R., Patton, B.W., and V.A. Protopopescu (2009): *Anomaly detection in radiation sensor data with application to transportation security*, **IEEE Transactions on Intelligent Transportation Systems**, 10(2): 324-334.

Research Highlight in ORNL press and the media

13. Zhang, J., R.R. Murch, M.A. Ross, A.R. Ganguly and M. Nachabe (2008): *Evaluation of statistical rainfall disaggregation methods using rain-gauge information for West-Central Florida*, **Journal of Hydrologic Engineering**, 13(12): 1158-1169.
14. Khan, S.*, S. Bandyopadhyay, A.R. Ganguly, S. Saigal, D. J. Erickson, III, V. Protopopescu, and G. Ostrouchov (2007): *Relative performance of mutual information estimation methods for quantifying the dependence among short and noisy data*, **Physical Review E**, 026209.
15. Kuhn, G.*, Khan, S.*, Ganguly, A.R., M. Branstetter (2007): *Geospatial-temporal dependence among weekly precipitation extremes with applications to observations and climate model simulations in South America*, **Advances in Water Resources**, 30(12): 2401-23.
Top 25 hottest papers and highlighted in ORNL press and the media
16. Khan, S.*, Kuhn, G.*, Ganguly, A.R., Erickson, D.J., and G. Ostrouchov (2007): *Spatio-temporal variability of daily and weekly precipitation extremes in South America*, **Water Resources Research**, 43, W11424.
17. Gupta, A.; Seshasai, S.; Mukherji, S.; Ganguly, A. (2007): *Offshoring: The transition from economic drivers toward strategic global partnership and 24-hour knowledge factory*, **Journal of Electronic Commerce in Organizations**, 5(2): 1-23.
Highlighted (along with similar papers) in multiple venues
18. Sabesan, A.*, Abercrombie, K.*, Ganguly, A.R., Bhaduri, B.L., Bright, E.A., and P. Coleman (2007): *Metrics for the comparative analysis of geospatial datasets with applications to high resolution grid-based population data*, **GeoJournal**, 30, 2401-2423.
19. Khan, S.*, A.R. Ganguly, S. Bandyopadhyay, S. Saigal, D. J. Erickson, III, V. Protopopescu, and G. Ostrouchov (2006): *Nonlinear statistics reveals stronger ties between ENSO and the tropical hydrological cycle*, **Geophysical Research Letters**, 33, L24402.
Research Highlight in ORNL press and the media
20. Samatova, N., Branstetter, M., Ganguly, A.R., Hettich, R., Khan, S. *, Kora, G., Li, J., Ma, X., Pan, C., Shoshani, A., and S. Yoginath (2006): *High performance statistical computing with parallel R: Applications to biology and climate*, **Journal of Physics: Conference Series** 46 (2006), 505-509.
21. Khan, S.*, Ganguly, A.R., and Saigal, S. (2005): *Detection and predictive modeling of chaos in finite hydrological time series*. **Nonlinear Processes in Geophysics**, 12: 41-53.
22. Ganguly, A.R., and R.L. Bras (2003): *Distributed quantitative precipitation forecasting using information from radar and numerical weather prediction models*, **Journal of Hydrometeorology**, 4 (6): 1168-180.
23. Ganguly, A. R. (2002): *A hybrid approach to improving rainfall forecasts*, **Computing in Science and Engineering**, IEEE and AIP, 4(4), 14-21, July/August.
24. Reyes-Aldasoro, C.C., Ganguly, A.R., Lemus, G., and A Gupta (1999): *A hybrid model based on dynamic programming, neural networks, and surrogate value for inventory optimization applications*. **Journal of the Operational Research Society**, 50(1), 85-94.

Peer-Reviewed Journal Publications: In Review (*Current or former direct advisee or mentee*)

25. Ghosh, S.* , Das, D.* , Kao, S.-C.* , and A.R. Ganguly (2011): *Rainfall extremes over India exhibit increasing spatial variability but no uniform trends* (Under review).
26. Ganguly, A.R., Ghosh, S.* , E. Kodra* (2011): *Regional climate assessments benefit from process-based evaluation of global models*, (Under review).
27. Cody, L., Tootle, G.A., Kodra, E.A.* , and A.R. Ganguly (2011): *The North Platte river basin: Past, present, and future patterns and extremes in streamflow*, (Under review).
28. Ganguly, A.R., Kao, S.-C.* , Steinhäuser, K.* , Parish, E.S.* , Sorokine, A., Erickson, D.J., Branstetter, M., N. Singh (2009): *Challenges and opportunities in translating climate model simulations to actionable predictive insights for water resources decisions*, (Under review).

Peer-Reviewed Journal Manuscript: To be Submitted (*Current or former direct advisee or mentee*)

29. Parish, E.S.* , and A.R. Ganguly (2011): *Dependence of 21st century water availability scenarios on global population and climate change*, (Under Preparation).

Peer-reviewed Edited Books (*Current or former direct advisee or mentee)

30. Gaber, M.M., Vatsavai, R.R., Omitaomu, O.A. *, Gama, J., Chawla, N.V., and A.R. Ganguly (Editors) (2010): **Knowledge Discovery from Sensor Data**. Laboratory Notes for Computer Science, Springer, Berlin (Germany): 227 pages.
31. Ganguly, A.R., Gama, J., Omitaomu, O.A. *, Gaber, M.M., and R.R. Vatsavai (Editors) (2009): **Knowledge Discovery from Sensor Data**. CRC Press, Taylor & Francis, New York: 216 pages.

Cited in **Wikipedia** article on Data Stream Mining

Peer-Reviewed Editorials and Reports (*Current or former direct advisee or mentee)

32. Chandola, V., Omitaomu, O.A. *, Ganguly, A.R., Gama, J., Chawla, N.V., Gaber, M.M., and A.R. Ganguly (2010): *Knowledge Discovery from Sensor Data (SensorKDD)*. **ACM SIGKDD Explorations** 12(2): 50-53.
33. Omitaomu, O.A. *, Ganguly, A.R., Gama, J., Chawla, N.V., Gaber, M.M., and A.R. Ganguly (2009): *Knowledge Discovery from Sensor Data (SensorKDD)*. **ACM SIGKDD Explorations** 11(2): 84-87.
34. Gama, J., Ganguly, A.R., Omitaomu, O.A. *, Vatsavai, R.R., and M.M. Gaber (2009): *Knowledge discovery from data streams*. **Intelligent Data Analysis** 13(3): 403-404.
35. Vatsavai, R.R., Omitaomu, O.A. *, Gama, J., Chawla, N.V., Gaber, M.M., and A.R. Ganguly (2008): *Knowledge Discovery from Sensor Data (SensorKDD)*. **ACM SIGKDD Explorations** 10(2): 68-73.
36. Ganguly, A. R. (2002): *Software Review – Data Mining Components*. **OR/MS Today**, Institute for Operations research and the Management Sciences (INFORMS), 29(5), 56-59, October.

Editor of Peer-reviewed Workshop Proceedings (*Current or former direct advisee or mentee*)

37. Omitaomu, O.A.*, Ganguly, A.R., Vatsavai, R.R., Gama, J., Gaber, M.M., and N.V. Chawla [Proceedings Editors and Workshop Organizers] (2010): *Workshop Proceedings, **Fourth International Conference on Knowledge Discovery from Sensor Data (Sensor-KDD'10)***, 16th Int'l Conference on Knowledge Discovery and Data Mining (KDD 2010), Washington, DC, July.
38. Bhat, C., Ganguly, A., Gehrke, J., Giannella, C., McGranahan, M., and P. Melby [Reports Committee] with Dietterich, T., Gomes, C., Kargupta, H., Kumar, V., Srivastava, A., and P. Yu [Steering Committee] (2009): *National Science Foundation Summit on the Next Generation of Data Mining for Dealing with Energy, Greenhouse Emissions, and Transportation Challenges (NGDM'09)*, Report submitted to the **National Science Foundation**, 28 pages.
39. Chawla, N.V., Ganguly, A.R., Kumar, V., Steinbach, M., and K. Steinhaeuser* [Proceedings Editors and Workshop Organizers] (2009): **Knowledge Discovery from Climate Data: Prediction, Extremes, and Impacts**, IEEE Int'l Conference on Data Mining (ICDM), Miami, FL, December.
40. Omitaomu, O.A.*, Ganguly, A.R., Vatsavai, R.R., Gama, J., Gaber, M.M., and N.V. Chawla [Proceedings Editors and Workshop Organizers] (2009): *Workshop Proceedings, **Third International Conference on Knowledge Discovery from Sensor Data (Sensor-KDD'09)***, 15th Int'l Conference on Knowledge Discovery and Data Mining (KDD 2009), Paris, France, July.
41. Vatsavai, R.R., Omitaomu, O.A.*, Gama, J., Gaber, M.M., Chawla, N.V., and Ganguly, A.R., [Proceedings Editors and Workshop Organizers] (2008): *Workshop Proceedings, **Second International Conference on Knowledge Discovery from Sensor Data (Sensor-KDD'08)***, 14th Int'l Conference on Knowledge Discovery and Data Mining (KDD 2008), Las Vegas, NV, August.
42. Ganguly, A.R., Gama, J., Omitaomu, O.A.*, Gaber, M.M., and R.R. Vatsavai [Proceedings Editors and Workshop Organizers] (2007): *Workshop Proceedings, **First International Conference on Knowledge Discovery from Sensor Data (Sensor-KDD'07)***, 13th International Conference on Knowledge Discovery and Data Mining (KDD 2007), San Jose, CA, August.

Peer-Reviewed Conference Publications (*Current or former direct advisee or mentee)

43. Steinhäuser, K. *, Chawla, N., and A. Ganguly (2011): *Comparing predictive power in climate data: clustering matters*. **12th International Symposium on Spatial and Temporal Databases**. Twin Cities, MN, USA, August 24-26, 2011 (Accepted).
44. Hoffman, F.M., Larson, J.W., Mills, R.T., Brooks, B.J., Ganguly, A.R., Hargrove, W.W., Huang, J., Kumar, J., and R.R. Vatsavai (2011): *Data Mining in Earth System Science (DMESS 2011)*. **Proceedings of the International Conference on Computational Science, ICCS 2011**, Nanyang Technological University, Singapore, 1-3 June 2011.
45. A. Pelan, K. Steinhäuser*, N. V. Chawla, D. A. de Alwis Pitts and A.R. Ganguly (2011). *Empirical Comparison of Correlation Measures and Pruning Levels in Complex Networks Representing the Global Climate System*. **IEEE Symposium Series on Computational Intelligence and Data Mining (CIDM)**, Paris, France.
46. Race, C., Steinbach, M., Ganguly, A., Semazzi, F., and V. Kumar (2010): *A knowledge discovery strategy for relating sea surface temperatures to frequencies of tropical storms and generating predictions of hurricanes under 21st-century global warming scenarios*. **NASA Conference on Intelligent Data Understanding**, National Aeronautics and Space Administration, San Francisco, CA, USA, October 5-7, 2010.
47. Steinhäuser, K. *, Chawla, N.V., and A.R. Ganguly (2010): *Complex networks in climate science: Progress, opportunities and challenges*, **NASA Conference on Intelligent Data Understanding**, National Aeronautics and Space Administration, San Francisco, CA, USA, October 5-7, 2010.
48. Ganguly, A.R., Steinhäuser, K. *, Kao, S.-C. *, Parish, E.S. *, Branstetter, M., Sorokine, A., Erickson III, D.J., and A.W. King (2009): *Trends and geographical variability in hydro-meteorological extremes for the 21st century from a climate model*, **3rd International Perspective on Current & Future State of Water Resources & the Environment**, Environmental Water Resources Institute (EWRI) of the American Society of Civil Engineers (ASCE), Chennai, India, January 5-7, 2010 (Invited).
49. Ganguly, A.R., Steinhäuser, K. *, Kao, S.-C. *, E.S. Parish* (2009): *Climate extremes: The science, impacts, and policy relevance*, **3rd International Perspective on Current & Future State of Water Resources & the Environment**, Environmental Water Resources Institute (EWRI) of the American Society of Civil Engineers (ASCE), Chennai, India, January 5-7, 2010 (Invited).
50. Kao, S.-C. *, Ganguly, A.R., and K. Steinhäuser* (2009): *Motivating complex dependence structures in data mining: Case study with anomaly detection in climate data*, **9th IEEE International Conference on Data Mining - Workshops (ICDMW'09)**.
51. Erickson, D., Daniel, J., Allen, M., Ganguly, A., Hoffman, F., Pawson, S., Ott, L., and E. Neilson (2009): *Data mining geophysical content from satellites and global climate models*, **9th IEEE International Conference on Data Mining – Workshop (ICDMW'09)**.
52. Ganguly, A.R., Steinhäuser, K. *, Sorokine, A., Parish, E.S. *, Kao, S.-C. *, and M.L. Branstetter (2009): *Demo Paper: Geographic Analysis & Visualization of Climate Extremes for the Quadrennial Defense Review*, **17th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems**.

53. Walker, R.M., Kopsick, D.A., Gorman, B.L., Ganguly, A.R., Mitch, F., and Shankar, M. (2009): *Global radiological source sorting, tracking, and monitoring (GRADSSTRAM) using emerging RFID and Web 2.0 technologies to provide total asset and information visualization*, **50th Annual INMM Conference**, Tuscon, AZ.
54. Steinhäuser, K.* , Chawla, N.V., and A.R. Ganguly (2009): *An exploration of climate data using complex networks*. **3rd International Workshop on Knowledge Discovery from Sensor Data**, 15th ACM SIGKDD Conference on Knowledge Discovery and Data Mining, *Best Student Paper Award*.
55. A.R. Ganguly, O.A. Omitaomu*, and J. Yu (2009): *Information-Theoretic Approaches for Evaluating Complex Adaptive Social Simulation Systems*. **Proceedings of the Human Behavior-Computational Intelligence Modeling Conference**, Oak Ridge, TN, June 23–24.
56. K. Steinhäuser*, N.V. Chawla, A.R. Ganguly, *Discovery of Climate Patterns with Complex Networks*, **International Conference on Network Science (NetSci)**, Venice, Italy, June 2009.
57. K. Steinhäuser*, N.V. Chawla, A.R. Ganguly (2009): *Descriptive and Predictive Analysis of Climate Data*, **SIAM International Conference on Data Mining (SDM)**, Sparks, NV, April-May, *Best Poster Award for Doctoral Forum Presentation*.
58. A. R. Ganguly and K.J. Steinhäuser* (2008): *Data Mining for Climate Change and Impacts*, **Eighth IEEE International Conference on Data Mining – Workshops (ICDMW'08)**.
59. Ganguly, A.R. and B.L. Bhaduri (2008): *Towards Secure Transportation Corridors: A GIS-based Framework for Knowledge Discovery*, **GIS for Transportation Symposium**, Houston, TX, March.
60. Li, H.* , Fernandez, S. and A.R. Ganguly (2008): *Racial Segregation, Economic Growth, and Natural Disaster Resilience*, **The North American Regional Science Council**, Annual Meeting, New York, November.
61. Walker, R.M., Omitaomu*, O., Ganguly, A.R., Abercrombie, R.K., and F.T. Sheldon (2008): *Multimodal Integrated Safety, Security, and Environmental Program Strategy*, **Transportation Research Board**, 87th Annual Meeting, January 2008, Washington, DC, 08-2644.
62. A.R. Ganguly, O.A. Omitaomu*, V. Protopopescu, B. Patton, R. Walker, Y. Fang, A. Agovic, and A. Banerjee (2007): *Anomaly Detection from Heterogeneous Sensor Data with Application to Transportation Security*, **2007 National Rural Intelligent Transportation Systems Conference**, Oct. 7-10, Traverse City, Michigan.
63. Agovic, A., Banerjee, A., Ganguly, A.R., and V.A. Protopopescu (2007): *Non-Linear Anomaly Analysis with Applications to Transportation Corridors*. The First International Workshop on Knowledge Discovery from Sensor Data, **The 13th International Conference on Knowledge Discovery and Data Mining**, San Jose, CA, August: *Runner-Up Best Student Paper Award*.
64. Fang, Y.* , and Ganguly, A.R. (2007): *Mixtures of Probabilistic Principal Component Analyzers for Anomaly Detection*. The First International Workshop on Knowledge Discovery from Sensor Data, **13th International Conference on Knowledge Discovery & Data Mining**, San Jose, CA, August.
65. Pan, C.-C., Mitra, P., and Ganguly, A.R. (2007): *Spatio-Temporal Analysis on FEMA Situation Updates with Automated Information Extraction*. The First International Workshop on Knowledge

Discovery from Sensor Data, **The 13th International Conference on Knowledge Discovery and Data Mining**, San Jose, CA, August: *Best Student Paper Award*.

66. Ganguly, A.R., Hsing, T., Katz, R., Erickson, D., Ostrouchov, G., Wilbanks, T., and N. Cressie (2005): *Multivariate dependence among extremes, abrupt change and anomalies in space and time for climate applications*, Proceedings of the Workshop on Data Mining for Anomaly Detection, **11th ACM SIGKDD Int'l Conference on Knowledge Discovery & Data Mining**, Chicago, IL, August.
67. Fang,, Y.*, A.R. Ganguly, N. Singh, V. Vijayaraj, N. Feierabend, D.T. Potere (2006): *Online change detection: Monitoring land cover from remotely sensed data*, **6th IEEE International Conference on Data Mining – Workshops (ICDMW'06)**.
68. Ganguly, A.R., Protopopescu, V.A., and A. Sorokine (2005): *A bottom-up strategy for uncertainty quantification in complex geo-computational models*. **GeoComputation 2005**, Ann Arbor, MI.
69. Mukherji, S., and A.R. Ganguly (2004): *Sustaining the offshore outsourcing boom for software development: transitioning from low-cost service providers to strategic partners for information systems*, **Proceedings of the 9th International Symposium on Logistics (9th ISL)**, Bangalore, India.

Peer-Reviewed Conference Publications: In Review (*Current or former direct advisee or mentee)

70. Kawale, J., Steinbach, M., Ganguly, A., and V. Kumar (2011): *Data-guided discovery of climate dipoles in observations and models*, (Under review: 2011 **NASA Conference on Intelligent Data Understanding**).
71. Faghmous, J.H., Liess, S., Ganguly, A., Steinbach, M., Semazzi, F., and V. Kumar (2011): *Data mining technique suggests a dynamic relationship between Atlantic sea surface temperatures and hurricanes*, (Under review: 2011 **NASA Conference on Intelligent Data Understanding**).
72. Kodra, E., Chatterjee, S., and A.R. Ganguly (2011): Challenges and opportunities toward improved data-guided handling of global climate model ensembles for regional climate change assessments, (Under review: 2011 **International Conference on Machine Learning – Workshop on Grand Challenges**).

Peer-Reviewed Book Chapters (*Current or former direct advisee or mentee)

73. Bhaduri, B., Shankar, M., Sorokine, A., and Ganguly, A.R. (2009) *Spatio-temporal visualization for environmental decision support*, In: Raffaele De Amicis, Radovan Stojanovic, Giuseppe Conti (Eds.), **GeoVisual Analytics: Geographical Information Processing and Visual Analytics for Environmental Security**, NATO Science for Peace and Security Series - C: Environmental Security. Springer.
74. Ganguly, A.R., Fang, Y.*, Khan, S.*, Omitaomu, O.A.*, and B.L. Bhaduri (2007). *Knowledge discovery from sensor data for scientific applications*. In: Gaber, M. and J. Gama (eds.), **Learning from Data Streams – Processing Techniques in Sensor Networks**, Springer-Verlag, pp. 205-229.
75. Ganguly, A.R., Omitaomu, O.A.* and R.M. Walker (2007). *Knowledge discovery from sensor data for security applications*. In: Gaber, M. and J. Gama (eds.), **Learning from Data Streams – Processing Techniques in Sensor Networks**, Springer-Verlag, pp. 187-204.
76. Khan, S.*, Ganguly, A. R., and A. Gupta (2007): *Data mining and data fusion for enhanced decision support*, **Handbook on Decision Support Systems I**, F. Burnstein and C.W. Holsapple (editors), Springer-Verlag, pp. 581-608.
77. Khan, S.*, Ganguly, A.R., and A. Gupta (2005): *Creating knowledge about the future through business forecasting and planning*, **Encyclopedia of Knowledge Management**, D. Schwartz (editor), Idea Group.
78. Ganguly, A.R., S. Khan*, and A. Gupta (2005): *Data mining and decision support for business and science*, **Encyclopedia of Data Warehousing and Mining**, J. Wang (editor), Idea Group.
79. Ganguly, A.R., and A. Gupta* (2005): *Framework for strategic IT decisions*, **The Handbook of Business Strategy**, P. Coate (editor), Emerald.
80. Ganguly, A. R. (2002): *Forecasting rainfall and floods – advances and way forward*, **Advances in Civil Engineering**, Volume I: Water Resources and Environmental Engineering (Bandopadhyay and Kumar, editors), Allied Publishers India, page 166-174.

Internal Peer-Reviewed Technical Reports (*Current or former direct advisee or mentee*)

81. Steinhäuser, K.*, Parish, E.*, Sorokine, A., and A.R. Ganguly (2009): *Projected State of the Arctic Sea Ice and Permafrost by 2030*, Tech Manual, ORNL/TM-2009/265, **Oak Ridge National Laboratory**.
82. Ganguly, A.R., Whitmeyer, J.M., Omitaomu, O.A.*, Hadzikadic, M., Gilman, P., Brecke, P.K., Khouja, M.J., Fernandez, S.J., Eichelberger, C.N., McLean, A.L., Yu, J., Middleton, E.J., Carmichael, T.D., Saric, A. and M. Sun (2008): *Towards a characterization and systematic evaluation framework for theories and models of human, societal, behavioral, and cultural processes*, ORNL/TM-2008/062, **Oak Ridge National Laboratory**.
83. Fernandez, Steven J., Brecke, Peter, Carmichael, Theodore D, Eichelberger, Christopher N, Ganguly, Auroop R, Hadzikadic, Mirsad, Jiao, Yu, Khouja, Moutaz J, McLean, Angus L, Middleton, Erin J, Omitaomu, Olufemi A.*, Saric, Amar, Sun, Min, Whitmeyer, Joseph M, Gilman, Paul, O'Maonaigh, Heather C (2008): *Actionable Capability for Social and Economic Systems (ACSES)*, ORNL/TM-2008/088, **Oak Ridge National Laboratory**.
84. Sabesan, A.*, Abercrombie, K.*, Ganguly, A.R., Bhaduri, B.L., Bright, E.A., and P. Coleman (2006): *Uncertainty in Population Estimates — A Comparison between GPW and LandScan Data Models*, ORNL/TM-2006/540, **Oak Ridge National Laboratory**.
85. Gerdes, D.A.*, Khan, S.*, and A.R. Ganguly (2006): *Nonlinear Dependence Measures with Application to Static Scale Data from the Watt Road Weigh Station*, ORNL/TM-2006/549, **Oak Ridge National Laboratory**.
86. Fang, Y.*, and A.R. Ganguly (2006): *Probabilistic Principal Component Analysis for Online Anomaly Detection with Application to Static Scale Data from the Watt Road Weigh Station*, ORNL/TM-2006/546, **Oak Ridge National Laboratory**.
87. Gabriel, K.*, and A.R. Ganguly (2006): *Geospatial-temporal dependence among the usual and the extreme values with applications to observed and simulated precipitation in South America*, ORNL/TM-2006/542, **Oak Ridge National Laboratory**.

Non Peer-Reviewed Conference Papers / Abstracts (*Current or former direct advisee or mentee)

88. Kodra, E.A.* , Steinhaeuser, K.* , and A.R. Ganguly (2010): *The possibility of persisting cold spells in a warming environment*, **2010 Fall Meeting of the American Geophysical Union**, SFO, CA, December.
89. Ganguly, A.R., Steinhaeuser, K.* , Kao, S.-C.* , and E. Kodra* (2010): *Evaluating projected changes in mean processes, extreme events, and their spatio-temporal dependence structures*, **2010 Fall Meeting of the American Geophysical Union**, SFO, CA, December.
90. Steinhaeuser, K.* , Chawla, N.V., and A.R. Ganguly (2010): *Complex networks reveal persistent global / regional structure and predictive information content in climate data*, **2010 Fall Meeting of the American Geophysical Union**, SFO, CA, December.
91. Ganguly, A.R., Steinbach. M., and V. Kumar (2009): *Knowledge discovery and nonlinear modeling can complement climate model simulations for predictive insights about climate extremes and their impacts*, **2009 Fall Meeting of the American Geophysical Union**, SFO, CA, December. (Invited).
92. Ngnepieba, P.* , and A.R. Ganguly (2009): *Towards rigorous mathematical approaches for forecast generation and uncertainty characterization using multi-model ensembles of climate*, **90th American Meteorological Society Annual Meeting**, Atlanta, GA, January 2010.
93. Kodra, E.A.* , S. Chatterjee, and A.R. Ganguly (2009): *Classic Granger causality may not be appropriate for diagnosing CO₂-temperature and other noisy relationships*. 20th Conference on Probability and Statistics in the Atmospheric Sciences: **90th American Meteorological Society Annual Meeting**, Atlanta, GA, January 2010.
94. Parish, E.S.* , and A.R. Ganguly (2009): *Estimating fresh water availability at regional and decadal scales based on projected changes in climate and population*, 18th Conference on Applied Climatology: **90th American Meteorological Society Annual Meeting**, Atlanta, GA, January 2010.
95. Kao, S.-C.* , and A.R. Ganguly (2009): *Intensification of droughts in a warming environment*, **2009 Fall Meeting of the American Geophysical Union**, San Francisco, CA, December.
96. Parish, E.S.* , and A.R. Ganguly (2009): *Risk formulations versus comprehensive uncertainty characterizations for climate extremes and their impacts*, **2009 Fall Meeting of the American Geophysical Union**, San Francisco, CA, December.
97. Steinhaeuser, K.* , A.R. Ganguly, and N.V. Chawla (2009): *Complex networks as a tool of choice for improving the science of climate extremes and reducing uncertainty in their projections*, **2009 Fall Meeting of the American Geophysical Union**, San Francisco, CA, December.
98. Ganguly, A.R., Parish, E.S.* , Singh, N., Steinhaeuser, K.* , Erickson, D.J., Branstetter, M.L., Wayne, A.W., and E.J. Middleton (2008): *Regional and decadal analysis of climate change induced extreme hydro-meteorological stresses informs adaptation and mitigation policies*. 21st Conference on Climate Variability and Change, **89th Annual Meeting of the American Meteorological Society**, Phoenix, AZ, 11-15 January, 2009.
99. Ganguly, A.R., Branstetter, M.L., Steihaeuser, K.* , Erickson, D., Parish, E.S.* and N. Singh (2008): *Global warming impacts on regional hydrology and water resources*, **Eos Trans. AGU**, 89(53), Fall Meet. Suppl., Abstract H21E-0870.

100. Lai, E.*, Steinhäuser, K.* and A.R. Ganguly (2008): *Trends in mean and extreme rainfall in South Florida and their correlations with sea surface temperature anomalies*, **Eos Trans. AGU**, 89(53), Fall Meet. Suppl., Abstract H13D-0950.
101. Erickson, D., A. Ganguly, K. Steinhäuser*, M. Branstetter, R. Oglesby, F. Hoffman and L. Buja (2008): *Extreme climate event trends: The data mining and evaluation of the AIFI scenario for 2000-2100*, **Eos Trans. AGU**, 89(53), Fall Meet. Suppl., Abstract H12B-03 INVITED.
102. Ganguly, A.R. (2008): *Hydro-meteorological extreme events caused by climate variability or change and their impacts on infrastructures*, Jt. Assembly of the **American Geophysical Union**, Fort Lauderdale, FL, May.
103. Erickson, D.J., Branstetter, M.L., Wilbanks, T.J., Ganguly, A.R., Hoffman, F.M., King, A.W., Buja, L., and T.S. Panwar (2008): *Global climate simulations with the AIFI scenario for 2000-2100: Meltwater, temperature and river flow impacts in India*, Jt. Assembly of the **American Geophysical Union**, Fort Lauderdale, FL, May.
104. Fernandez, S., Li, H.* and A.R. Ganguly (2008): *Racial Segregation, Economic Growth, and Resilience to Natural Disasters*, Joint Assembly of the **American Geophysical Union**, Fort Lauderdale, FL, May.
105. Vatsavai, R.R., Ganguly, A.R., Omitaomu, O.A.*, and B. Bhaduri (2008): *Geospatial-Temporal Data Mining for Infrastructures or Ecosystems under Stress From Severe Weather Events*, Joint Assembly of the **American Geophysical Union**, Fort Lauderdale, FL, May.
106. Parish, E.S.*, Ganguly, A.R., Brunson, A., Shi, B., and E. Roadinger* (2008): *Engaging High School Students in Climate Change Research: A Case Study*, Joint Assembly of the **American Geophysical Union**, Fort Lauderdale, FL, May.
107. Ganguly, A.R., Khan, S.*, Kuhn, G.*, Fang, Y.*, Erickson III, D.J., Branstetter, M., and G. Ostrouchov (2008): *Climate change, rainfall extremes, and population at risk*. **American Meteorological Society**, 88th Annual Meeting, January, 2008, New Orleans, LA.
108. Ganguly, A.R., Parish, E.S.*, and B.L. Bhaduri (2008): *Toward an integrative computational modeling and analysis framework for climate extremes and their impacts*, **American Association of Geographers**, 2008 Annual Meeting, Boston, MA.
109. Ganguly, A.R. (2007): *Multivariate dependence estimation in geophysics*. Fall Meeting of the **American Geophysical Union**, December 2007, San Francisco, CA.
110. Ganguly, A.R., and B.L. Bhaduri (2006): *A framework for geospatial-temporal knowledge discovery*, **American Association of Geographers**, Annual Meeting, San Francisco, CA.
111. Kuhn, G.*, Khan, S.*, and A. Ganguly (2006): *New approaches for extreme value analysis in large-scale geospatial-temporal data with applications to observed and climate-model simulated precipitation in South America*, Session on Role of Observed Precipitation in Atmospheric and Land Surface Models I, Fall Meeting of the **American Geophysical Union**, San Francisco, CA.

112. Fuller, C. *, Sabesan, A. *, Khan, S. *, Kuhn, G. *, Ganguly, A., Erickson, D., and G. Ostrouchov (2006): *Quantification and visualization of the human impacts of anticipated precipitation extremes in South America*, Session on Catastrophic Risk from Natural Perils: Scientific, Engineering, and Financial Issues, Fall Meeting of the **American Geophysical Union**, San Francisco, CA.

Selected for 2006 American Geophysical Union Fall Meeting Press Conference

113. Branstetter, M.L., Erickson, D.J., Ghan, S., Ganguly, A., and Khan, S. * (2006): *Hydrology in the IPCC Simulations*, **CCSM3 (Community Climate System Model, Version 3) Workshop**, Breckenridge, CO.
114. Ganguly, A.R. and Y. Fang* (2006): *Online alarm generation in sensor-cyber networks*, Session on Sensor-Cyber Networks for Homeland Defense, **9th ONR/GTRI Workshop on Target Tracking in Sensor Fusion**, Analytical Predictions of Tracking Performance, Office of Naval Research and Georgia Tech Research Institute, Gatlinburg, TN.
115. Huang, C., Hsing, T., Cressie, N., Ganguly, A.R., Protopopescu, V.A., and N.S. Rao (2006): *Plume Model Identification Based on Statistical Analysis of Sensor Network Data*, Session on Sensor-Cyber Networks for Homeland Defense, **9th ONR/GTRI Workshop on Target Tracking in Sensor Fusion**, Analytical Predictions of Tracking Performance, Office of Naval Research and Georgia Tech Research Institute, Gatlinburg, TN.
116. Ganguly, A.R. (2006): *Basic research needs in SensorNet[®]*, Invited Presentation, **First Conference on Statistical and Quantitative Methods for Defense and National Security**, RAND Corporation and the American Statistical Association, Santa Monica, CA.
117. Abercrombie, K. *, Sabesan, A. *, A.R. Ganguly (2006): *Metrics for the comparative analysis of geospatial datasets with applications to high-resolution grid-based population data*, **American Association of Geographers**, Annual Meeting, Chicago, IL.
118. Ganguly, A.R., Khan, S. *, Erickson, D.J., Katz, R.W., Ostrouchov, G., Protopopescu, V.A., Bandyopadhyay, S., and S. Saigal (2005): *Multivariate dependence in complex systems*, **Fifth Symposium on Understanding Complex Systems**, Univ. of Illinois at Urbana-Champaign, May.
119. Khan, S. *, Bandyopadhyay, S., Ganguly, A.R. (2005): *Nonlinear dependence among multiple time series from limited observations and noise*, Session on Nonlinear Data Sciences for Finite Data with Noise & Periodicity, Fall Meeting of the **American Geophysical Union**, San Francisco, CA.
120. Ganguly, A.R., Khan, S. *, Saigal, S. (2005): *Impact of noise and seasonality on the detection and nonlinear prediction of chaos from finite river-flow time series*, Session on Nonlinear Data Sciences for Finite Data with Noise and Periodicity, Fall Meeting of the **American Geophysical Union**, San Francisco, CA.
121. Samatova, N., Branstetter, M., Ganguly, A.R., Hettich, R., Khan, S. *, Kora, G., Li, J., Ma, X., Pan, C., Shoshani, A., and S. Yoginath (2006): *High performance statistical computing with parallel R: Applications to biology and climate*, **US DOE SciDAC PI Meeting**.
122. Khan, S. *, Ganguly, A.R., and S. Saigal (2004): *Complexity analysis and predictive models for hydrologic systems*, Invited Presentation at the Annual Meeting of the Institute for Operations Research and the Management Sciences (**INFORMS**), Denver, CO.

123. Ganguly, A.R., Khan, S. *, and S. Saigal (2004): *Weather economics: The business of uncertainty*, Invited Presentation at the Annual Meeting of the Institute for Operations Research and the Management Sciences (**INFORMS**), Denver, CO.
124. Ganguly, A.R., and M. Aronowich (2003): *Advanced analytics for closed-loop enterprise planning and forecasting*. **INFORMS** Annual Meeting, Atlanta, Georgia.
125. Ganguly, A.R. (2002): *Forecasting systems and frameworks in disparate complex domains*, **International Conference on Complex Systems**, Nashua, NH.
126. Ganguly, A.R. and Bras, R.L. (2002): *Quantitative precipitation forecasting using radar and numerical weather model outputs*, **American Geophysical Union** Spring Meeting, Wash, DC.
127. Ganguly, A.R. and R.L. Bras (2002): *Artificial neural networks and ensemble methods for forecasting mean rainfall intensities and confidence bounds in space and time*, **American Geophysical Union** Spring Meeting, Washington, DC.
128. Ganguly, A.R. and A. Gupta (1998): *Inventory optimization using statistical and artificial neural network based data mining*, **MIT Industry Liaison Research Directors' Conference**, May 6-7.
129. Ganguly, A.R., Garrotte, L. and Bras, R.L. (1997). *Application of a physically based distributed hydrologic model to large basins*, Proceedings of the Joint Session of the 13th International Conference on Hydrology and the 13th International Conference on IIPS, **American Meteorological Society**, page J55-J58.

Non Peer-Reviewed Book Chapters (*Current or former direct advisee or mentee)

130. Gupta, A.; Seshasai, S.; Mukherji, S.; Ganguly, A. (2008): *Offshoring: The Transition From Economic Drivers Toward Strategic Global Partnership and 24-Hour Knowledge Factory*. In Amar Gupta (editor), **Outsourcing and Offshoring of Professional Services**, Executive Highlight, Chapter 1, pp. 1:24.
131. Ganguly, A.R., Gupta, A., and S. Khan* (2007): *Data mining and decision support for business and science*, **Intelligent Information Technologies: Concepts, Methodologies, Tools and Applications**, V. Sugumaran (editor), Idea Group Inc. (IGI), Chapter 6.1, pp. 1798-1805.

Non Peer-Reviewed Professional Papers (*Current or former direct advisee or mentee)

132. Ganguly, A.R. (2003). *Promotion Effectiveness – Analytical White Paper*, **Demantra Inc.**
133. Ganguly, A. (2003). *Shape Models for Product Profiles & Promotion Planning*, **Demantra Inc.**
134. Ganguly, A. (2002). *Oracle Demand Planning – Executive White Paper*, **Oracle Corporation.**

Synergistic Activities

1. Journal Editorial Boards, Guest Editors and Panels
 - Associate Editor, **Journal of Computing in Civil Engineering**, ASCE
 - Guest Editor with (with J. Gama, O. Omitaomu, M. Gaber, R. R. Vatsavai) of journal **Intelligent Data Analysis**, Special Issue: Knowledge Discovery from Data Streams
 - Reviewer for the IPCC AR5 Special Report on Extremes (SREX)
 - Invited for **United Nations review panel** on environmental impacts of climate change
 - Member of invited reader panel for the journal *Nature*
 - Invited to NSF review panels and DOE strategic workshops

2. Science Lead from ORNL for major climate science efforts
 - **Climate Change War Game:**
 - Reported in Nature, Environmental Science & Tech. and ABC News (Earth 2100)
 - Website: <http://www.ornl.gov/knowledgediscovery/WarGaming>
 - **Climate Support for the Quadrennial Defense Review** to the US DOD
 - Presented to the Office of the Secretary of Defense and user groups at the Pentagon
 - Website: <http://www.ornl.gov/knowledgediscovery/QDR>

3. Workshop or Session Organization
 - *Session Organizer and Chair* (with Mukesh Kumar) **Modeling and Analytics for Hydrologic Impacts Assessment due to Climate Change**, XIX International Conference on **Computational Methods in Water Resources**, Urbana, IL, 2012.
 - *Session Chair and Organizer* (with Michael Wehner), **Characterization, Prediction and Attribution of Weather and Hydrological Extremes with Changing Climate**, Fall Meeting of the **American Geophysical Union (AGU)**, San Francisco, CA, December 2010.
 - *Session Chair and Organizer* (with Dean Williams, Charles Doutriaux and Habib Najm), **Predictive Modeling and Uncertainty Quantification for Systematic Evaluation of Climate Models and Data-Guided Enhancements of Regional Climate Projections**, Fall Meeting of the **American Geophysical Union (AGU)**, San Francisco, CA, December 2010.
 - *Session Chair and Organizer* (with Glenn Tootle, Thomas Piechota and John Drake), **Assessing Uncertainty in Coupled Global Circulation - Hydrologic Models**, Fall Meeting of the **American Geophysical Union (AGU)**, San Francisco, CA, December 2010.
 - Organizer (with Nitesh Chawla, Vipin Kumar, Mike Steinbach and Karsten Steinhaeuser) of workshop entitled **Knowledge Discovery from Climate Data** in the IEEE International Conference on Data Mining, December, 2009
 - Primary Founding Organizer (with co-organizers Joao Gama, Olufemi Omitaomu, Ranga Raju Vatsavai and Mohemaed Gaber) of the Workshop on **Knowledge Discovery from Sensor Data** in three ACM SIGKDD Conferences: KDD 2007, 2008, 2009
 - Convener, (with Jingfeng Wang), **Impacts of Severe Weather on Environment, Economy and Society**, 2008 Joint Assembly of the American Geophysical Union, May
 - Advisory Committee, NSF-sponsored **Next Generation Data Mining**, Baltimore, MD, 2009
 - *Session Chair and Organizer*, **Nonlinear Data Sciences for Finite Data with Noise and Periodicity**, Fall Meeting of the **American Geophysical Union (AGU)**, San Francisco, CA, December 2005.
 - *Session Chair and Organizer*, **Data Mining for the Earth Sciences**, Annual Meeting of the **Institute for Operations Research and the Management Sciences (INFORMS)**, Denver, CA, 2004.

4. Invited Speaker

- Grand Challenges Workshop at International Conference on Machine Learning, 2011
- Civil and Environmental Engineering, **Northeastern University**, Boston, MA, 2011
- **NSF-Sponsored Workshop on Computational Sustainability**, MIT, 2010
- Conference entitled *Exploring the Dimensions of Environmental Carrying Capacity* organized by the Steinbrenner Institute at **Carnegie Mellon University**, Pittsburgh, 2009
- EWRI of the **American Society of Civil Engineers** sponsored conference on water resources, Chennai, India, 2010: Two invited presentations
- **American Geophysical Union**, Fall Meeting, 2009, San Francisco, CA, Nonlinear Geophysics Session
- **Environmental Protection Agency**, Raleigh-Durham, NC, 2009
- **NSF-Sponsored Workshop on Next-Generation Data Mining**, UMBC, Baltimore, 2009
- **NSF-Sponsored Workshop on Uncertainty Quantification**, USC, LA, 2009
- **NOAA-Sponsored Symposium on Air Quality and Climate**, JSU, Jackson, MS, 2009
- Civil and Environmental Engineering, **Carnegie Mellon University**, 2009
- **University of Alabama Huntsville**, and **NASA**, Huntsville, AL, 2009
- **US-Japan (11th Specialist) Joint Climate Conference**, ORNL, 2009
- **Office of the Secretary of Defense at the Pentagon**, US DoD, Washington, DC, 2008
- **Fall Creek Falls Conference**, ORNL/DOE, 2008
- Department of Civil and Environmental Eng., **University of Tennessee, Knoxville**, 2008
- Department of Statistics, **University of Tennessee, Knoxville**, 2008
- **NASA Conference on Intelligent Data Understanding** (Poster), Washington, DC, 2008
- Department of Computer Science and Engineering, **University of Notre Dame**, IN, 2008
- Civil & Environmental Engineering, **Carnegie Mellon University**, Pittsburgh, PA, 2008
- **Defense Advanced Research Projects Agency** (DARPA), US DoD, 2007-2008
- **Fall Creek Falls Conference**, ORNL/DOE, 2007
- Civil and Environmental Engineering, **University of Texas at Austin**, 2007
- **US JFCOM**, United States Department of Defense, 2006
- **American Geophysical Union**, Press Conference on Hydro-Climate Risks Paper, 2006
- **US ARMY**, United States Department of Defense, 2005
- United States **Department of Homeland Security**, 2005
- **Intelligence Community Consortium** (ARDA, currently DTO), 2005
- **Procter and Gamble**, Global Analytics Group (via teleconference), 2004
- Quantitative Methods, **Indian Institute of Management**, Ahmedabad, India, 2002

5. Invited Attendee

- **Climate Decision Support Workshop**, Aspen Global Change Institute, Aspen, CO, 2009
- **Workshop on Modeling Uncertainty in Integrated Assessment Models**, U. Chicago & Argonne Nat'l Lab, Chicago, IL, August, 2008.
- **Identifying Outstanding Grand Challenges in Climate Change Research: Guiding the Department of Energy Strategic Planning**, US DOE, Crystal City, VA, March 25-27, 2008.
- **Weather Extremes Impacts on Infrastructure**, NCAR/LANL Workshop, Sante Fe, New Mexico, February 27-28, 2007.
- **Data Science Technology for Homeland Security Information Management and Knowledge Discovery**, Report of the DHS Workshop on Data Sciences, **Department of Homeland Security**, September 22-23, 2004.

6. Research and Mentorship Recognition

- > 130 total publications/presentations; **~80 peer-reviewed publications**
- Reviewer for **IPCC Fifth Assessment Report (AR5) Special Report on EXTremes (SREX)**
- Two **outstanding mentor awards** from ORNL and US DOE: 2008; 2006
- Three **significant event awards** at ORNL: (1) Novel analysis of climate model simulations, (2) DARPA funded project (contributed to new methods for evaluation of complex models) and (3) climate change war game: 2010; 2009; 2008
- Two **best student / runner-up paper awards** and **one best doctoral poster** by students
- Research abstract selected for **press conference at 2006 Fall AGU Meeting**
- Mentioned among **“top 25 hottest articles”** in Advances in Water Resources
- Invited to **NSF panels** and **DOE climate and integrated assessment related workshops**
- **Three invention disclosures** at ORNL (being processed for patent review)
- Coverage of research in local, national and international media as well as science venues
- Certificate of Appreciation, Research Alliance in Mathematics and Science (Undergraduate Minorities Program), ORNL: 2006; 2009

7. Peer Reviews

- *Panelist and reviewer, 2009 NSF Cross-Cutting CISE Program* (Exact Name Withheld)
- *Panelist and reviewer, 2008 NSF Engineering Research and Innovation Conference*, Division of Civil, Mechanical and Manufacturing Innovation (CMMI).
- *Member of Search Committee, Governor’s Chair in Statistics*, UT-ORNL JICS, 2007.
- *Member, Proposal Evaluation Committee, Dartmouth College* (Institute for Security Technology Studies: ISTS): Two consecutive years (2007-2008).
- *Thesis Examiner*, School of Information Tech., **The University of Sydney**, Australia, 2008
- *Ad hoc peer reviewer*: Multiple journals and peer-reviewed conferences in climate, hydrology, statistics, data mining, nonlinear dynamics, management information systems, risk analysis and decision sciences

8. Invention Disclosures (in various stages of patent application process)

- **Ganguly, A. R.** and S. Khan. (Nonlinear Correlation)
- **Ganguly, A. R.** and G. Kuhn. (Geospatial-Temporal Extremes)
- **Ganguly, A. R.** and O. A. Omitaomu. (Anomaly Analysis for Security)

9. Teaching

- Graduate Courses (Independent Instructor)
 - Knowledge discovery from time series, spatial and spatio-temporal data (3 credits), University of Tennessee, Knoxville, TN (Spring 2007)
 - Applied time series and spatial statistics (3 credits), University of South Florida, Tampa, FL (Fall 2004)
 - Hydrologic models (3 credits), University of South Florida, Tampa, FL (Spring 2004)
- Undergraduate Courses (Teaching Assistant)
 - Structures, University of Windsor, ON, Canada (Fall 1993)
 - Transportation, University of Toledo, OH (Spring 1994)
 - Surveying, University of Toledo, OH (Fall 1994)
- Undergraduate Civil Engineering Tutor
 - University of Toledo, OH (1994-1995)

10. Mentoring and Advising

- **Ph.D. Students** (*University of Tennessee*)
 - *Ph.D. Supervisor*, **Evan Kodra**, Energy Sciences and Engineering (continuing)
- **Ph.D. Students** (*University of Notre Dame*)
 - *Ph.D. Co-Supervisor* (Supervisor: Nitesh V. Chawla), **Karsten Steinhaeuser**, Computer Science
- **Ph.D. Students** (*University of South Florida, FL*)
 - *Major Ph.D. Supervisor* (Co-Supervisor: Sunil Saigal), **Shiraj Khan**, CEE (Hydrologic Systems)
 - *Dissertation successfully defended: June 2007 (currently employed at AIR: Applied Insurance Research)*
 - *Dissertation: Nonlinear Dynamics and Extremes in Hydrology and Climate*
 - *Ph.D. Committee Member* (Adviser: M. Gunaratne), **Duminda Randeniya**, CEE (Transportation Systems)
 - *Dissertation successfully defended: June 2007 (currently employed at ORNL)*
 - *Dissertation: Automatic Geo-Referencing in Vehicles by Integrating Vision and IMU*
- **Visiting Faculty**
 - *Visiting Professor (Mathematics)*, Pierre Ngnepieba, **Florida State University** (Summer 2009 and Summer 2010)
 - *Visiting Professor (Hydrology)*, Subimal Ghosh, **Indian Institute of Technology (IIT) Bombay**, Mumbai, India (Summer 2010)
- **Post-Doctoral Associates** (*Direct Mentor*)
 - *Post-doc in Hydrology (CEE)*, Dr. Shih-Chieh Kao, **ORNL**
 - *Post-doc in Data Mining (Industrial)*, Dr. Olufemi Omitaomu, **ORNL** (absorbed as ORNL staff)
 - *Post-doc / Post-master (Statistics)*, Dr. Gabriel Kuhn, **Oak Ridge National Laboratory** (currently in the private sector)
- **Post-Master Students** (*Direct Mentor*)
 - *Post-master (Computer Science)*, Karsten Steinhaeuser, **ORNL**
 - *Post-master (Geography)*, Esther S Parish, **ORNL** (absorbed as ORNL staff)
 - *Post-master (Computer Science)*, Debasish Das, **ORNL**
 - *Post-doc / Post-master (Statistics)*, Dr. Gabriel Kuhn, **ORNL** (now in private sector)
 - *Post-master (Hydrologic Systems)*, Shiraj Khan, **ORNL** (now at AIR Worldwide)
 - *Post-master (Data Mining)*, Yi Fang, **Oak Ridge National Laboratory** (currently a PhD student at Purdue in Computer Science)
 - *Post-master (Hydrology: CEE)*, Gautam Bisht, **MIT and ORNL**
 - *Post-master (Hydrology: CEE)*, Ryan Knox, **MIT and ORNL**
 - *Post-master (Social Science)*, Huiping Li, **Oak Ridge Center for Advanced Studies**
 - *Post-master (Computer Science & Psychology)*, David Andrew Gerdes, **ORNL**
- **Post-Graduate Student** (*Direct Mentor*)
 - *Post-UG (Statistics)*, Evan Kodra, **ORNL**

- ***Undergraduate Students (Direct Mentor)***
 - *Summer Intern (Statistics)*, Joshua Tolen, **Oak Ridge National Laboratory**
 - *Summer Intern (Statistics)*, Evan Kodra, **Oak Ridge National Laboratory**
 - *Summer Intern (Computer Science)*, Christopher Fuller, **ORNL**
 - *Summer Intern (Industrial)*, Kathleen Abercrombie, **ORNL**
- ***High-School Students (Direct Mentor)***
 - *Summer Intern*, Ethan Lai, **Oak Ridge National Laboratory**
 - *Summer Intern*, Elizabeth Roadinger, **Oak Ridge National Laboratory**
- ***Student Collaborators***
 - *Post-master*, Aarthy Sabesan, **Oak Ridge National Laboratory**
 - *PhD Candidate*, Sharba Bandyopadhyay, **Biomedical Engineering, Johns Hopkins**
 - *Post-master*, Veeraraghavan Vijayaraj, **Oak Ridge National Laboratory**
 - *Post-master*, Nagendra Singh, **Oak Ridge National Laboratory**
 - *Post-master*, Neal Feierabend, **Oak Ridge National Laboratory**

Affiliations

- **Current**
 - American Geophysical Union
 - American Meteorological Society
 - Sigma Xi
 - Institute of Electrical and Electronics Engineers
 - American Society of Civil Engineers
- **Previous**
 - American Computing Machinery
 - Institute for Operations Research and the Management Sciences
 - American Statistical Association

(Selected) Research Funding

Principal Investigator

1. National Science Foundation: Awarded \$900K over 5 years (Just Awarded) as UTK PI with a total award of \$10M over 5 years for an NSF CISE “Expeditions in Computing” project

FY 11 – FY 16

Understanding climate change: A data-driven approach

Team: Minnesota (Overall lead), NCA&T, NCSU and UT-ORNL

2. Nuclear Regulatory Commission: To be Awarded (FY11 – TBD)

Identify and assess databases and methodologies that are suitable for probabilistic modeling of rainfall and other meteorological inputs that are needed for hydrologic simulation approaches to flood risk assessment for nuclear power plants

Team: Single PI driven (initial phase)

3. ORNL Laboratory Directors R&D Funds: Awarded \$819K over 2 years (FY09 – FY10)

Uncertainty assessment and reduction in climate extremes and climate change impacts

Team: ORNL staff from three divisions, students

4. Department of Homeland Security (DHS): Awarded \$500K + \$300K for ~6 months (FY08)

Emergency Preparedness and Risk Analysis

Role: Science Lead (Joint: One of two PIs) and Contributor

Team: ORNL GIST Group / CSE Division

5. ORNL Laboratory Directors R&D Funds: Awarded \$790K over 2 years (FY06 – FY07)

Knowledge discovery from weigh station sensors for transportation and logistics security

Team: ORNL staff from two divisions, students, post-doc, university collaborators

6. ORNL LDRD SEED Money funds: Awarded \$125K for 1 year (FY06)

Multivariate dependence in climate extremes

Team: ORNL staff from two divisions, students, post-doc, university/FFRDC collaborators

Science Lead

7. Department of Defense (DOD): Awarded \$200K for ~1 year

Climate Science Support for Quadrennial Defense Review

Role: Science Lead and Contributor; Team: ORNL (Multiple Divisions)

8. Department of Homeland Security (DHS): Awarded \$500K + \$300K for ~6 months

Emergency Preparedness and Risk Analysis

Role: Science Lead (Joint: One of two PIs); Team: ORNL GIST Group / CSE Division

Co-Principal Investigator

9. Defense Advanced Research Projects Agency (DARPA): Awarded \$750K over ~6 months (FY07)

ACSES: Actionable Capability for Social and Economic Systems (Seedling Project: IPTO)

Team: ORNL, UNC Charlotte, Georgia Tech, ORCAS, Intepoint Inc.

10. ORNL Laboratory Director's R&D Funds: (FY10– FY11): Awarded \$350K for 1 year
Climate impacts on the energy sector
ORNL Staff

11. ORNL Laboratory Director's R&D Funds: (FY10): Awarded \$500K for 5 months
Climate change downscaling and uncertainty
ORNL Staff

Senior Person

12. US DOE Office of Science: Awarded (Support for 1.8 months per year over 5 years)
Developing a regional integrated assessment model framework
Role: Senior Person (Overall Lead: PNNL for \$10M over 5 years)
Team: PNNL (Lead institute) and ORNL

Contributor to Proposals

13. National Geospatial Intelligence Agency: Awarded \$1.8M over 2 years (FY07 – FY08)
Uncertainty in Geospatial Data; Team: ORNL

14. US DOE Scientific Discovery thro' Advanced Computing (SciDAC): \$540K/year over 5 yrs
Software infrastructures for biology & climate

Investigator and Task Lead (the amounts are allocation to the tasks led; not total project funding)

15. ORNL Laboratory Director's R&D Funds: (FY11): ~\$50K
Real Time Outage Detection in Power Grids
ORNL Staff

16. US DOE Office of Science [Biological and Environmental Research] (FY11): \$100K
Data Mining for Carbon Sequestration in Terrestrial Ecosystems
ORNL Staff and Multiple Universities / Labs

17. ORNL Laboratory Director's R&D Funds: (FY07– FY09): ~\$50K
Possible Impacts of Relatively Severe Climate Change
ORNL Staff

18. Office of Naval Research: ORNL SensorNet[®] Program: (FY06 – FY07): \$100K
Spatio-temporal statistics for analysis of data from sensor networks
Led collaboration with Ohio State statistics for one year

19. ORNL LandScan[™] Population Modeling: (FY05 – FY06): ~\$100K
Comparison of grid-based population models and uncertainty in population data

Highlights of Industry (Private Sector) Experience

Summary

- A. Demantra Inc., a best-of-breed demand forecasting software vendor, with R&D offices in Israel and headquarters near Boston, MA, was acquired by Oracle Corporation. Role as Senior Product Manager for Analytics and Strategy comprised leading the analytical efforts in building, validating, and adjusting statistical or optimization algorithms, and, preparing documentation on analytics. Responsibilities included researching and implementing best practices in statistical forecasting and optimization, and planning the roadmap for analytics for demand, promotions and inventory.
- B. Oracle Corporation is the world's largest software and database vendor. Contributed as a time series software developer to the core database kernel. The group currently develops Oracle Spatial. Role as Product Manager for Demand Planning in the R&D organization included managing the development of the product roadmap and the core statistical and functional features, as well as interactions with external customers or prospects and organizations like R&D, sales, marketing, and consulting.

Professional Industry Experience

Demantra Inc., Waltham, MA, 04/2003–11/2003

Senior Product Manager, Analytics & Strategy (2003)

- Led the development of methodologies (automated forecasting, optimization and data mining as well as user-driven analysis) and strategy (algorithm development, competitive analysis, marketing, pre-sales and implementation) for the analytics capabilities across Demantra's product suite, specifically Demand Planning (best of breed) and Promotion Analytics (new/emerging product suite)
- Contributed to algorithm development, management of analytic teams (Israel and USA) working on innovative methodologies and software implementations or UI and sales cycles for large prospects and clients including one of the largest coffee and donut franchises, one of the largest producers of grape juice and one of the biggest fast food chains
- Worked with a team on quantifying impacts of weather fluctuations on demand forecasts and delineating the marginal impacts of promotions on sales and the overall manufacturer and retailer ROI, based on the combination of a variant of the statistical hierarchical Bayesian shrinkage approach with leading marketing theories on product cannibalizations and influence groups: This work led to the award of a large project with a market-leading international coffee and donut retailer, and contributed to an ongoing project with a market-leading bottled grape and other fruit juice vendor
- Evangelized Demantra's products to prospects, customers and researchers via web conferences, scientific conferences and papers

Oracle Corporation, Waltham, MA, 06/1998 – 03/2003

Product Manager, Demand Planning (1999 – 2003)

- Managed Oracle's Demand Planning product from scratch to market launch and adoption
- Coordinated R&D efforts from within the product development group, including the forecasting algorithm development of the demand forecasting engine developed by Roadmap Technologies
- Optimized use of Geneva statistical engine for client specific requirements
- Developed the functional requirements and/or algorithms and methods for the following: Statistical time series forecasting; Multi-dimensional propagation of forecasts and uncertainties; Forecast accuracy metrics and analyses reports; Collaborative business planning and forecast reconciliation; Data transformation and forecast generation rules

- Research of forecasting and planning enhancement areas: Novel statistical engines (e.g., AutoBox); Enabling the Sales and Operations Planning (S&OP) process across enterprises; Intra-enterprise collaboration for one-number forecasts ; Analytics of events (Promotions, new product introductions and obsolescence); Statistical algorithms for causal forecasts; Compatibility with industry standards like CPFR and Rosetta Net
- Product implementation and business process consulting;; Fortune 500 to mid-sized clients in USA, Canada, Europe, and the Asia Pacific; Consulted on collaborative demand planning process, Sales and Operations planning; Optimized use of Geneva statistical engine & OLAP (Express) allocation and aggregation; Consulted on the combined use of a statistical engines and worksheet driven analysis; Advised on and modeled Demand Planning business processes
- Taught courses on demand planning to Oracle's worldwide consulting, sales, and support organizations, and presented to external partners, customers and prospects, published business white papers, technical overviews and detailed functional papers and papers, attended IBF (Institute of Business Forecasting) conferences
- Participated in sales and pre-sales cycles, converted prospects to customers, and beta customers to long-term clients
- Coordinated links with Oracle's OLAP, supply chain, marketing and data mining product suites
- Developed competitive reports, gap analysis white papers, business requirement documents, high-level design documents and contributed to software development
- Presented at Oracle's user meetings and provided support to Oracle's consulting, pre-sales and marketing organizations
- Presented and helped in the positioning and implementation of Oracle's products at multiple US and international prospect and customer sites, from high tech giants to Internet startups

Time Series Software Developer (1998 – 1999)

- Developed and researched time series and forecasting functionality for Oracle database kernel
- Researched on advanced statistical methods for financial forecasting
- Designed functional specifications for time series statistical functions
- Conducted market research for statistical and time series applications in the database