KARSTEN STEINHAEUSER

CURRICULUM VITAE

University of Minnesota
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Education

Ph.D. in Computer Science & Engineering, University of Notre Dame, 2011 (GPA: 4.0)
Dissertation: *Viewing the World Through a Network Lens*
Advisor: Prof. Nitesh Chawla Co-Advisor: Dr. Auroop Ganguly
M.S. in Computer Science & Engineering, University of Notre Dame, 2007 (GPA: 4.0)
Thesis: *Scalable Learning with Thread-Level Parallelism*
Advisor: Prof. Nitesh Chawla
B.S. in Computer Science, *Summa Cum Laude*, University of Notre Dame, 2005 (GPA: 3.94)

Research Interests

Data mining and machine learning, specifically the construction and analysis of graphs/networks; large-scale data analysis, including parallel and distributed algorithms; applications to climate and earth sciences, ecology, biology, sustainability, medicine/healthcare, and social networks.

Professional Experience

2014 - present	Consultant/Software Engineer, RadiantPoint Technologies
2012 - present	Data Scientist/Software Engineer, Progeny Systems Corp., Biometric Systems
2011 - present	Research Associate, University of Minnesota Department of Computer Science and Engineering
2008 - 2011	Research Associate, Oak Ridge National Laboratory GIST Group, Computational Sciences and Engineering Division
2005 - 2011	Graduate Research Assistant, University of Notre Dame Department of Computer Science and Engineering Interdisciplinary Center for Network Science and Applications
2004	Summer Intern, IBM Corp., EDA Business Operations
2003	Summer Intern, Thomson Inc., Research & Development Tools

Awards & Recognition

2012 Selected as NSF/NASA DISCCRS VII Symposium Scholar
2012 NSF EarthCube Early Career Travel Grant for June'12 Charrette
2011 Article on "Persisting Cold Extremes Under 21st-Century Warming Scenarios" featured as Research Highlight in *Nature* and *Nature Climate Change*
2010 ORNL Significant Event Award for "Novel Analyses of the Simulation Results from the CCSM 3.0 Climate Model"

2010 NSF Student Travel Grant for the International Conference on Computational Sustainability
2010 CRC Award for Computational Sciences and Visualization
2010 Runner-Up Poster Award at the Notre Dame Graduate Research Symposium
2009 Best Student Paper Award at the ACM SIGKDD International Workshop on Knowledge Discovery from Sensor Data
2009 Best Poster at the SIAM Data Mining Doctoral Student Forum
2009 NSF Student Travel Grant for the SIAM Conference on Data Mining
2009 ORNL Significant Event Award for "Science Support for a Climate Change War Game and Follow-Up Support to the U.S. Department of Defense"
2009 NSF Student-Author Travel Grant for the Workshop on Social Computing, Behavioral Modeling and Prediction
2008 USMA Student Travel Grant for the International Conference on Network Science
2007 Best Poster Award at the Second Annual CSE Student Research Symposium
2006 Kaneb Center Outstanding Graduate Teaching Assistant
2006 Best Poster Award at the First Annual CSE Student Research Symposium
2005 Rev. A. Leonard Collins, CSC Award for Leadership Excellence
2005 Dean's Honor List all eight undergraduate semesters

Publications

Book Chapters

C. Monteleoni, G.A. Schmidt, F. Alexander, A. Niculescu-Mizil, K. Steinhaeuser, M. Tippett, A. Banerjee, M.B. Blumenthal, A.R. Ganguly, J.E. Smerdon, M. Tedesco. *Climate Informatics*, in T. Yu, N. Chawla, S. Simoff (Eds.), Computational Intelligent Data Analysis for Sustainable Development, CRC Press, 81-126, April 2013.

K. Steinhaeuser, N.V. Chawla. A Network-Based Approach to Understanding and Predicting Diseases. *Social Computing and Behavioral Modeling*, H. Liu, J.J. Salerno, M.J. Young (Eds.), Springer, 209-216, March 2009.

K. Steinhaeuser, N.V. Chawla. Community Detection in a Large Real-World Social Network. *Social Computing, Behavioral Modeling and Prediction*, H. Liu, J.J. Salerno, M.J. Young (Eds.), Springer, 168-175, March 2008.

Refereed Journal Articles

S. Liess, A. Kumar, P.K. Snyder, J. Kawale, K. Steinhaeuser, F.H. Semazzi, A.R. Ganguly, N.F. Samatova, and V. Kumar. Different modes of variability over the Tasman Sea: Implications for Regional Climate. *J. Climate*, 27(22), 8466-8486, November 2014. doi:10.1175/JCLI-D-13-00713.1.

A.R. Ganguly, E. Kodra, A. Banerjee, S. Boriah, S. Chatterjee, S. Chaterjee, A. Choudhary, D. Das, J. Faghmous, P. Ganguli, S. Ghosh, K. Hayhoe, C. Hays, W. Hendrix, Q. Fu, J. Kawale, D. Kumar, V. Kumar, S. Liess, R. Mawalagedara, V. Mithal, R. Oglesby, K. Salvi, P.K. Snyder, K. Steinhaeuser, D. Wang, and D. Wuebbles. Toward enhanced understanding and prediction of climate extremes using physics-guided data mining techniques. *Nonlinear Processes in Geophysics*, 21, 777-795, June 2014. doi:10.5194/npg-21-777-2014.

K. Steinhaeuser, A.A. Tsonis. A climate model intercomparison at the dynamics level. *Climate Dynamics*, 42, 1665-1670, March 2014. doi:10.1007/s00382-013-1761-5.

K. Steinhaeuser, A.R. Ganguly, N.V. Chawla. Multivariate and Multiscale Dependence in the Global Climate System Revealed Through Complex Networks. *Climate Dynamics*, 39, 889-895, August 2012. doi: 10.1007/s00382-011-1135-9.

E. Parish, E. Kodra, K. Steinhaeuser, A.R. Ganguly. Estimating Future Global per capita Water Availability based on Changes in Climate and Population. *Computers and Geosciences*, 42, 79-86, May 2012.

K. Steinhaeuser, N.V. Chawla, A.R. Ganguly. Complex Networks as a Unified Framework for Descriptive Analysis and Predictive Modeling in Climate Science. *Statistical Analysis and Data Mining – Special Issue: Networks*, 5(4), 497-511, October 2011.

E. Kodra, K. Steinhaeuser, A.R. Ganguly. Persisting Cold Extremes Under 21st-Century Warming Scenarios. *Geophysical Research Letters*, 38, L08705, April 2011.

K. Steinhaeuser, N.V. Chawla, A.R. Ganguly. An Exploration of Climate Data Using Complex Networks. *ACM SIGKDD Explorations*, 12(1), 25-32, July 2010.

K. Steinhaeuser, N.V. Chawla. Identifying and Evaluating Community Structure in Complex Networks. *Pattern Recognition Letters*, 31(5), 413-421, April 2010.

A.R. Ganguly, K. Steinhaeuser, D.J. Erickson, M. Branstetter, E. Parish, N. Singh, J.B. Drake, L. Buja. Higher trends but larger uncertainty and geographic variability in 21st century temperature and heat waves. *Proceedings of the National Academy of Sciences USA*, 106(37), 15555-15559, September 2009.

Refereed Conference and Workshop Publications

J. Xu, T.L. Wickramarathne, E. Grey, K. Steinhaeuser, R.P. Keller, J.M. Drake, D.M. Lodge, N.V. Chawla. Improving Management of Aquatic Invasions by Integrating Shipping Network, Ecological, and Environmental Data: Data Mining for Social Good. *ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*, New York, NY, August 2014.

V. Mithal, A. Khandelwal, S. Boriah, K. Steinhaeuser, V. Kumar. Change Detection from Temporal Sequences of Class Labels: Application to Land Cover Change Mapping. *SIAM International Conference on Data Mining (SDM)*, Austin, TX, May 2013.

X. Chen, K. Steinhaeuser, S. Boriah, S. Chatterjee, V. Kumar. Contextual Time Series Change Detection. *SIAM International Conference on Data Mining (SDM)*, Austin, TX, May 2013.

I. Brugere, K. Steinhaeuser, S. Boriah, V. Kumar. Approximate Search of Massive Spatiotemporal Datasets. *IEEE ICDM Workshop on Spatial and Spatio-Temporal Data Mining*, Brussels, Belgium, December 2012.

A. Karpatne, M. Blank, M. Lau, S. Boriah, K. Steinhaeuser, M. Steinbach, V. Kumar. Importance of Vegetation Type in Forest Cover Estimation. *Conference on Intelligent Data Understanding*, Boulder, CO, October 2012.

V. Mithal, Z. O'Connor, K. Steinhaeuser, S. Bortiah, V. Kumar, C. Potter, S. Klooster. Time Series Change Detection using Segmentation: A Case Study for Land Cover Monitoring. *Conference on Intelligent Data Understanding*, Boulder, CO, October 2012.

X. Chen, A. Karpatne, Y. Chamber, V. Mithal, M. Lau, K. Steinhaeuser, S. Boriah, M. Steinbach, V. Kumar, C. Potter, S. Klooster, T. Abraham, J.D. Stanley. A New Data Mining Framework for Forest Fire Mapping. *Conference on Intelligent Data Understanding*, Boulder, CO, October 2012.

J. Kawale, S. Chatterjee, D. Ormsby, K. Steinhaeuser, S. Liess, V. Kumar. Testing the Significance of Spatio-temporal Teleconnection Patterns. *ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*, Beijing, China, August 2012.

S. Chatterjee*, K. Steinhaeuser, A. Banerjee, S. Chatterjee, A.R. Ganguly. Sparse Group Lasso: Consistency and Climate Applications. *SIAM International Conference on Data Mining (SDM)*, Anaheim, CA, April 2012. *Best Student Paper

K. Steinhaeuser, N.V. Chawla, A.R. Ganguly. Comparing Predictive Power in Climate Data: Clustering Matters. *International Symposium on Spatial and Temporal Databases*, Minneapolis, MN, August 2011.

A. Pelan, K. Steinhaeuser, N.V. Chawla, D.A. de Alwis Pitts, A.R. Ganguly. 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, April 2011.

K. Steinhaeuser, N.V. Chawla, A.R. Ganguly. Complex Networks in Climate Science: Progress, Opportunities and Challenges. *NASA Conference on Intelligent Data Understanding (CIDU)*, Mountain View, CA, October 2010.

S.-C. Kao, A.R. Ganguly, K. Steinhaeuser. Motivating Complex Dependence Structures in Data Mining: A Case Study with Anomaly Detection in Climate. *IEEE ICDM Workshop on Knowledge Discovery from Climate Data*, Miami, FL, December 2009.

K. Steinhaeuser, N.V. Chawla, A.R. Ganguly. An Exploration of Climate Data Using Complex Networks. *ACM SIGKDD International Workshop on Knowledge Discovery from Sensor Data (SensorKDD)*, Paris, France, June 2009.

K. Steinhaeuser, N.V. Chawla, A.R. Ganguly. Discovery of Climate Patterns with Complex Networks. *International Conference on Network Science (NetSci)*, Venice, Italy, June 2009.

C. Moretti†, K. Steinhaeuser†, D. Thain, N.V. Chawla. Scaling Up Classifiers to Cloud Computers. *IEEE International Conference on Data Mining (ICDM)*, Pisa, Italy, December 2008. †Equal contribution

A.R. Ganguly, K. Steinhaeuser. Data Mining for Climate Change and Impacts. IEEE ICDM *Workshop on Spatial and Spatio-Temporal Data Mining (SSTDM)*, Pisa, Italy, December 2008.

K. Steinhaeuser, N.V. Chawla. Is Modularity the Answer to Evaluating Community Structure in Networks? *International Conference on Network Science (NetSci)*, Norwich, UK, June 2008.

K. Steinhaeuser, N.V. Chawla. Scalable Learning with Thread-Level Parallelism. *Midwest Artificial Intelligence and Cognitive Science Conference (MAICS)*, Cincinnati, OH, April 2008.

K. Steinhaeuser, N.V. Chawla, P.M. Kogge. Exploiting Thread-Level Parallelism to Build Decision Trees. *ECML/PKDD Workshop on Parallel Data Mining*, Berlin, Germany, September 2006.

K. Steinhaeuser, N.V. Chawla, C. Poellabauer. Towards Learning-Based Sensor Management. *ACM SIGMETRICS Workshop on Tackling Computer Systems Problems with Machine Learning Techniques (SYSML)*, Saint-Malo, France, June 2006.

Extended Abstracts and Presentations (Non-Refereed)

X. Chen, K. Steinhaeuser, S. Boriah, V. Kumar, S. Chatterjee, A. Mueen, V. Narayanan. Contextual Time Series Change Detection Remote Sensing Data. *Third International Workshop on Climate Informatics*, Boulder, CO, September 2013.

A.A. Tsonis, K. Steinhaeuser. A climate model intercomparison at the dynamics level. *Fifth International Conference on Climate: Impacts and Responses*, Port Louis, Mauritius, July 2013.

A.A. Tsonis, K. Steinhaeuser. A climate model intercomparison at the dynamics level. *Invited, 12th International Meeting on Statistical Climatology*, Jeju, Korea, June 2013.

K. Steinhaeuser, A.A. Tsonis. Climate Model intercomparison at the dynamics level. *SIAM Conference on Applications of Dynamical Systems*, Snowbird, UT, May 2013.

A.A. Tsonis, K. Steinhaeuser. A climate model intercomparison at the dynamics level. *European Geosciences Union (EGU) General Assembly*, Vienna, Austria, April 2013.

J. Kawale, S. Liess, A. Kumar, D. Orsmby, K. Steinhaeuser, M. Steinbach, A.R. Ganguly, S. Chatterjee, N. Samatova, F. Semazzi, V. Kumar. Graph Based Analysis of Dynamic Teleconnections. *Fall Meeting of the American Geophysical Union (AGU)*, San Francisco, CA, December 2012.

A. Kumar, S. Liess, J. Kawale, K. Steinhaeuser, D. Ormsby, V. Kumar, S. Chatterjee. A New Teleconnection: The Australian Southern Oscillation. *Fall Meeting of the American Geophysical Union (AGU)*, San Francisco, CA, December 2012.

A. Karpatne, M. Blank, J. Middleton, S. Boriah, K. Steinhaeuser, M. Steinbach, S. Chatterjee, V. Kumar. Understanding the influence of oceanic drivers on natural disturbance events. *Fall Meeting of the American Geophysical Union (AGU)*, San Francisco, CA, December 2012.

V. Mithal, Z. O'Connor, K. Steinhaeuser, S. Boriah, V. Kumar, C. Potter, S. Klooster. Land Cover Change Detection from MODIS Vegetation Time Series Data. *Fall Meeting of the American Geophysical Union (AGU)*, San Francisco, CA, December 2012.

X. Chen, K. Steinhaeuser, S. Boriah, S. Chatterjee, V. Kumar. Contextual Time Series Change Detection for Earth Science Data. *Fall Meeting of the American Geophysical Union (AGU)*, San Francisco, CA, December 2012.

K. Steinhaeuser, J. Faghmous, S. Boriah, S. Liess, F. Vikebo, M. dos Santos Mesquita, V. Kumar. Spatio-Temporal Data Mining for Scalable Ocean Eddie Monitoring. *Fall Meeting of the American Geophysical Union (AGU)*, San Francisco, CA, December 2012.

A.R. Ganguly, E. Kodra, R. Oglesby, L. Buja, D. Das, A. Agrawal, A. Banerjee, S. Boriah, Sn. Chatterjee, So. Chatterjee, A. Choudhary, S. Ghosh, K. Hayhoe, C. Hays, W. Hendrix, Q. Fu, Y. Lu, J. Kawale, D. Kumar, V. Kumar, W.-k Liao, S. Liess, R. Mawalagedara, V. Mithal, H. Najm, K. Salvi, P.K. Snyder, K. Steinhaeuser, D. Wuebbles. Exploiting Big Data to Understand Climate Extremes and Assess their Impacts. *Conference on Intelligent Data Understanding*, Boulder, CO, October 2012.

S. Chatterjee, K. Steinhaeuser, A. Banerjee, S. Chatterjee, A.R. Ganguly. Sparse Group Lasso: Consistency and Climate Applications. *Joint Statistical Meetings (JSM)*, San Diego, CA, July 2012.

K. Steinhaeuser. Knowledge Discovery from Climate Data using Graph-Based Methods. *European Geosciences Union (EGU) General Assembly*, Vienna, Austria, April 2012.

E. Parish, E. Kodra, K. Steinhaeuser, A.R. Ganguly. Projecting Continental U.S. Water Stress Based on Global Datasets. *American Water Resources Association (AWRA) Spring Specialty Conference on GIS and Water Resources*, New Orleans, LA, March 2012.

J. Tolen, E. Kodra, K. Steinhaeuser, A.R. Ganguly. Comparative Evaluation of the IPCC AR5 CMIP5 Versus the AR4 CMIP3 Model Ensembles for Regional Precipitation and their Extremes. *Fall Meeting of the American Geophysical Union (AGU)*, San Francisco, CA, December 2011.

S.D. Wullschleger, J.M. Tolen, K. Steinhaeuser, E. Kodra, R.L. Graham, C.T. Garten Jr., C.G. Brandt, A.R. Ganguly. Data mining and visualization reveal networks among components of a large soil carbon dataset. *Annual Meeting of the Soil Science Society of America (SSSA)*, San Antonio, TX, October 2011.

K. Steinhaeuser, N.V. Chawla, A.R. Ganguly. Complex Networks Reveal Persistent Global / Regional Structure and Predictive Information Content in Climate Data. *Fall Meeting of the American Geophysical Union (AGU)*, San Francisco, CA, December 2010.

E. Kodra, K. Steinhaeuser, A.R. Ganguly. The possibility of persisting cold spells in a warming environment. *Fall Meeting of the American Geophysical Union (AGU)*, San Francisco, CA, December 2010.

A.R. Ganguly, K. Steinhaeuser, E. Kodra, S.-C. Kao. Evaluating Projected Changes in Mean Processes, Extreme Events, and their Spatio-Temporal Dependence Structures. *Fall Meeting of the American Geophysical Union (AGU)*, San Francisco, CA, December 2010.

D.J. Erickson, S.J. Fernandez, O. Omitaomu, M.L. Branstetter, G. Butler, A.R. Ganguly, R. Oglesby, K. Steinhaeuser, E. Kodra, S. Gray. Climate Impacts on US Energy Infrastructure: A New High Resolution Model, Policy Implications and Feedbacks. *Fall Meeting of the American Geophysical Union (AGU)*, San Francisco, CA, December 2010.

D. Das, E. Kodra, K. Steinhaeuser, S.-C. Kao, A.R. Ganguly, M.L. Branstetter, D.J. Erickson, R. Flanery, M.M. Gonzales, C. Hays, A.W. King, C.W. Lenhardt, R. Oglesby, R.M. Patton, C. Rowe, A. Sorokine, C. Steed. Uncertainty and extremes analysis to evaluate dynamical downscaling of climate models. *Fall Meeting of the American Geophysical Union (AGU)*, San Francisco, CA, December 2010.

R. Thompson, K. Steinhaeuser, D.A. de Alwis Pitts, N.V. Chawla. Detecting Changes in Land Cover from Remotely Sensed Data. *GIS Day*, Notre Dame, IN, November 2010.

K. Steinhaeuser, N.V. Chawla, A.R. Ganguly. Descriptive Analysis and Predictive Modeling for Uncertainty Reduction in Regional Climate Projections. *Argonne National Laboratory Postdoctoral Research Symposium*, Argonne, IL, September 2010.

K. Steinhaeuser, N.V. Chawla, A.R. Ganguly. Descriptive Analysis of the Global Climate System and Predictive Modeling for Uncertainty Reduction in Climate Projections Using Complex Networks. *International Conference on Computational Sustainability* (Presentation and NSF-Sponsored Doctoral Consortium), Cambridge, MA, June 2010.

K. Steinhaeuser, N.V. Chawla, A.R. Ganguly. High-Performance Computing & Visualization for Descriptive Analysis and Predictive Modeling in Climate. *Cyberinfrastructure Days*, Notre Dame, IN, April 2010.

A. Pelan, K. Steinhaeuser, N.V. Chawla. Construction and Clustering of Multivariate Networks: A Case Study in Analyzing the Structure of the Global Climate System. *Cyberinfrastructure Days*, Notre Dame, IN, April 2010.

R. Thompson, K. Steinhaeuser, D.A. de Alwis Pitts, N.V. Chawla. Detecting Changes in Land Cover from Remotely Sensed Data. *Cyberinfrastructure Days*, Notre Dame, IN, April 2010.

K. Steinhaeuser, N.V. Chawla, A.R. Ganguly. Descriptive and Predictive Analysis of Climate Data Using Complex Networks. *Graduate Research Symposium*, Notre Dame, IN, January 2010.

K. Steinhaeuser, A.R. Ganguly. Heat waves and cold spells in a warming climate. *Annual Meeting of the American Meteorological Society (AMS)*, Atlanta, GA, January 2010.

E. Kodra, K. Steinhaeuser, A.R. Ganguly. Classic Granger causality may not be appropriate for diagnosing the CO2-temperature and other noisy relationships. *Annual Meeting of the American Meteorological Society (AMS)*, Atlanta, GA, January 2010.

A.R. Ganguly, K. Steinhaeuser, S.-C. Kao, E. Parish. Climate Extremes: The Science, Impacts and Policy Relevance. *EWRI ASCE Developing Nations Conference*, Chennai, India, January 2010.

A.R. Ganguly, K. Steinhaeuser, S.-C. Kao, E. Parish, M. Branstetter, A. Sorokine, D.J. Erickson, A.W. King. Trends and geographic variability in hydro-meteorological extremes for the 21st century from a climate model. *EWRI ASCE Developing Nations Conference*, Chennai, India, January 2010.

K. Steinhaeuser, A.R. Ganguly, N.V. Chawla. Complex networks as a tool of choice for improving the science of climate extremes and reducing uncertainty in their projections. *Fall Meeting of the American Geophysical Union (AGU)*, San Francisco, CA, December 2009.

A.R. Ganguly, E. Parish, S.-C. Kao, K. Steinhaeuser. Water resources with climate change and growing population. *Exploring the Dimensions of Environmental Carrying Capacity Conference*, Pittsburgh, PA, November 2009.

A.R. Ganguly, K. Steinhaeuser, A. Sorokine, E. Parish, S.-C. Kao, M. Branstetter. Geographic Analysis & Visualization of Climate Extremes for the Quadrennial Defense Review. Demo at the *ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems*, Seattle, WA, November 2009.

A.R. Ganguly, S.-C. Kao, K. Steinhaeuser, E. Parish. Climate Extremes: The Science, Impacts and Policy Relevance. *Fall Creek Falls Conference*, Chattanooga, TN, September 2009.

K. Steinhaeuser, N.V. Chawla, A.R. Ganguly. Descriptive and Predictive Analysis of Climate Data. *SIAM Data Mining Doctoral Student Forum*, Reno, NV, May 2009.

A.R. Ganguly, E. Parish, N. Singh, K. Steinhaeuser, D.J. Erickson, M. Branstetter, A.W. King, E.J. Middleton. Regional and decadal analysis of climate change induced extreme hydro-meteorological stresses informs adaptation and mitigation policies. *Annual Meeting of the American Meteorological Society (AMS)*, Phoenix, AZ, January 2009.

E. Lai, K. Steinhaeuser, A.R. Ganguly. Trends in mean and extreme rainfall in South Florida and their correlations with sea surface temperature anomalies. *Fall Meeting of the American Geophysical Union (AGU)*, San Francisco, CA, December 2008.

A.R. Ganguly, M. Branstetter, K. Steinhaeuser, D.J. Erickson, E. Parish, N. Singh. Global warming impacts on regional hydrology and water resources. *Fall Meeting of the American Geophysical Union (AGU)*, San Francisco, CA, December 2008.

D.J. Erickson, A.R. Ganguly, K. Steinhaeuser, M. Branstetter, R. Ogelsby, F. Hoffman, L. Buja. Extreme climate event trends: The data mining and evaluation of the A1FI scenario for 2000-

2100. Invited, *EOS Transactions of the American Geophysical Union (AGU)*, Fall Meeting Suppl., San Francisco, CA, December 2008.

K. Steinhaeuser, N.V. Chawla, A.R. Ganguly. Data Mining for Insights on Impacts of Global Climate Change. *Graduate Research Symposium*, Notre Dame, IN, November 2008.

K. Steinhaeuser, N.V. Chawla, A.R. Ganguly. GIS in Data Mining for Climate Change and Impacts. *GIS Day*, Notre Dame, IN, November 2008.

K. Steinhaeuser, N.V. Chawla. Using Node Attributes to Improve Community Detection in Networks. *CSE Student Research Symposium*, Notre Dame, IN, November 2007.

K. Steinhaeuser, N.V. Chawla, P.M. Kogge. Exploiting Thread-Level Parallelism to Build Decision Trees. *CSE Student Research Symposium*, Notre Dame, IN, November 2006.

Technical Reports

V. Mithal, A. Khandelwal, S. Boriah, K. Steinhaeuser, V. Kumar. Supplement for "Change Detection from Temporal Sequences of Class Labels: Application to Land Cover Change Mapping." University of Minnesota Technical Report 13-003, Minneapolis, MN, January 2013.

X. Chen, K. Steinhaeuser, S. Boriah, S. Chatterjee, V. Kumar. Supplement for "Contextual Time Series Change Detection." University of Minnesota Technical Report 13-002, Minneapolis, MN, January 2013.

A. Kumar, S. Liess, J. Kawale, D. Ormsby, K. Steinhaeuser, V. Kumar. A New Teleconnection: The Australian Southern Oscillation. University of Minnesota Technical Report 12-020, Minneapolis, MN, September 2012.

X. Chen, K. Steinhaeuser, S. Boriah, S. Chatterjee, V. Kumar. Contextual Time Series Change Detection. University of Minnesota Technical Report 12-018, Minneapolis, MN, July 2012.

A. Karpatne, X. Chen, Y. Chamber, V. Mithal, M. Lau, K. Steinhaeuser, S. Boriah, M. Steinbach, V. Kumar. A Data Mining Framework for Forest Fire Mapping. University of Minnesota Technical Report 12-011, Minneapolis, MN, March 2012.

K. Steinhaeuser, N.V. Chawla, A.R. Ganguly. Complex Networks as a Unified Framework for Descriptive Analysis and Predictive Modeling in Climate. University of Notre Dame Technical Report TR-2010-07, Notre Dame, IN, October 2010.

K. Steinhaeuser, E. Parish, A. Sorokine, A.R. Ganguly. Projected State of the Arctic Sea Ice and Permafrost by 2030. Oak Ridge National Laboratory Technical Report Manual ORNL/TM-2009/265, Oak Ridge, TN, November 2009.

E. Parish, A.R. Ganguly, K. Steinhaeuser. Climate Change in the Dominican Republic. Oak Ridge National Laboratory Technical Report Manual ORNL/TM-2008/168, Oak Ridge, TN, September 2008.

Invited Presentations

Fall Meeting of the American Geophysical Union: Data Mining for Global Change: A Vision for "Big Data" in the Earth Sciences. Session IN029: Large-Scale Data Analytics in Earth System Science. San Francisco, CA, December 2012.

International Conference on Computational Methods in Water Resources: Exploring Data Mining and Machine Learning Methods for Hydrology. University of Illinois at Urbana-Champaign, Urbana, IL, June 2012.

Climate Knowledge Discovery Workshop: Knowledge Discovery with Networks for Climate Science: Questions and Answers from CKD Hamburg. Supercomputing, Seattle, WA, November 2011.

Climate Knowledge Discovery Workshop: Knowledge Discovery with Networks: What Data Mining Can Do for Climate Science. Deutsches Klimarechenzentrum, Hamburg, Germany, March 2011.

GIS Day: Complex Networks in Climate and Ecology (and More!). University of Notre Dame, Notre Dame, IN, November 2009.

Patents

US Patent No. 8958603: Automated Mapping of Land Cover Using Sequences of Aerial Imagery. Issued February 17, 2015.

Service Activities

Organizing Committee

EGU Session on Inferring Models from Data for Qualitative vs. Quantitative Forecasts, 2015-2016
International Workshop on Climate Informatics, Co-Organizer, 2011; Co-Chair, 2012; Steering Committee, 2013-2014
EGU Session on Complex Networks and Data-Driven Knowledge Discovery, Co-Convener, 2013-201
NASA/IEEE Conference on Intelligent Data Understanding, Publicity Chair, 2011-2012
ACM SIGKDD Workshop on Knowledge Discovery from Sensor Data, Co-Organizer, 2011-2012
AGU Session on Advanced Methods for Pattern Recognition and Data Prospecting for Big Data, Co-Convener, 2012
Supercomputing Workshop on Climate Knowledge Discovery, Co-Organizer, 2012
EGU Session on Complex Networks, Co-Convener, 2012
AAAI Discovery Informatics Symposium, Co-Chair, 2012
IEEE ICDM Workshop on Knowledge Discovery from Climate Data, Co-Organizer, 2009-2011
ACM SIGKDD Workshop on Knowledge Discovery from Sensor Data, Challenge Organizer: Change Detection in Climate Data, 2009

Program Committee

SIAM International Conference on Data Mining, 2013-2014
ASE International Conference on Big Data Science and Computing, 2013-2014
ICCS Workshop on Data Mining in Earth Systems Science, 2012-2014
IEEE International Conference on Big Data, 2013
International Conference on Machine Learning, 2012
AAAI Special Track on Computational Sustainability and Artificial Intelligence, 2012
ACM SIGKDD Workshop on Social Network Mining and Analysis, 2012
IEEE International Conference on Granular Computing, 2011-2012
NASA Conference on Intelligent Data Understanding, 2010
ACM Conference on Information and Knowledge Management, 2009, 2012
ACM SIGKDD International Workshop on Knowledge Discovery from Sensor Data, 2009-2010
Midwest Artificial Intelligence and Cognitive Science Conference, 2009

Reviewer

Book Chapters
Advances in Machine Learning and Data Mining for Astronomy, CRC Press

Journals
Nature Communications
Public Library of Science (PLOS) ONE
ACM Data Mining and Knowledge Discovery
IEEE Transactions on Systems, Man and Cybernetics - Part B
IEEE Transactions on Knowledge and Data Engineering
IEEE Geoscience and Remote Sensing Letters
Statistical Analysis and Data Mining
Data & Knowledge Engineering
Journal of Climate
Climate Dynamics
Nonlinear Processes in Geophysics
Geophysical Research Letters
Water Resources Research
Entropy
Information Fusion
Computers & Geosciences
Earth Science Informatics
Computers, Environment, and Urban Systems
The Computer Journal
Information Systems Journal
Journal of Computer Science and Technology

Conferences and Workshops
ACM SIGKDD Conference on Knowledge Discovery and Data Mining
IEEE International Conference on Data Mining
SIAM International Conference on Data Mining
International Conference on Machine Learning
ACM Conference on Information and Knowledge Management
ACM International World Wide Web Conference
NASA/IEEE Conference on Intelligent Data Understanding
International Joint Conference on Neural Networks
IEEE Symposium Series on Computational Intelligence
IEEE World Congress on Computational Intelligence
IEEE International Conference on Granular Computing
International Florida Artificial Intelligence Research Society Conference
Midwest Artificial Intelligence and Cognitive Science Conference
AAAI Special Track on Computational Sustainability and Artificial Intelligence
ACM SIGKDD Workshop on Knowledge Discovery from Sensor Data
IEEE International Workshop on Data Warehousing and KD from Sensors and Streams
ICCS Workshop on Data Mining in Earth System Science
International Workshop on Statistical Pattern Recognition

Professional Community Leadership & Service

NSF Proposal Review Panelist, 2015
NSF Proposal Review Panelist, 2014
DISCCRS Application Review Panelist, 2013
Research Grant Council of Hong Kong Review Panelist, 2013

NSF/NASA DISsertations initiative for the advancement of Climate Change ReSearch (DISCCRS) VII Symposium Scholar, 2012
AFSOR Proposal Reviewer, 2012
NSF Proposal Review Panelist, 2012
NSF EarthCube June'12 Charrette, Participant, 2012
NSF EarthCube Data Mining Community Group, Member and Contributor, 2012
NSF Discovery Informatics Workshop, Participant and Report Co-Author, 2012
IEEE Computational Intelligence Society, Data Mining Technical Committee, Member, 2011-2012
Upsilon Pi Epsilon (ΥΠΕ), Chapter President, 2005-2006
Upsilon Pi Epsilon (ΥΠΕ), Chapter Treasurer, 2004-2005

Professional & Honor Society Membership

Institute of Electrical and Electronics Engineers (IEEE)
American Geophysical Union (AGU)
International Honor Society for the Computing and Information Disciplines (ΥΠΕ)
The Engineering Honor Society (ΤΒΠ)

Institutional Leadership & Service

University of Notre Dame, College of Engineering Dean Search Committee, Member, 2006-2007
University of Notre Dame, College of Engineering College Council, Member, 2005-2007
University of Notre Dame, College of Engineering Dean's Advisory Council, 2003-2005

Local Community Leadership & Service

Notre Dame Club of Minnesota, Communications Director, 2012-present

Research Grants

Pending	National Aeronautics and Space Administration – NRA A.40: *Scalable Analysis of Earth System Data Using Parallelized Graph-Based Approaches*. Consultant (PI: V. Kumar, U. Minnesota – $500K/2 years)
2011 - 2012	University of Minnesota, Institute on the Environment – Mini Grant: *Interdisciplinary Reading Group for Climate Science, Statistics and the Computational Sciences.* Co-PI (PI: S. Chatterjee, U. Minnesota – $2K/1 year)
2011	US Department of Energy, Office of Biological and Environmental Research: *Carbon Sequestration in Terrestrial Ecosystems (CSiTE)*. Synergistic Activity (PI: R.L. Graham, ORNL – DOE BER Research Consortium)
2010 - 2015	National Science Foundation – Expeditions in Computing: *Understanding Climate Change: A Data Driven Approach*. Senior Personnel (PI: V. Kumar, U. Minnesota – $10M/5 years)
2010 - 2011	Planetary Skin Institute: *Global Land Use Change*. Senior Personnel (PI: V. Kumar, U. Minnesota – $2.5M/3 years)
2009 - 2011	Centers for Disease Control and Prevention: *Investigation of Acute Febrile Illness in Uganda*. Synergistic Activity (PI: S. Shadomy, CDC – $225K/2 years)
2008 - 2010	Oak Ridge National Laboratory, Laboratory Directed Research & Development: *Uncertainty Assessment and Reduction for Climate Extremes and Climate Change Impacts*. Co-PI – $235K (PI: A.R. Ganguly, ORNL – $848K/3 years)

Professional Experience Details

2014 - present Consultant / Software Engineer, RadiantPoint Technologies, Honolulu, HI
Responsibilities: Design, development, and implementation of innovative software solutions for various customers with a focus on biomedical and health informatics applications.

2012 - present Data Scientist / Software Engineer, Progeny Systems Corp., Manassas, VA
Responsibilities: Research and software development for data mining and machine learning problems in diverse areas including time series analysis, sparse regression, anomaly detection and prediction, computer vision, biometrics, and data compression. Our technologies are deployed by a wide array of government organizations and commercial enterprises in variety of areas, e.g., computer systems monitoring; object/face detection, recognition, and tracking for security and surveillance; and manufacturing quality control.

2011 - present Research Associate, University of Minnesota, Minneapolis, MN
Department of Computer Science and Engineering
Responsibilities: Conducting research and managing large research projects, directing graduate and undergraduate students and other research staff, writing scholarly papers and preparing research proposals. Research activities include developing data mining techniques for global climate phenomena, algorithms to detect changes in global land cover, and the discovery of relationship between the oceans, atmosphere and terrestrial ecosystems.

2008 - 2011 Research Associate, Oak Ridge National Laboratory, Oak Ridge, TN
GIST Group, Computational Sciences and Engineering Division
Responsibilities: Data mining research with applications in climate science focused on network-based analysis methods; involves the development and application of data mining or statistical methods to observations, reanalysis and/or model-generated climate datasets, high-performance computing for analysis, and creation of high-quality visualizations.

2005 - 2011 Graduate Research Assistant, University of Notre Dame, Notre Dame, IN
Department of Computer Science and Engineering
Interdisciplinary Center for Network Science and Applications
Responsibilities: Research in complex networks and high-performance data mining; requires development (including efficient / scalable implementation) and application of mining methods to address relevant questions in various domains including social networks, medical informatics, and climate science.

2004 Summer Intern, IBM Corp., EDA Business Operations, Hopewell Junction, NY
Responsibilities: Writing of a research grant proposal to the German Federal Government; required familiarization with IC design and fabrication process and direct collaboration with two other international industry leaders.

2003 Summer Intern, Thomson Inc., Research & Development Tools
Responsibilities: Developed software tools for the IC Research & Innovation Team; primary task was the re-design of an editor for VHDL parsing, syntax checking, and formatting conforming to the latest language standard.

Teaching Experience

Summer 2007	CSE30331 Data Structures, Instructor Level: Undergraduate Course Description: Fundamental techniques in the design and analysis of non-numerical algorithms and their data structures including lists, stacks, queues, deques, priority queues, search trees, and graphs; complexity; sorting and searching algorithms, programming and design techniques.
Spring 2007	CSE 40625/60625 Machine Learning, Teaching Assistant Level: Undergraduate and Graduate Instructor: Prof. Nitesh Chawla
Fall 2006	CSE40647/60647 Data Mining, Teaching Assistant Level: Undergraduate and Graduate Instructor: Prof. Nitesh Chawla
Spring 2006	CSE 20212 Fundamentals of Computing II, Teaching Assistant Level: Undergraduate Instructor: Prof. Patrick Flynn
Fall 2005	CSE 20211 Fundamentals of Computing I, Teaching Assistant Level: Undergraduate Instructor: Prof. Aaron Striegel
2002 - 2005	EG10111/10112 Introduction to Engineering, Peer Mentor Level: First-Year Students Instructor: Dr. Leo McWilliams

Mentoring Experience

Nicholas Myers, undergraduate research assistant, University of Wisconsin-Milwaukee, 2013
Saurabh Agrawal, PhD student, University of Minnesota, 2012
Nikai Gibson, summer research assistant, University of Minnesota, 2012
James Middleton, summer research assistant, University of Minnesota, 2012
Zachary Pearson, summer research assistant, University of Minnesota, 2012
Rahni Sumler, summer research assistant, University of Minnesota, 2012
Xi Chen, PhD student, University of Minnesota, 2011-2012
Anuj Karpatne, PhD student, University of Minnesota, 2011-2012
Jaya Kawale, PhD student, University of Minnesota, 2011-2012
Ankush Khandelwal, PhD student, University of Minnesota, 2012
Arjun Kumar, PhD student, University of Minnesota, 2011-2012
Varun Mithal, PhD student, University of Minnesota, 2011-2012
Ayush Singhal, PhD student, University of Minnesota, 2011-2012
Ivan Brugere, MS student, University of Minnesota, 2011-2012
Yashu Chamber, MS student, University of Minnesota, 2011-2012
Dominick Ormsby, undergraduate research assistant, University of Minnesota, 2011-2012
Laina Breidenbach, undergraduate research assistant, University of Minnesota, 2011-2012
Roland Welter, undergraduate research assistant, University of Minnesota, 2011-2012
Michael O'Brien, undergraduate research assistant, University of Notre Dame, 2011
Graham Smith, undergraduate research assistant, University of Minnesota, 2011
Lydia Manikonda, visiting research assistant, University of Minnesota, 2011
Atmananda Persaud, undergraduate research assistant, University of Minnesota, 2011
Saurabh Agrawal, summer research assistant, University of Minnesota, 2011
Sumit Raj, summer research assistant, University of Minnesota, 2011
Anthony Joyner, summer research assistant, NOAA Interdisciplinary Scientific Environmental Technology (ISET) Educational Partnership Program, University of Minnesota, 2011
Greg Simpson, summer research assistant, NOAA Interdisciplinary Scientific Environmental Technology (ISET) Educational Partnership Program, University of Minnesota, 2011
Rahni Sumler, summer research assistant, NOAA Interdisciplinary Scientific Environmental Technology (ISET) Educational Partnership Program, University of Minnesota, 2011
Dipanwita Dasgupta, PhD student, University of Notre Dame, 2011
Debasish Das, summer research associate, Oak Ridge National Laboratory and PhD student, Temple University, 2010; summer research assistant, University of Minnesota, 2011
Joshua Tolen, research associate, Oak Ridge National Laboratory and undergraduate student, University of Tennessee - Knoxville, 2010-2011
Evan Kodra, research associate, Oak Ridge National Laboratory and PhD student, University of Tennessee - Knoxville, 2009-2011
Alex Pelan, undergraduate research assistant, University of Notre Dame, 2010-2011
Robert Thompson, undergraduate research assistant, University of Notre Dame, 2010
Jonathan Rann, summer research associate, Research Alliance in Math and Science – HBCU, Oak Ridge National Laboratory, 2009
Ethan Lai, summer research associate, Oak Ridge National Laboratory, 2008

References

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