

Chad A. Steed

Data Science and Visualization Group
Cyber Resilience and Intelligence Division
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STRENGTHS & SKILLS

Data Visualization, Data Science, Databases, Machine Learning, and Data Analysis Expertise • Strategic and Technical Leadership • Basic & Applied Research • Education • Stakeholder Engagement • Executive Leadership Collaborations • Multidisciplinary Collaborations • Communicating Complex Topics to Diverse Audiences • Technical and Creative Writing • Fine Art and Digital Photography • JavaScript, Java, Python, HTML/CSS, SQL, C/C++ Software Development • D3.js • Observable

EDUCATION

Ph.D. in Computer Science: Mississippi State University, Starkville, MS *Dec. 2008*

Dissertation: “Development of a Geovisual Analytics Environment using Parallel Coordinates with Applications to Tropical Cyclone Analysis”

Advisor: J. Edward Swan II, Committee: T.J. Jankun-Kelly, P. J. Fitzpatrick, R. Moorhead, E. Allen

M.S. in Hydrographic Science: University of Southern Mississippi, Hattiesburg, MS *Aug. 2004*

Project: “A Hydrographic Survey of the Pearl River from Stennis Space Center to the I-10 Bridge”

IHO Category “A” Certified Hydrographer

Advisor: David Dodd

B.S. in Software Engineering: University of Southern Mississippi, Hattiesburg, MS *May 1999*

Minor: Fine Art

Senior Project Title: “A Cartographic Viewer for the World Vector Shoreline Plus Database”

Advisor: Desmond Fletcher

Graduated with Honors

PROFESSIONAL POSITIONS

Distinguished Research Staff & Group Leader *2022-Present*

Oak Ridge National Laboratory, Oak Ridge, TN

- Lead the Data Science and Visualization Group with a focus on national security science R&D
- Internationally recognized expert in the data visualization, data science, and visual analytics fields
- Strategic leadership and people management experience in government, industry, and academia
- Univ. of Tennessee and Univ. of Texas at El Paso advisory panel service
- MIT Applied Data Science Program participant

Senior Director of Data Analytics & Distinguished Research Fellow *2021-2022*

Lirio LLC, Knoxville, TN.

- Led team of data scientists to enhance Lirio’s behavioral science + AI platform for health providers
- Established new cloud-based analytics platform to democratize internal/external performance analysis using ObservableHQ, D3.js, Snowflake, and Microsoft products
- Engaged in business development, nominated as a cultural ambassador, and led data literacy efforts
- Completed Belmont University Executive Leadership program

Vice President & Data Visualization Function Manager 2021
Regions Financial Corp., Birmingham, AL

- Worked closely with Head of Data Visualization to form strategic vision and expand capabilities
- Introduced web-based visual analytics application development to enhance BI products
- Taught data visualization literacy and helped hire and mentor team of data visualization specialists
- Direct interaction with C suite executives and upper management to introduce advanced analytics

Senior Research Staff & VISTA Laboratory Director 2010-2021
Oak Ridge National Laboratory, Oak Ridge, TN

- Founding director of the Visual Informatics for Science and Technology Advances (VISTA) Lab
- Principal investigator and lead researcher on dozens of projects spanning a myriad of domains
- Team leader, division council service, and numerous mentoring experiences
- International visual analytics scholar and joint faculty appointments at multiple universities

Computer Scientist 2001-2010
U.S. Naval Research Laboratory, Stennis Space Center, MS

- Principal investigator and technical lead for environmental database and data visualization projects
- Hydrographic science expert, select graduate fellowship, and contracting officer certification
- Lead database researcher for U.S. Navy bathymetric, geophysical, and sediment type databases
- Oversaw the development of a new semi-submersible unmanned submarine platform with industry

Software Engineer 1999-2001
Lockheed Martin, Stennis Space Center, MS

- Developed new interactive cartographic viewer for the World Vector Shoreline Plus database
- Designed new database format using HDF5 for the U.S. Navy's Digital Bathymetric database

ACADEMIC APPOINTMENTS

Joint Faculty Appointment, University of Tennessee Bredesen Center, Knoxville, TN	2017-2021
Joint Faculty Appointment, University of Tennessee EECS Dept., Knoxville, TN	2013-2021
Adjunct Professor, Mississippi State University, Starkville, MS	2012-2019
Adjunct Professor, University of Southern Mississippi, Hattiesburg, MS	2009

HONORS & AWARDS

Regions Financial Corp. Data & Analytics Associate of the Month (July)	2021
MSU Bagley College of Engineering Distinguished Fellow	2018
Petal High School Academic Hall of Fame	2017
ORNL Director's Best Research & Development Poster Award	2016
R&D 100 Award Finalist (for CoNNECT energy analytics project)	2015
ORNL Early Career Researcher Award	2014
ORNL Technology Commercialization Award	2014
ORNL Significant Event Award (for ACME project)	2014
Elsevier Computers & Geosciences Journal Best Paper Award for 2013	2014
ORNL Technology Commercialization Award	2013
R&D 100 Award (for DTHSTR recommender algorithm)	2013
ORNL Significant Event Award (for DTHSTR development and licensing)	2013
Upsilon Pi Epsilon Honor Society Induction	2008
NRL Select Graduate	2005-2007
NRL Technology Transfer Award (for GDBV Project)	2005
Lockheed Martin Lightning Award (for DBDBV Project)	1999
"Best of Show" Painting Award in the USM Fine Art Dept. Student Art Show	1999

GRANTS & CONTRACTS

Principle Investigator or Investigator on 47 grants or contracts for a total of \$16.4M

Lead Principal Investigator on 21 grants or contracts totaling \$8.9M

- 2024 Principal Investigator, “Visual Analytics R&D”, DoD, \$200,000
- 2024 Investigator (Visual Analytics Lead), “Alexandria Analytics”, NNSA, \$150,000
- 2024 Investigator (Data Visualization/UI Lead), “Cybernetics”, U.S. Dept. of Veterans Affairs, \$150,000
- 2023-2024 Principal Investigator, “Centralized Interactive Phenomics Resource (CIPHER)”, U.S. Dept. of Veterans Affairs, \$1,128,000
- 2023-2024 Principal Investigator, “Quantum Performance Analysis”, ORNL, \$350,000
- 2023 Principal Investigator, “Visual Analytics Development”, ORNL, \$50,000
- 2023 Investigator, “Multivariate Visual Analytics”, Dept. of Defense, \$90,000
- 2023 Investigator, “Cavendish: Publication Mining”, Dept. of Energy, \$50,000
- 2020 Principal Investigator, “Visual Analytics for Science and Technology (VISTA) Laboratory”, ORNL, \$250,000
- 2020 Investigator, “Virtual Anesthesiology”, Dept. of Defense, \$75,000
- 2019-2020 Investigator, “Nuclear Nonproliferation Data Science”, NNSA, \$250,000
- 2019-2020 Investigator, “Power Grid Security”, DOE, \$250,000
- 2019 Investigator, “Health Information Technology Advanced Analytics”, U.S. Dept. of Veterans Affairs, \$150,000
- 2017-2020 Principal Investigator, “SciDAC RAPIDS: Temporal and Multivariate Visual Analysis”, DOE ASCR, \$300,000
- 2017-2019 Principal Investigator, “Publication Mining”, DOE, \$700,000
- 2017-2018 Principal Investigator, “New Multi-modal Interactive Data Visualization Techniques for Scientific Data Analysis”, ORNL Seed Project, \$190,000
- 2016-2018 Investigator, “Cyber Analytics Techniques and Tools”, DOE, \$400,000
- 2016-2017 Principal Investigator, “Visualization Science Advisor to ORNL’s Spallation Neutron Source”, ORNL SNS, \$80,000
- 2015-2017 Investigator, “Data Analytics for Additive Manufacturing”, ORNL Manufacturing Demonstration Facility (MDF), \$400,000
- 2015-2016 Principal Investigator, “In Situ Visual Analytics for Transformative Extreme Scale Science”, ORNL LDRD, \$645,000
- 2015-2016 Investigator, “Algorithms for Context-specific Analysis of Heterogeneous Unstructured Big Health Data”, ORNL LDRD, \$700,000
- 2014-2016 Principal Investigator, “Visual Analysis of Complex Systems”, Dept. of Defense, \$600,000
- 2013-2014 Principal Investigator, “Interactive Analysis of High Throughput, Unstructured Information Streams”, ORNL LDRD, \$900,000
- 2012 Investigator, “A Scalable Framework for Timely Discovery and Situational Understanding of Cyber Attacks”, ORNL LDRD, \$350,000
- 2011-2012 Investigator, “Citizen Framework for Energy Efficient Communities (CoNECT)”, ORNL LDRD, \$350,000
- 2011-2012 Investigator (Visualization Research Lead), “CMS Knowledge Discovery Infrastructure,” Center for Medicare and Medicaid Services (CMS), \$200,000
- 2011-2012 Principal Investigator, “Multi-State Sharing Initiative,” DHS S&T Southeast Region Research Initiative, \$300,000

- 2011 Investigator (Visualization Task Lead), “Scalable Connections for Diverse Information Stores: Knowledge Efficiencies for Streamlining National Health Informatics,” ORNL LDRD, \$150,000
- 2011-2013 Investigator, “Climate Science for a Sustainable Energy Future,” DOE Office of Science, \$300,000
- 2010-2014 Investigator, “Ultra-scale Visualization Climate Data Analysis Tools,” DOE Office of Science, \$350,000
- 2010-2011 Principal Investigator, “Massively Parallel Algorithms for Scalable Exascale Data Analysis,” ORNL LDRD, \$720,000
- 2010-2011 Investigator, “Multi-State Sharing Initiative,” DHS S&T Southeast Region Research Initiative, \$150,000
- 2010 Investigator, “Scale Dependency in Dynamical Downscaling of Extreme Climate Events Over Complex Topography,” ORNL LDRD, \$200,000
- 2010 Principal Investigator, “Visual Analytics for Undersea Warfare Planning Study,” PEO-C4I & Space PMW-120 Tactical Oceanographic Capabilities / Undersea Warfare, \$40,000
- 2010 Investigator, “Bathymetry/Hydrography Uncertainty Normalization,” PEO-C4I & Space PMW-120 METOC Futures Program, \$180,000
- 2006-2010 Principal Investigator, “Geophysical Data Base Variable Resolution Version 2,” PEO-C4I & Space PMW-120 Ocean Bottom Characterization Initiative, \$540,000
- 2008-2010 Principal Investigator, “Autonomous Underwater Vehicle Bathymetry,” PEO-C4I & Space PMW-120 LBSF&I Program, \$755,000
- 2008-2010 Principal Investigator, “Undersea Semi-Submersible (USS) Vehicle,” PEO-C4I & Space PMW-120 Congressional Plus-up Project, \$200,000
- 2006-2009 Investigator, “OAML Bathymetric Data Fusion,” PEO-C4I & Space METOC Futures Program, \$472,000
- 2008 Investigator, “Metrics to Evaluate the Effectiveness of Distributed AUV Sensors,” NRL Base Program 6.2, \$20,000
- 2007 Investigator, “Autonomous Underwater Vehicle Data Acquisition and Planning,” PEO-C4I & Space PMW-180 LBSF&I, \$100,000
- 2005-2006 Principal Investigator, “Shipping Noise Data Base (SNDB),” PEO-C4I & Space PMW-180, \$211,000
- 2004-2005 Investigator, “AQS-20 Through-The-Sensor Rapid Transition Project,” PEO-C4I & Space PMW-150, \$1,200,000
- 2003-2004 Principal Investigator, “Geophysical Data Base Variable Resolution,” SPAWAR PMW-150, \$345,000
- 2001-2002 Principal Investigator, “Precision Underwater Mapping System (PUMA)–Tactical Environmental Data Server (TEDS) System,” SPAWAR PMW-150, \$340,000

OPEN-SOURCE PROJECTS

In addition to the project listed below, several other open-source and online project examples are available at the following locations:

<https://csteed.com>
<https://observablehq.com/@csteed>
<http://github.com/csteed/>

CrossVis2

Description: A web-based multivariate visual analytics tool based on parallel coordinates

Web Application: <https://ornl.github.io/CrossVis2/>

Source Code: <https://github.com/ORNL/CrossVis2>

SnapshotVis

Description: Interactive visualizations of network paths derived from concepts in PubMed literature

Web Application: <https://ornl.github.io/SnapshotVis/>

Source Code: <https://github.com/ORNL/SnapshotVis>

COVID19Vis

Description: Several interactive visualizations of COVID-19 metrics

Web Application: <https://ornl.github.io/COVID19Vis/>

Source Code: <https://github.com/ORNL/COVID19Vis>

Top500Vis

Description: Web-based visualizations of Top 500 supercomputing list in collaboration with UTK ICL

Web Application: <http://csteed.com/Top500Vis/>

Source Code: <https://github.com/csteed/Top500Vis>

CrossVis

Description: Expanded version of the EDEN visual analytics tool with additional data type support for interactive exploratory data analysis

Source Code: <https://github.com/ORNL/CrossVis>

Falcon

Description: Visual analytics tool for interactive analysis of large multivariate data sets

Source Code: <http://github.com/csteed/falcon>

Exploratory Data analysis ENvironment (EDEN)

Description: A visual analytics tool for interactive analysis of large-scale multivariate data sets

Source Code: <http://github.com/csteed/eden>

StormBrush

Description: A collection of visualization methods for analyzing tropical cyclone information with inspiration from Impressionist art.

Source Code: <http://github.com/csteed/stormbrush>

MultiVar

Description: Investigations of visualization methods for encoding multivariate climate simulation data using visual attributes of glyphs

Web Application: <http://csteed.github.io/multivar>

Source Code: <http://github.com/csteed/multivar>

PUBLICATIONS

97 research publications (12 journal articles, 27 conference papers, 9 referred abstracts, 20 workshop or position papers, 2 book chapters, 26 technical reports, and 1 dissertation) and 3 patents. Most of these publications are available on my personal web site at <https://csteed.com/>.

Journal Articles (12)

- J12. L. Miguel Encarnação, Jörn Kohlhammer, and **Chad A. Steed**. Visualization for AI Explainability. *IEEE Computer Graphics and Applications*, 42:6, Dec. 2022. doi: 10.1109/MCG.2022.3208786
- J11. **Chad A. Steed**, John R. Goodall, Junghoon Chae, and Artem A. Trofimov. CrossVis: A Visual Analytics System for Exploring Heterogeneous Multivariate Data with Applications to Materials and Climate Sciences. *Graphics & Visual Computing*, 3:200013, 2020. doi:10.1016/j.gvc.2020.200013
- J10. Artem A. Trofimov, Alison A. Pawlicki, Nikolay Borodinov, Shovon Mandal, Teresa J. Mathews, Mark Hildebrand, Maxim A. Ziatdinov, Katherine A. Hausladen, Paulina K. Urbanowicz, **Chad A. Steed**, Anton V. Ievlev, Alex Belianinov, Joshua K. Michener, Rama Vasudevan, and Olga S. Ovchinnikova. Deep Data Analytics for Genetic Engineering of Diatoms Linking Genotype to Phenotype via Machine Learning. *Nature Partner Journals Computational Materials*, 5:4, 2019. doi:10.1038/s41524-019-0202-3
- J9. John R. Goodall, Eric D. Ragan, **Chad A. Steed**, Joel W. Reed, G. David Richardson, Kelly M.T. Huffer, Robert A. Bridges, and Jason A. Laska. Situ: Identifying and Explaining Suspicious Behavior

- in Networks. *IEEE Transactions on Visualization and Computer Graphics*, 25(1), 2019. doi:10.1109/TVCG.2018.2865029
- J8. **Chad A. Steed**, William Halsey, Ryan Dehoff, Sean L. Yoder, Vincent Paquit, and Sarah Powers. Falcon: Visual Analysis of Large, Irregularly Sampled, and Multivariate Time Series Data in Additive Manufacturing. *Computers & Graphics*, 63:50–64, 2017. doi:10.1016/j.cag.2017.02.005
- J7. Arvind Ramanathan, Laura L. Pullum, Tanner C. Hobson, Christopher G. Stahl, **Chad A. Steed**, Shannon P. Quinn, Chakra S. Chennubhotla, and Silvia Valkova. Discovering Multi-scale Co-occurrence Patterns of Asthma and Influenza with Oak Ridge Bio-surveillance Toolkit. *Frontiers in Public Health*, 3(2015): 182, Oct. 2015. doi:10.3389/fpubh.2015.00182
- J6. Alex Belianinov, Rama K. Vasudevan, Evgheni Strelcov, **Chad Steed**, Sang Mo Yang, Alexander Tselev, Stephen Jesse, Michael Biegalski, Galen Shipman, Christopher Symons, Albina Borisevich, Richard Archibald, Sergei Kalinin. Big Data and Deep Data in Scanning and Electron Microscopies: Deriving Functionality from Multidimensional Data Sets. *Advanced Structural and Chemical Imaging*, 1(6):1–25, 2015. doi:10.1186/s40679-015-0006-6
- J5. Dali Wang, Yang Xu, Peter Thornton, Anthony King, **Chad A. Steed**, Lianhong Gu, and Joseph Schuchart. A Functional Unit Testing Platform for the Community Land Model. *Environmental Modeling and Software*, 55:25–31, 2014. doi:10.1016/j.envsoft.2014.01.015
- J4. **Chad A. Steed**, Daniel M. Ricciuto, Galen Shipman, Brian Smith, Peter E. Thornton, Dali Wang, and Dean N. Williams. Big Data Visual Analytics for Exploratory Earth System Simulation Analysis. *Computers & Geosciences*, 61:71–82, 2013. doi:10.1016/j.cageo.2013.07.025 **CAGEO 2013 Best Paper Award**
- J3. Dean N. Williams, Timo Bremer, Charles Doutriaux, John Patchett, Sean Williams, Galen Shipman, Ross Miller, David R. Pugmire, Brian Smith, **Chad A. Steed**, E. Wes Bethel, Hank Childs, Harinarayan Krishnan, Prabhat, Claudio T. Silva, Emanuele Santos, David Koop, Tommy Ellqvist, Jorge Poco, Berk Geveci, Aashish Chaudhary, Andy Bauer, Alexander Pletzer, Dave Kindig, Gerald L. Potter, and Thomas P. Maxwell. The Ultrascale Visualization Climate Data Analysis Tools (UV-CDAT): Data Analysis and Visualization for Geoscience Data. *IEEE Computer*. 46(9):68–76, 2013. doi:10.1109/MC.2013.119
- J2. **Chad A. Steed**, Patrick J. Fitzpatrick, T.J. Jankun-Kelly, Amber N. Yancey, and J. Edward Swan II. An Interactive Parallel Coordinates Technique Applied to a Tropical Cyclone Climate Analysis. *Computers & Geosciences*, 35(7):1529–1539, 2009. doi:10.1016/j.cageo.2008.11.004
- J1. **Chad A. Steed**, Patrick J. Fitzpatrick, J. Edward Swan II, and T.J. Jankun-Kelly. Tropical Cyclone Trend Analysis using Enhanced Parallel Coordinates and Statistical Analytics. *Cartography and Geographic Information Science*, 36(3):251–265, 2009. doi:10.1559/152304009788988314

Conference Papers (27)

- C27. **Chad A. Steed**, Junghoon Chae, Samudra Dasgupta, Travis S. Humble. QVis: A Visual Analytics Tool for Exploring Noise and Errors in Quantum Computing Systems. In *Proceedings of IEEE International Conference on Quantum Computing and Engineering*, Bellevue, WA, Sep. 2023.
- C26. Regan Moreno, **Chad A. Steed**, Katherine Engstrom, and Erik Schmidt. Examining and Presenting Cycles in Temperature Logs from the Vulcan Diffractometer. In *Proceedings of the ORNL Smoky Mountains Computational Sciences and Engineering Conference*, pp. 443–450, 2020. doi:10.1007/978-3-030-63393-6_29
- C25. Junghoon Chae, Debsindhu Bhowmik, Heng Ma, Arvind Ramanathan, and **Chad A. Steed**. Visual Analytics for Deep Embeddings of Large Scale Molecular Dynamics Simulations. In *IEEE International Conference on Big Data*, pp. 1759–1764, 2019. doi:10.1109/BigData47090.2019.9006048
- C24. Junghoon Chae, **Chad A. Steed**, John Goodall, and Steven Hahn. Dynamic Color Mapping with a Multi-scale Histogram: A Design Study with Physical Scientists. In *Proceedings of the Visualization and Data Analysis Conference*, pp. 680–1–680-13, Jan. 2019. doi:10.2352/ISSN.2470-1173.2019.1.VDA-680

- C23. Dali Wang, Zhuo Yao, Yulu Xu, **Chad A. Steed**, Scott Atchley, Jamison Daniel, Brian Smith. In Situ Data Infrastructure for Scientific Unit Testing Platform. In *Proceedings of the International Conference on Computational Science*, pp. 587–598, June 2016. doi:10.1016/j.procs.2016.05.344
- C22. Arvind Ramanathan, Shannon Quinn, Laura Pullum, and **Chad A. Steed**. Tracking Alcohol and Marijuana Usage and Behaviors from Social Media using Oak Ridge Bio-Surveillance Toolkit. In *Proceedings of the IEEE International Conference on Biomedical and Health Informatics*, Feb. 2016.
- C21. **Chad A. Steed**, Margaret Drouhard, Justin Beaver, Joshua Pyle, and Paul L. Bogen II. Matisse: A Visual Analytics System for Exploring Emotion Trends in Social Media Text Streams. In *Proceedings of the IEEE International Conference on Big Data (IEEE Big Data 2015)*, pp. 807–814, Oct. 2015. doi:10.1109/BigData.2015.7363826 (62/368 [18%] acceptance rate)
- C20. **Chad A. Steed**, Katherine J. Evans, John F. Harney, Brian C. Jewell, Galen Shipman, Brian E. Smith, Peter E. Thornton, and Dean N. Williams. Web-based Visual Analytics for Extreme Scale Climate Science. In *Proceedings of the IEEE International Conference on Big Data (IEEE Big Data 2014)*, pp. 383–392, Oct. 2014. doi:10.1109/BigData.2014.7004255 (49/264 [18%] acceptance rate)
- C19. Robert Patton, **Chad A. Steed**, Chris G. Stahl, and Jim N. Treadwell. Observing Community Resiliency in Social Media. *The 13th International Conference on Computational Science and Applications (ICCSA 2013)*, pp. 491–501, June 2013. doi:10.1007/978-3-642-39640-3_36
- C18. Brian Smith, Daniel M. Ricciuto, Peter E. Thornton, Galen Shipman, **Chad Steed**, and Dean Williams. ParCAT: Parallel Climate Analysis Toolkit. In *Proceedings of the International Conference on Computational Science*, pp. 2367–2375, June 2013. doi:10.1016/j.procs.2013.05.408
- C17. Arvind Ramanathan, **Chad A. Steed**, Laura L. Pullum. Verification of Compartmental Epidemiological Models using Metamorphic Testing, Model Checking and Visual Analytics. In *Proceedings of the ASE/IEEE International Conference on BioMedical Computing (BioMedCom)*, Washington, D.C., Dec. 2012. doi:10.1109/BioMedCom.2012.18
- C16. Songhua Xu, Brian Jewell, **Chad Steed**, and Jack Schryver. A New Collaborative Tool for Visually Understanding National Health Indicators. In *Proceedings of the International Conference on Applied Human Factors and Ergonomics (AHFE)*, San Francisco, CA, July 2012.
- C15. **Chad A. Steed**, Galen Shipman, Peter Thornton, Daniel Ricciuto, David Erickson, and Marcia Branstetter. Practical Application of Parallel Coordinates for Climate Model Analysis. In *Proceedings of the International Conference on Computational Science*, pp. 877–886, June 2012. doi:10.1016/j.procs.2012.04.094
- C14. **Chad A. Steed**, Christopher Symons, Frank DeNap, and Thomas E. Potok. Guided Text Analysis Using Adaptive Visual Analytics. In *Proceedings of the Visualization and Data Analysis Conference*, SPIE. doi:10.1117/12.904904 (24/50 [48%] acceptance rate)
- C13. Robert M. Patton, Justin M. Beaver, **Chad A. Steed**, Thomas E. Potok, and Jim N. Treadwell. Hierarchical Clustering and Visualization of Aggregate Cyber Data. In *Proceedings of the International Wireless Communications and Mobile Computing Conference*, pp. 1287–1291, IEEE Computer Society. doi:10.1109/IWCMC.2011.5982725 (35% acceptance rate)
- C12. Justin M. Beaver, **Chad A. Steed**, Robert M. Patton, Xiaohui Cui, and Matthew Schultz. Visualization Techniques for Computer Network Defense. In *Proceedings of the Defense & Security Symposium*, vol. 8019, pp. 1–9, SPIE. doi:10.1117/12.883487
- C11. **Chad A. Steed**, J. Edward Swan II, T.J. Jankun-Kelly, and Patrick J. Fitzpatrick. Guided Analysis of Hurricane Trends using Statistical Processes Integrated with Interactive Parallel Coordinates. In *Proceedings of Symposium on Visual Analytics Science and Technology* (J. Stasko and Jarke J. van Wijk, eds.), Atlantic City, NJ, pp. 19–26, IEEE Computer Society, Oct. 2009 (26/ 69 [38%] acceptance rate; Proceedings cover page featured a figure from this paper). doi:10.1109/VAST.2009.5332586
- C10. Art Kleiner, David Alleman, Pete Alleman, and **Chad A. Steed**. Development of a New Unmanned Semi Submersible (USS) Vehicle. In *Proceedings of Oceans 2009*, pp. 1–6, MTS/IEEE, Oct. 2009.
- C9. **Chad A. Steed**, T.J. Jankun-Kelly, and J. Edward Swan II. Illustrative Visualization of Hurricane Advisory Information. In *Proceedings of Oceans 2009*, Biloxi, MS, pp. 1–9, MTS/IEEE, Oct. 2009.

- C8. Costin Barbu, William E. Avera, Dale Bibee, Michael M. Harris, and **Chad Steed**. AQS-20 Sonar Processing Enhancement for Bathymetry Estimation. In *Proceedings of Oceans 2005*, Washington, D.C., vol. 3, pp. 2025–2029, MTS/IEEE, Sep. 2005. doi:10.1109/OCEANS.2005.1640057
- C7. Michael Harris, William Avera, **Chad Steed**, John Sample, L. Dale Bibee, Dave Morgerson, Jim Hammack, and Mark Null. AQS-20 Through-The-Sensor (TTS) Performance Assessment. In *Proceedings of Oceans 2005*, Washington, D.C., vol. 1, pp. 460–465, MTS/IEEE, Sep. 2005. doi:10.1109/OCEANS.2005.1639807
- C6. **Chad A. Steed**, John Sample, Michael Harris, William Avera, and L. Dale Bibee. AQS-20 Through-The-Sensor Environmental Data Sharing. In *Proceedings of the Defense & Security Symposium*, Orlando, FL, vol. 5778, pp. 32–41, SPIE, Mar. 2005. doi:10.1117/12.606327
- C5. Michael Harris, Will Avera, L. Dale Bibee, **Chad Steed**, John Sample, Mark Null, and Jim Hammack. Environmental Data Collection, Sensor to Decision Aid. In *Sixth International Symposium on Technology and the Mine Problem*, Monterey, CA, pp. 818–823, Naval Postgraduate School, May 2004.
- C4. Stephanie Myrick and **Chad Steed**. 3D Enhancements for Visualizing Lane Navigation Performance. In *Proceedings of the Human Performance, Situation Awareness, and Automation Technology Conference*, Daytona Beach, FL, pp. 248–252, Lawrence Erlbaum Association, Mar. 2004.
- C3. **Chad A. Steed**, Chiu-Fu “Tiger” Cheng, and David W. Harvey. Development of a Flexible, Geophysical Database using HDF5. In *Proceedings of Oceans 2009*, Biloxi, MS, pp. 1–6, MTS/IEEE, Oct. 2003.
- C2. **Chad A. Steed**, Kim Koehler, Dave Harvey, and Bruce Northridge. Geophysical Data Base Variable Resolution (GDBV): An Object-Oriented Database for Dynamic Geoacoustic Data Storage. In *Proceedings of Oceans 2003*, San Diego, CA, pp. 132–140, MTS/IEEE, Sep. 2003. doi:10.1109/OCEANS.2003.178534
- C1. **Chad A. Steed**, Kim Koehler, and James E. Braud. VGRID: A Generic, Dynamic HDF5 Storage Model for Georeferenced Grid Data. In *Proceedings of Oceans 2002*, Biloxi, MS, pp. 900–907, MTS/IEEE, Oct. 2002. doi:10.1109/OCEANS.2002.1192087

Referred Abstracts (9)

- A9. **Chad A. Steed**, Junghoon Chae, John Goodall, and Steven Hahn. Improving Scientific Data Analysis Through Multi-touch Enabled Interactive Data Visualization with Applications to Neutron Science. In *Proceedings of the Workshop on Immersive Analytics at IEEE VIS 2017*, Phoenix, AZ, pp. 1–2, Oct. 2017.
- A8. **Chad A. Steed**, Ryan Dehoff, William Halsey, Sean Yoder, Vincent Paquit, and Sarah Powers. Advancing Additive Manufacturing Through Visual Data Science. In *Proceedings of the Symposium on Visualization in Data Science at IEEE VIS 2016*, Baltimore, MD, pp. 1–2, Oct. 2016.
- A7. William Halsey, **Chad A. Steed**, Ryan Dehoff, Vincent Paquit, and Sean Yoder. Segmented Time Series Visualization Tool for Additive Manufacturing. In *IEEE Large Data Analysis and Visualization (LDAV) Symposium Posters Compendium*, Baltimore, MD, pp. 1–2, Oct. 2016.
- A6. Blake Haugen, Brian Smith, **Chad A. Steed**, Daniel Ricciuto, Peter E. Thornton, and Galen Shipman. ParCAT: A Parallel Climate Analysis Toolkit. *AGU 2012 Fall Meeting*, San Francisco, CA, Dec. 2012.
- A5. Christopher Maness, **Chad A. Steed**, and Olufemi Omitaomu. Practical Web Based Visualization for Comparative Energy Usage Analysis. In *IEEE Visualization Conference Compendium*, Seattle, WA, pp. 1–2, IEEE Computer Society.
- A4. David J. Erickson, Auroop R. Ganguly, Robert James Oglesby, Evan A. Kodra, Debasish Das, Anthony W. King, Cindy Hays, **Chad Steed**, Robert Patton, and Chris Lenhardt. Scale Dependency in Dynamic Downscaling of Extreme Climate Events Over Complex Topography. Abstract GC24B-05, *AGU 2011 Fall Meeting*, San Francisco, CA, Dec. 2011.
- A3. Debasish Das, Evan Kodra, Karsten Steinhaeuser, Shih-Chieh Kao, Auroop R. Ganguly, Marcia L. Branstetter, David J. Erickson, Raymond Flanery, Maria Martinez Gonzalez, Cynthia Hays, Anthony

- W. King, Christopher Lenhardt, Robert Oglesby, Robert M. Patton, Clinton M. Rowe, Alexander Sorokine, **Chad Steed**. Scale Dependency in Dynamic Downscaling of Extreme Climate Events Over Complex Topography. *AGU Fall Meeting Poster Session*, San Francisco, CA, Dec. 2010.
- A2. **Chad A. Steed**, T.J. Jankun-Kelly, J. Edward Swan II, and Robert J. Moorhead. Illustrative Visualization of Hurricane Advisory Information. In *IEEE Visualization Conference Compendium*, Atlantic City, NJ, pp. 1—2, IEEE Computer Society, Oct. 2009.
- A1. **Chad A. Steed**, Patrick J. Fitzpatrick, T.J. Jankun-Kelly, Amber N. Yancey, and J. Edward Swan II. Practical Application of Parallel Coordinates to Hurricane Trend Analysis. In *IEEE Information Visualization Conference Compendium*, pp. 4—5, IEEE Computer Society, Oct. 2007.

Workshop or Position Papers (20)

- W20. Junghoon Chae, Shang Gao, Arvind Ramanathan, **Chad A. Steed**, and Georgia D. Tourassi. Visualization for Classification in Deep Neural Networks. In *Proceedings of the Workshop on Visual Analytics for Deep Learning at IEEE VIS 2017*, Phoenix, AZ, Oct. 2017.
- W19. Sarah Powers, Ryan Dehoff, Vincent Paquit, **Chad A. Steed**, and Derek Kistler. Application of Data Analytics to Additive Manufacturing. In *Proceedings of the 11th INFORMS Workshop on Data Mining and Decision Analytics*, Nashville, TN, Nov. 2016.
- W18. **Chad A. Steed**, Jamison Daniel, Margaret Drouhard, Thomas Proffen, and Steven Hahn. Immersive Visual Analytics for Transformative Neutron Scattering Science. In *Proceedings of the 1st Workshop on Immersive Analytics at IEEE Virtual Reality 2016*, Greenville, SC, Mar. 2016. doi:10.1109/IMMERSIVE.2016.7932381
- W17. Shannon Quinn, Arvind Ramanathan, Laura Pullum, and **Chad A. Steed**. Dr. Twitter: The Logistics of Practical Disease Surveillance using Social Media. In *Proceedings of the Web-based Public Health Informatics Workshop at IEEE BHI 2016*, Feb. 2016.
- W16. Blake Haugen, Stephen Richmond, Jakub Kurzak, **Chad A. Steed**, and Jack Dongarra. Visualizing Execution Traces with Task Dependencies. In *Proceedings of the 2nd Workshop on Visual Performance Analysis at SC 15*, Austin, TX, Nov. 2015. doi:10.1145/2835238.2835240
- W15. Margaret Drouhard, **Chad A. Steed**, Steven Hahn, Thomas Proffen, Jamison Daniel, and Michael Matheson. Immersive Visualization for Materials Science Data Analysis using the Oculus Rift. In *Proceedings of the 2nd Workshop on Advances in Software and Hardware for Big Data to Knowledge Discovery at IEEE Big Data 2015*, Santa Clara, CA, pp. 2453–2461, Oct. 2015. doi:10.1109/BigData.2015.7364040
- W14. **Chad A. Steed**, Justin Beaver, Paul L. Bogen II, Margaret Drouhard, and Joshua Pyle. Text Stream Trend Analysis using Multiscale Visual Analytics with Applications to Social Media Systems. In *Proceedings of the ACM IUI Visual Text Analytics Workshop*, Atlanta, GA, Mar. 2015.
- W13. **Chad A. Steed**, Thomas E. Potok, Laura L. Pullum, Arvind Ramanathan, Galen Shipman, and Peter E. Thornton. Extreme Scale Visual Analytics. In *Proceedings of the 4th SuperComputing Workshop on Petascale Data Analytics (SC13)*, Denver, CO, Nov. 2013.
- W12. Arvind Ramanathan, Laura L. Pullum, **Chad A. Steed**, Shannon S. Quinn, and Chakra S. Chennubhotla. Oak Ridge Bio-surveillance Toolkit. In *Proceedings of IEEE VAST Workshop on Public Health's Wicked Problems: Can InfoVis Save Lives?*, Atlanta, GA, Oct. 2013.
- W11. Arvind Ramanathan, Laura L. Pullum, **Chad A. Steed**, Shannon S. Quinn, Chakra S. Chennubhotla, and Tara Parker. Integrating Heterogeneous Healthcare Datasets and Visual Analytics for Disease Bio-surveillance and Dynamics. In *Proceedings of the 3rd Interactive Visual Text Analytics Workshop*, Atlanta, GA, Oct. 2013.
- W10. Dali Wang, Yang Xu, Peter Thornton, Anthony King, and **Chad A. Steed**. A Pilot Study on Functional Unit Testing for Community Land Model. *Computational Data Analytics Workshop (CDAW-13)*, Oak Ridge, TN, Oct. 2013.
- W9. Robert Patton, **Chad A. Steed**, Chris Stahl. Visualizing Community Resilience Metrics from Twitter Data. *The 2nd Workshop on Social Media Visualization (ICWSM-13)*, Boston, MA, Jul. 2013.

- W8. **Chad A. Steed**, Thomas E. Potok, Robert M. Patton, John R. Goodall, Christopher Maness, James Senter. Interactive Visual Analysis of High Throughput Text Streams. In *Proceedings of the 2nd Interactive Visual Text Analytics Workshop*, Seattle, WA, Oct. 2012. <http://research.microsoft.com/en-us/um/people/shliu/tasmc/>
- W7. Olufemi A. Omitaomu, Christopher S. Maness, Ian S. Kramer, Jeffrey B. Kodysh, Budhendra L. Bhaduri, **Chad A. Steed**, Rajasekar Karthik, Philip J. Nugent, Aaron T. Myers. An Integrated Geovisual Analytics Framework for Analysis of Energy Consumption Data and Renewable Energy Potentials. In *Proceedings of the GeoSpatial Visual Analytics Workshop at GIScience*, Columbus, OH, Sep. 2012. [http://geoanalytics.net/GeoVA\(t\)2012/](http://geoanalytics.net/GeoVA(t)2012/)
- W6. **Chad A. Steed**, Patrick J. Fitzpatrick, T.J. Jankun-Kelly, and J. Edward Swan II. North Atlantic Hurricane Trend Analysis using Parallel Coordinates and Statistical Techniques. In *Proceedings of the GeoSpatial Visual Analytics Workshop*, Park City, UT, pp. 1—4, Sep. 2008. <http://geoanalytics.net/GeoVisualAnalytics08/>
- W5. Paul Elmore and **Chad A. Steed**. Algorithm for Bathymetry Fusion with Uncertainty Assessment. In *Proceedings of the NRL Technical Metrics Workshop*, Stennis Space Center, MS, May 2008.
- W4. **Chad A. Steed**. Advanced Visualization Techniques for Undersea Warfare. In *Proceedings of the NRL Technical Metrics Workshop*, Stennis Space Center, MS, May 2008.
- W3. Stephanie Myrick and **Chad Steed**. 3-Dimensional Scene Reconstruction and Animation using VRML/X3D. In *Proceedings of Mississippi Academy of Sciences Annual Meeting*, Biloxi, MS, Mississippi Academy of Sciences, Feb. 2004.
- W2. Kim Koehler, Michael Harris, Dale Bibee, **Chad Steed**, and Dave Bates. Ocean Through The Sensor (TTS) Update. *SPAWAR PMW-150 Quarterly Newsletter*, pp. 1—11, Space and Naval Warfare Command, Dec. 2003.
- W1. **Chad A. Steed** and Hillary Mesick. A Method for Overcoming Discontinuity Between Neighboring UTM Zone Grids. In *Proceedings of Mississippi Academy of Sciences Annual Meeting*, Biloxi, MS, Mississippi Academy of Sciences, Feb. 2002.

Book Chapters (2)

- B2. **Chad A. Steed**. Interactive Data Visualization. In *Data Analytics for Intelligent Transportation*. Eds. Mashrur Chowdhury, Amy Apon, and Kakan Dey. pp. 165–190, 2017.
- B1. **Chad A. Steed**, J. Edward Swan II, Patrick J. Fitzpatrick, and T.J. Jankun-Kelly. A Visual Analytics Approach for Correlation, Classification, and Regression Analysis. In *Innovative Approaches of Data Visualization and Visual Analytics*. Eds. Maolin Huang and Weidong Huang. pp. 25–45, 2013. doi:10.4018/978-1-4666-4309-3.ch002

Technical Reports (26)

- T26. James Garner, Susan Smith, Scott Stewart, Greg Westphal, Erik Schmidt, **Chad Steed**, Natalie McGill, Mark Adams. “SD Card and DCM-C5 Camera Thermal Neutron Testing 2019 Results”. ORNL Technical Report ORNL/TM-2021/1980, Oak Ridge National Laboratory, Oak Ridge, TN, Aug. 2022. 38 pp.
- T25. **Chad A. Steed**, Ryan Dehoff, William Halsey, Sean Yoder, Vincent Paquit, and Sarah Powers. Falcon: A Temporal Visual Analytics System Applied to the Analysis of 3D Printer Log Data. ORNL Technical Report ORNL/TM-2016/393, Oak Ridge National Laboratory, Oak Ridge, TN, Aug. 2016. 25 pp.
- T24. Dean N. Williams, Andrew Bauer, Aashish Chaudhary, Berk Geveci, Harinarayan Krishnan, David Bader, Timo Bremer, Charles Doutriaux, Daniel Fedor-Thurman, Matthew Harris, Elo Leung, Renata McCoy, James Ahrens, Curt Canada, Phil Jones, Boonthanome Nouanesengsy, John Patchett, Sean Williams, Thomas Maxwell, Gerald Potter, Cecelia DeLuca, Ryan O’Kuinghttons, Robert Oehmke, David Pugmire, Galen Shipman, Brian Smith, **Chad Steed**, Ben Burnett, Aritra Dasgupta, Tommy Ellqvist, David Koop, Emanuele Marques, Jorge Poco, Remi Rampin, Claudio Silva, Huy Vo, David Kindig, Alexander Pletzer, Cameron Christensen, Sidharth Kumar, Valerio Pascucci, Giorgio

- Scorzelli, Brian Summa. Ultrascale Visualization Climate Data Analysis Tools. LLNL Technical Report LLNL-TR-643624, Lawrence Livermore National Laboratory, Livermore, CA, Sep. 2013. 96 pp.
- T23. **Chad A. Steed**, Christopher T. Symons, James K. Senter, and Frank A. DeNap. Guided Text Search Using Adaptive Visual Analytics. ORNL Technical Report ORNL/TM- 2012/479, Oak Ridge National Laboratory, Oak Ridge, TN, 31 Oct. 2012. 20 pp.
- T22. **Chad A. Steed**, J. Edward Swan II, Patrick J. Fitzpatrick, and T.J. Jankun-Kelly. A Visual Analytics Approach for Correlation, Classification, and Regression Analysis. ORNL Technical Report ORNL/TM-2012/68, Oak Ridge National Laboratory, Oak Ridge, TN, 21 Feb. 2012. 30 pp.
- T21. Yu Jiao, Erik Ferragut, Sudharshan Vazhkudai, Stuart Campbell, Mark Hagen, Stephen Miller, Christopher Griffin, and **Chad A. Steed**. Massively Parallel Algorithms for Scalable Exascale Analysis. ORNL LDRD Report 31964, Oct. 2011. 2 pp.
- T20. **Chad A. Steed**, Jeffrey Russell, and J. Paquin Fabre. Under Sea Warfare Visual Analytics: Fiscal Year 2010 Prototype System Report. Memorandum Report NRL/MR/7440– 10-9285, U.S. Naval Research Laboratory, Stennis Space Center, MS, 30 Nov. 2010. 13 pp.
- T19. **Chad A. Steed**, Chiu-Fu “Tiger” Cheng, and David W. Harvey. Geophysical Data Base Variable Resolution Version 2: Final Design Report. Memorandum Report NRL/MR/7440–09-9229, U.S. Naval Research Laboratory, Stennis Space Center, MS, April 2010. 16 pp.
- T18. Kevin Shaw, John Sample, and **Chad Steed**. Environmental Components Integrations and Dissemination (ECID) Study Preliminary Report. Formal Report NRL/FR/7440–09-10,177, U.S. Naval Research Laboratory, Stennis Space Center, MS, Dec. 2009. 30 pp.
- T17. **Chad A. Steed** and David W. Harvey. Geophysical Data Base Variable Resolution Version 2: Planning Report. Formal Report NRL/FR/7440–08-10,173, U.S. Naval Research Laboratory, Stennis Space Center, MS, Jan. 2009. 12 pp.
- T16. Paul A. Elmore and **Chad A. Steed**. Algorithm Design Study for Bathymetry Fusion - Review of Current State-of-the-Art and Recommended Design Approach. Formal Report NRL/FR/7440–08-10,162, U.S. Naval Research Laboratory, Stennis Space Center, MS, Oct. 2008. 26 pp.
- T15. **Chad A. Steed**, Patrick J. Fitzpatrick, T.J. Jankun-Kelly, and J. Edward Swan II. Visual Analysis of North Atlantic Hurricane Trends Using Parallel Coordinates and Statistical Techniques. Memorandum Report NRL/MR/7440–08-9130, U.S. Naval Research Laboratory, Stennis Space Center, MS, Jul. 2008. 18 pp.
- T14. **Chad A. Steed**, Patrick Fitzpatrick, T.J. Jankun-Kelly, and J. Edward Swan II. An Interactive Parallel Coordinates Technique Applied to a Tropical Cyclone Climate Analysis. Memorandum Report NRL/MR/7440–08-9126, U.S. Naval Research Laboratory, Stennis Space Center, MS, Jun. 2008. 25 pp.
- T13. Michael M. Harris, William E. Avera, and **Chad A. Steed**. AUV Data Assimilation: Requirements, Limitations, and Recommendations. Formal Report NRL/FR/7440–08-1060, U.S. Naval Research Laboratory, Stennis Space Center, MS, May 2008. 18 pp.
- T12. Michael M. Harris, William E. Avera, John T. Sample, **Chad A. Steed**, Leonard D. Bibee, and Dave Morgerson. AN/AQS-20 Environmental Data Collection: End-to-End Demonstration 3, Tactical Sensor to Tactical Decision Aid, June 1 Through 3, 2005. Formal Report NRL/FR/7440–06-10,134, U.S. Naval Research Laboratory, Stennis Space Center, MS, Jul. 2006. 66 pp.
- T11. **Chad A. Steed**. Standard Operating Procedure for the AQS-20 Rapid Transition Project: NAVOCEANO Value Added Processes. Memorandum Report NRL/MR/7440–06-8936, U.S. Naval Research Laboratory, Stennis Space Center, MS, Mar. 2006. 7 pp.
- T10. **Chad A. Steed**, Kevyn Malpass, Edward Braithwaite, Michael M. Harris, William E. Avera, and John T. Sample. SeaBED User’s Guide. Formal Report NRL/FR/7440–06- 10,128, U.S. Naval Research Laboratory, Stennis Space Center, MS, Mar. 2006. 50 pp.
- T9. Michael M. Harris, William E. Avera, **Chad A. Steed**, and John T. Sample. AN/AQS- 20 Environmental Data Collection Demonstration 2, March 21-25, 2005. Formal Report NRL/FR/7440–05-10,113, U.S. Naval Research Laboratory, Stennis Space Center, MS, Dec. 2005. 63 pp.

- T8. Michael M. Harris, William E. Avera, **Chad A. Steed**, Leonard D. Bibee, Warren T. Wood, William D. Morgerson, and Christopher S. Robinson. Through-The-Sensor Determination of AN/AQS-20 Sensor Performance Demonstration 1, December 13 through 17, 2004. Formal Report NRL/FR/7440-05-10,106, U.S. Naval Research Laboratory, Stennis Space Center, MS, Jun. 2005. 21 pp.
- T7. **Chad A. Steed**. Results of the Conversion of the OAML SST to the GDBV Format. Formal Report NRL/FR/7440-04-10,083, U.S. Naval Research Laboratory, Stennis Space Center, MS, Sep. 2004. 15 pp.
- T6. **Chad A. Steed**. GAIT GDBV Quick Start Guide. Memorandum Report NRL/MR/7440-04-8772, U.S. Naval Research Laboratory, Stennis Space Center, MS, May 2004. 8 pp.
- T5. **Chad A. Steed**. Geophysical Data Base Variable Resolution (GDBV): Database Definition Document. Formal Report NRL/FR/7440-03-10,063, U.S. Naval Research Laboratory, Stennis Space Center, MS, Dec. 2003. 27 pp.
- T4. **Chad A. Steed** and William E. Rankin. OAML Feathering Algorithm Overview. Formal Report NRL/FR/7440-03-10,052, U.S. Naval Research Laboratory, Stennis Space Center, MS, May 2003. 10 pp.
- T3. John T. Sample, **Chad A. Steed**, Frank P. McCreedy, and Michael M. Harris. Analysis of Global and Selected Geographic Areas with Depths Between 50 and 100 Feet. Memorandum Report NRL/MR/7440-03-8295, U.S. Naval Research Laboratory, Stennis Space Center, MS, Feb. 2003. 23 pp.
- T2. **Chad A. Steed** and James E. Braud. A Flat Earth Model for DBDB-V. Formal Report NRL/FR/7440-02-10,025, U.S. Naval Research Laboratory, Stennis Space Center, MS, Aug. 2002. 12 pp.
- T1. **Chad A. Steed**, Jerry Landrum, and Christopher Moreau. PUMA-TEDS Technical Execution Plan. Formal Report NRL/FR/7440-02-10,003, U.S. Naval Research Laboratory, Stennis Space Center, MS, Jun. 2002. 32 pp.

Dissertation (1)

- D1. **Chad A. Steed**. Development of a Geovisual Analytics Environment using Parallel Coordinates with Applications to Tropical Cyclone Trend Analysis. Ph.D. Dissertation, Mississippi State University, Mississippi State, MS, Dec. 2008. 221 pp.

Patents (3 total, 1 pending and 2 awarded)

- P3. Jaydeep Karandikar, Junghoon Chae, Scott Smith, Tony Schmitz, **Chad A. Steed**. Machining Parameter Recommendations Using In-process Machining Data Aggregation, filed 30 Aug. 2023.
- P2. Thomas E. Potok, Robert Patton, **Chad A. Steed**. Method and System to Discover and Recommend Interesting Documents. 31 Jan. 2017.
- P1. **Chad A. Steed**, J. Edward Swan II, T.J. Jankun-Kelly, and Patrick J. Fitzpatrick. Information Assisted Visual Interface, System, and Method for Identifying and Quantifying Multivariate Associations. 1 Jan. 2013.

TEACHING

- 2018 DSE 512, Intro to Data Science and Computing II, Univ. of Tennessee, Knoxville
- 2015 COSC 557/494, Data Visualization, Univ. of Tennessee, Knoxville
- 2013 COSC 557/494, Data Visualization, Univ. of Tennessee, Knoxville
- 2009 CSS 360, Introduction to the UNIX Operating System, Univ. of Southern Mississippi

STUDENT MENTORING

Graduated Ph.D. Students (Academic Committee Service)

- 2015-2016 Blake Haugen, Ph.D. 2016, *Performance Analysis and Modeling of Task-based Run-times*, Department of Electrical Engineering & Computer Science, University of Tennessee, Knoxville, TN.
- 2014-2015 Benjamin W. Martin, Ph.D. 2015, *Computational Analysis of Neutron Scattering Data*, Department of Electrical Engineering & Computer Science, University of Tennessee, Knoxville, TN.

Graduated M.S. Students (Academic Committee Service)

- 2016 Gregory Simpson, M.S. 2016, *Tagamajig: Image Recognition via Crowdsourcing*, Department of Electrical Engineering & Computer Science, University of Tennessee, Knoxville, TN.
- 2016 James Furguson, M.S. 2016, *Additive Manufacturing Defect Detection using Neural Networks*, Department of Electrical Engineering & Computer Science, University of Tennessee, Knoxville, TN.
- 2015 Margaret G. Drouhard, M.S. 2015, *Visualization Techniques for Neuroscience-Inspired Dynamic Architectures*, Department of Electrical Engineering & Computer Science, University of Tennessee, Knoxville, TN.

Intern Mentoring

- 2020-2021 Daniel Joy, Oak Ridge High School Mathematics Thesis Program: Applications of data science for COVID-19 case data.
- 2020 Regan Moreno, University of Tennessee: Time series data analysis and visualization with neutron science applications.
- 2018-2019 Katherine Hausladen, Oak Ridge High School Mathematics Thesis Program: Applications of machine learning to microscopic imagery.
- 2018 Paulina Urbanowicz, Oak Ridge High School Mathematics Thesis Program: Applications of machine learning to microscopic imagery.
- 2016 David Senter, Rice University: Data visualization design principles for neutron scattering science.
- 2016 William Halsey, University of Tennessee: Visual analytics techniques for time series data.
- 2015-2016 Melissa Yuan, Oak Ridge High School Mathematics Thesis Program: Interactive data visualization of multivariate data.
- 2015-2016 Megan Peters, Oak Ridge High School Mathematics Thesis Program: Interactive data visualization of multivariate data.
- 2015 Kendall Moore, University of Southern Mississippi, B.S. Computer Science: Visualization and analysis of large-scale data.
- 2014, 2015 Meg Drouhard, University of Washington, Ph.D. Human Centered Design and Engineering: Visual analysis of social media data; Visual analysis of scientific data using virtual reality.
- 2014, 2015 Joshua Pyle, University of Tennessee, M.S. Computer Science: Visualization and analysis of social media, climate, and network flow data.
- 2014 Melva James, Clemson University, Ph.D. Computer Science: Social media mining.
- 2014 Warren de Witt, University of Tennessee, M.S. Computer Science: Biomedical visualization.
- 2012-2014, 2016 James Senter, Cornell University, B.S. Computer Science: Serious Games, evaluations, investigating swarming algorithms, text mining, social media, and visualization.
- 2011-2014 Brian Jewell, Tennessee Technological University, M.S. Computer Science: Investigating information visualization on the web.
- 2013 Adam Gillfillan, North Carolina State University, M.S. Computer Science: Visualization and analysis of cyber event data.

- 2013 Collin Bell, University of Tennessee, B.S. Computer Science: Visualization and analysis of social media data.
- 2011-2013 Christopher Maness, East Tennessee State University, B.S. Computer Science: Exploring new web-based visualization toolkits, multiple linked views, document databases, and social media analysis.
- 2012 Blake Haugen, University of Tennessee, Ph.D. Computer Science: Investigating parallel processing and I/O for climate data visual analytics.
- 2011-2012 Michael Iannacone, Georgia Tech, M.S. Computer Science: Research on web application frameworks and backend processing.
- 2009-2010 Lewis Jones, University of Southern Mississippi, Ph.D. Computer Science: Research on AUV data processing and graph visualization techniques.
- 2008-2009 Michael McCoy, Mississippi State University, BS Computer Engineering: GPGPU programming and urban structure data visualization on the web.

PROFESSIONAL SOCIETIES

Senior Member, Institute of Electrical and Electronics Engineers (IEEE) and IEEE Computer Society
Senior Member, Association of Computing Machinery (ACM)

PROFESSIONAL SERVICE

Advisory Boards: University of Tennessee Intercollegiate Undergraduate Program on Data Science
Advisory Board Member (2022-present).

Editor: Guest Editor, IEEE Computer Graphics & Applications Special Issue on Explainable AI (2021-2022).

Program Committee: IEEE Symposium on Visualization in Data Science (2017, 2018), SC Workshop on Visual Performance Analysis (2017), SPIE Visualization and Data Analysis Conference (2012, 2013–2019), IEEE VIS Arts Program (2015–2017).

Workshop Organizer: Workshop on Interactive Visual Text Analytics at IEEE VisWeek (2013).

Session Chair: ACM Conference on Intelligent User Interfaces (2015), Visualization and Data Analysis Conference (2012), MTS/IEEE Oceans (2009).

Journal Reviewer: Information Visualization (2022, 2023), ACM Trans. on Applied Perception (2016, 2017, 2020, 2021), IEEE Trans. on Visualization and Computer Graphics (2017, 2018, 2019, 2020), Journal of Imaging Science and Technology (2017), Neurocomputing (2016), ACM Trans. on Interactive Intelligent Systems (2015), GeoInformatica (2015), IEEE Computer Graphics and Applications (2013), Journal of Computational and Graphical Statistics (2013), WIREs Computational Statistics (2012, 2013), Computers & Geosciences Journal (2012), Cartography and Geographic Information Science (2011), International Journal of Geographical Information Science (2009).

Conference Reviewer: IEEE VIS Conference (2021), IEEE VIS Arts Program (2015–2017), ACM Conference on Intelligent User Interfaces (IUI) (2015), ACM CHI Conference (2015), IEEE Symposium on Biological Data Visualization (BioVis) (2014), SPIE Visualization and Data Analysis Conference (2012–2018), IEEE EuroVis Conference (2012), Hawaii International Conference on System Science (2012), IEEE Scientific Visualization Conference (2008–2013, 2015–2017), IEEE Information Visualization Conference (2009–2011, 2013–2017, 2020), IEEE Visual Analytics Science and Technology Conference (2010, 2011, 2013–2020), IEEE VisWeek Poster Session (2010), MTS/IEEE Oceans

Conference (2009), IEEE Pacific Visualization Symposium (2009, 2018), IEEE Virtual Reality Conference (2007), International Symposium on Mixed and Augmented Reality (2007).

Review Panels: DOE SBIR/STTR Phase 2 Review (2021), Texas Higher Education UTEP Data Science PhD Program Expert Review Panel (2020), Swiss NSF Reviewer (2020), NSF Information & Intelligent Systems Division (IIS) Panel (2018), DOE SBIR/STTR Phase 1 Review (2018), NSF Information & Intelligent Systems Division (IIS) Panel (2016), 2 NSF Information & Intelligent Systems Division (IIS) Panels (2015), DOE SBIR/STTR Phase 2-B Review (2014), NSF Information & Intelligent Systems Division (IIS) Panel (2014), DOE SBIR/STTR Phase 1 Review (2013), NSF Information & Intelligent Systems Division (IIS) Panel (2013), DOE SBIR Data Analysis and Visualization Phase II Review (2012), DOE SBIR Data Analysis and Visualization Phase I Review (2011), NSF Arctic Ocean Visualization (2010), SPAWAR SBIR Optimal Seafloor Mapping Technologies (2009).

Workshops: ORNL Computational and Autonomous Workflows Workshop (2020), ORNL Computational Sciences Directorate Data Strategy Workshop (2011, 2012), NRL Technical Metrics Workshop (2008), NGA NSG Urban Feature Data Conference (2008), SPAWAR TEDS Data Architecture Workshop (2002).

MEDIA COVERAGE

- 2021 “ORHS Won 1st Place at State Symposium Poster Presentation.” The Oak Ridger, June 2021, <https://www.oakridger.com/story/lifestyle/2021/06/12/oak-ridge-thesis- student-wins-1st-place-tennessee-junior-science-and-humanities-symposium-covid-19- p/7620587002/>
- 2020 “ORNL VISTA Lab.” ORNL YouTube Video Channel, December 2020, https://youtu.be/2E5rq9i8K_U
- 2020 “Visual Analytics Tool Plucks Elusive Patterns from Elaborate Datasets.” ORNL Website, July 2020, <https://www.ornl.gov/news/visual-analytics-tool-plucks-elusive- patterns-elaborate-datasets>
- 2020 “Oak Ridge’s New VISTA Lab Aims for Data Viz Breakthroughs.” HPCwire, May 2020, <https://www.hpcwire.com/2020/05/02/oak-ridges-new-vista-lab-aims-for-data-viz- breakthroughs/>
- 2019 “ORNL Launches VISTA Lab to Accelerate Vis State-of-the-art, Big Data Breakthroughs”. ORNL CCSD Website, April 2020, <https://www.ornl.gov/news/ornl-launches-vista-lab- accelerate-vis-state-art-big-data-breakthroughs-0>
- 2017 “Data Analytics for Advanced Manufacturing”. Oak Ridge National Laboratory YouTube Channel, January 2017, <https://youtu.be/0MeYx3g91D4>
- 2016 “Doctoral Student Uses Internship to Improve Big Data Visualization and Advance Career”. Oak Ridge Associated Universities (ORAU) Website, May 2016, <http://www.ornl.gov/graduate-students/profile-meg-drouhard.htm>
- 2015 “UV-CDAT Team Wins Federal Laboratory Consortium Interagency Partnership Award”. Oak Ridge Climate Change Science Institute Website, March 2015, <http://climatechangescience.ornl.gov/content/uv-cdat-team-wins-federal-laboratory- consortium-interagency-partnership-award>
- 2014 “2014 ORNL Honors and Awards”. ORNL Website, November 2014, http://web.ornl.gov/info/awards/awards14/sciencetechnology/06_EarlyCareerRes_ Steed.pdf
- 2014 “Winners of the 2013 Best Paper Awards”. Elsevier CAGEO Journal Website, March 2014, <http://www.journals.elsevier.com/computers-and-geosciences/news/winners-of- the-2013- best-paper-awards/>
- 2013 “Seeing is Believing”. OLCF Website, March 2014, <https://www.olcf.ornl.gov/2014/03/18/seeing-is-believing/>

- 2013 “ORNL wins six R&D 100s”. ORNL Website, July 2013,
<http://www.ornl.gov/ornl/news/news-releases/2013/ornl-wins-six-rd-100s>.
- 2012 “Ultra-scale Visualization – Climate Data Analysis Tools (UV-CDAT) Developing New Capabilities in Climate Data Analysis”. Oak Ridge Climate Change Science Institute Newsletter, July 2012.
- 2012 “High-level Military Visit at ORNL.” [knoxnews.com](http://blogs.knoxnews.com/munger/2012/02/high-level-military-visit-at-o.html), 8 January 2012,
<http://blogs.knoxnews.com/munger/2012/02/high-level-military-visit-at-o.html>
- 2011 “So That’s What Climate Change Looks Like.” [knoxnews.com](http://knoxblogs.com/atomiccity/2011/10/20/), 7 October 2011,
<http://knoxblogs.com/atomiccity/2011/10/20/>

COMMUNITY SERVICE

- 2018-2021 Oak Ridge Public Schools Advisory Board, Oak Ridge, TN
- 2018-2020 Mentor for the Oak Ridge High School Math Honors Thesis Program, Oak Ridge, TN
- 2015-2017 Created and maintained website for the Oak Ridge Public Schools Education Foundation (ORPSEF), Oak Ridge, TN
- 2015-2016 Mentor for the Oak Ridge High School Math Honors Thesis Program, Oak Ridge, TN
- 2015 “Hour of Code” Program Volunteer for Woodland Elementary School, Oak Ridge, TN