CHAD A. STEED

CURRICULUM VITAE

Vice President
Enterprise Data and Analytics
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Google Scholar: http://scholar.google.com/citations?user=DF2gMWkAAAAJ

Areas of specialization

Data Science • Data Wrangling • Visual Analytics • Interactive Data Visualization • Machine Learning • Statistical Analysis • Explainable AI • Cyber Security • Cyber Physical • Database Systems • Climate Science • Text Mining • Computer Graphics • Geographic Systems • Graphic Design

Technical Skills

JavaScript • Node.js • D3.js • Semantic UI • React.js • Electron.js • Jekyll • Pandas • ScikitLearn • Python • Java • C/C++ • CSS • HTML5 • HDF5 • NetCDF • SQL and NoSQL Databases • OpenGL • Git • Maven • LaTeX • Processing • Matlab • R • OmniGraffle

Honors & Awards

2021 Regions Financial Corp. Data & Analytics Associate of the Month (July)
2018 MSU Bagley College of Engineering Distinguished Fellow
2017 Inducted into the Petal High School Academic Hall of Fame
2016 ORNL Best Director's Research & Development Poster Award
2015 R&D 100 Award Finalist (for CoNNECT energy analytics system)
2014 ORNL Early-Career Researcher Award
2014 ORNL Technology Commercialization Award
2014 ORNL Significant Event Award (SEA) (for successful ACME project demonstration)
2014 Elsevier Computers & Geosciences Journal 2013 Best Paper Award
2013 ORNL Technology Commercialization Award
2013 R&D 100 Award (for DTHSTR text recommender algorithm)
2013 ORNL Significant Event Award (SEA) (for development and licensing of DTHSTR)
2002-2009 NRL Merit Award
2008 Inductee, Upsilon Pi Epsilon Honor Society
2005-2007 NRL Select Graduate
2005 NRL Technology Transfer Award (for GDBV Project)
1999 Lockheed Martin Lightning Award (for DBDB-V Project)

1999 "Best of Show" Painting Award in USM Fine Art Dept. Student Art Show
1997 USM College of Science and Technology Scholar

Education

2005–2008 Ph.D. in Computer Science (Concentration: Computer Graphics and Visualization)
Mississippi State University, Starkville, MS
Dissertation Title: "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, Robert J. Moorhead, Edward B. Allen, and Patrick J. Fitzpatrick

2002–2004 M.S. in Hydrographic Science
The University of Southern Mississippi, Hattiesburg, MS
Project Title: "A Hydrographic Survey of the Pearl River from Stennis Space Center to the I-10 Bridge"

1994–1999 B.S. in Software Engineering (Minor: Fine Art), *Honors*
The University of Southern Mississippi, Hattiesburg, MS

Professional Experience

2021–present Vice President, Enterprise Data and Analytics
Data Visualization Function Manager
Regions Financial Corporation, Birmingham, AL

I design, implement, and evaluate advanced visual analytics techniques for a variety of business units at Regions, including finance, contact center, audit, fraud, wealth management. I develop data visualization and analysis methods for data wrangling, exploratory data analysis and explainable AI tasks within the Data and Analytics group. Most of these are deployed at D3.js web applications, but I also am proficient with Tableau, PowerBI, Excel, R, Jupyter, and other data analysis applications. I also mentor junior associates, serve as a data visualization subject matter expert to the executive leadership team, evaluate and work with vendors and contractors, and help educate associates throughout the bank on best practices related to data visualization, data science, and exploratory data analysis. My responsibilities also include external publications, presentations, and editorial duties within the data visualization and data science domain as well as broad engagements with academia.
Responsibilities: Subject matter expert in advanced visual analytics and web-based data science product development; Lead web-based data visualization application developer; Advisor to executive leadership teams; Vendor evaluations and partnerships; Recruit, manage, and mentor junior staff; Create educational content about data visualization and data science for company wide distribution; Supervise and train other staff in the data visualization team; Build and maintain connections with academia and other companies.

2010–2021 Senior Research Staff and Director of the VISTA Data Exploration Laboratory
Computer Science and Mathematics Division
National Security Sciences Directorate (matrix appointment)
Oak Ridge National Laboratory, Oak Ridge, TN

I served as the Director of the Visual Informatics for Science and Technology Advances (VISTA) Laboratory and as a Senior Visual Analytics Researcher in the Computer Science and Mathematics Division at ORNL. I also had a matrix appointment to the National Security Sciences Directorate at ORNL, and I held two Joint Faculty Appointments to the University of Tennessee, where I periodically mentored students and taught computer science courses. As the founding Director of the VISTA Lab, I was responsible for leading a collaborative data exploration laboratory that served as a hub for advanced data visualization expertise at ORNL. My research focused on creating new visual analytics techniques that blended data visualizations, machine learning, and scalable databases to support effective exploratory data analysis. I applied these techniques to multi-disciplinary domains of national significance, namely cyber security, healthcare, materials science, publication mining, climate science, high performance computing, quantum computing, and manufacturing.
Responsibilities: Built a community of data visualization specialists across multiple directorates at ORNL; Led VISTA lab operations; Internal data science consulting with ORNL domain experts and leadership; Conducted research and development at both the Principal Investigator and Investigator levels; Active in the full scope of data science research and development; Established and maintained funding sources to cover my hours and those of other staff; Shared technical direction and leadership of the laboratory; Published, presented, and demonstrated to academic, industry, and military communities; Mentored students and junior research staff; Managed equipment acquisition and maintenance; Performed professional service activities; Recruited and hired new employees; Line management of data science professionals; Liaison to other divisions at ORNL.

2001-2010 Computer Scientist
Geospatial Science and Technology Branch
Marine Geosciences Division
Naval Research Laboratory, Stennis Space Center, MS

At NRL, my primary activity was developing visual analytics systems and interaction techniques for environmental data analysis. Specifically, I developed visual analytics solutions for studying tropical cyclone climate data, oceanographic data, acoustic model sensitivity, and bathymetry data. I also developed illustrative visualization techniques for ocean data sets and new environmental database architectures for bathymetric, hydrographic, geophysical, ambient noise, seafloor characterization, and unmanned vehicles.
Responsibilities: Conducted research and development at both the Principal Investigator and Investigator levels; Established and maintained funding sources; Shared technical direction and leadership of the laboratory; Published, presented, and demonstrated to academic, professional, and military communities; Management and supervision of full-time employees and graduate student interns (usually over the summer); Managed equipment acquisition and maintenance; Professional service activities; As a contracting officer technical representative (COTR), oversaw and provided technical direction to contractors.

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

After a summer internship, during which I developed an interactive map application to visualize the World Vector Shoreline Plus (WVS+) database, I was hired to serve as the Principal Investigator on a new project to transition the Digital Bathymetric Data Base Variable Resolution (DBDBV) to the Hierarchical Data Format Version 5 (HDF5) format. This project included a comparison of the HDF5 scientific format to other comparable formats (e.g., GeoTIFF, flat-file), design and development of the new database model and APIs, and development of database utilities. This project also included the development of both a standalone and web-based database visualization / access application. I was the Principal Investigator for the Naval Oceanographic Office's (NAVOCEANO) DBDBV (version 3 and 4) and Mine Warfare Bottom Sediment Type (BST) database.

Affiliations and Joint Appointments

2018–2019 Division Science Council
Computer Science and Mathematics Division
Oak Ridge National Laboratory, Oak Ridge, TN

2017–2021 Joint Faculty Appointment
The Bredesen Center for Interdisciplinary Research and Graduate Education
The University of Tennessee, Knoxville, TN

2017–2018 Division Hiring Committee
Computer Science and Mathematics Division
Oak Ridge National Laboratory, Oak Ridge, TN

2013–2021 Joint Faculty Appointment
Electrical Engineering and Computer Science Department
The University of Tennessee, Knoxville, TN

2013–2021 Research Affiliate
Climate Change Science Institute
Oak Ridge National Laboratory, Oak Ridge, TN

2012–2019 Adjunct Professor
Department of Computer Science and Engineering
Mississippi State University, Mississippi State, MS

2012–2016 Research Affiliate
Center for Intelligent Systems and Machine Learning
College of Engineering, The University of Tennessee, Knoxville, TN

2009 Adjunct Faculty
School of Computing
University of Southern Mississippi, Hattiesburg, MS

Grants & Contracts

PI or Co-PI on 39 grants or contracts for a total of $14.1M
Lead PI on 17 grants or contracts totaling $7.1M

2020 *Principal Investigator*, "Visual Informatics for Science and Technology (VISTA) Laboratory," ORNL, $250,000

2020 *Investigator*, "Virtual Anesthesiology," DoD, $75,000 (Lead PI: Tom Potok, ORNL).

2019–2020 *Investigator*, "Nuclear Nonproliferation Data Science," NNSA, $250,000 (Lead PIs: Jeremy Patterson & Philip Bingham, ORNL).

2019–2020 *Investigator*, "Power Grid Security," DOE, $250,000 (Lead PI: Mason Rice, ORNL).

2019 *Investigator*, "Health Information Technology Advanced Analytics," U.S. Dept. of Veterans Affairs, $150,000 (Lead PI: Edmon Begoli, ORNL).

2017–2020 *Principal Investigator*, "SciDAC RAPIDS Task: Temporal and Multivariate Visual Analysis," DOE ASCR, $300,000.

2017–2019 *Principal Investigator*, "Publication Mining," DOE, $700,000 (Co-PIs: Tom Potok and Robert Patton, ORNL).

2017–2018 *Principal Investigator*, "New Multi-modal Interactive Data Visualization Techniques for Scientific Data Analysis," ORNL Seed Project, $190,000 (Co-PIs: John Goodall, Junghoon Chae, and Steven Hahn, ORNL).

2016–2018 *Investigator*, "Cyber Analytics Techniques and Tools," DOE, $400,000 (Lead PI: John Goodall, ORNL).

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, $400,000 (Lead PI: Ryan DeHoff, ORNL).

2015–2016 *Principal Investigator*, "In Situ Visual Analytics for Transformative Extreme Scale Science," ORNL LDRD, $645,000 (Co-PIs: Jamison Daniel, Dali Wang, Scott Atchley, Brian Smith, and Justin Beaver, ORNL).

2015–2016 *Investigator*, "Algorithms for Context-specific Analysis of Heterogeneous Unstructured Big Health Data," ORNL LDRD, $700,000 (Lead PI: Georgia Tourassi, ORNL).

2014–2016 *Principal Investigator*, "Visual Analytics of Complex Systems," DOD, $600,000 (Co-PI: Justin Beaver, Joel Reed, ORNL).

2013–2014 *Principal Investigator*, "Interactive Analysis of High Throughput, Unstructured Information Streams," ORNL LDRD, $900,000 (Co-PIs: John Goodall, Robert Patton, Thomas Potok, and Christopher Symons, ORNL).

2012 *Investigator*, "A Scalable Framework for Timely Discovery and Situational Understanding of Cyber Attacks," ORNL LDRD, $350,000 (Lead PI: John Goodall, ORNL).

2011–2012 *Investigator*, "Citizen Engagement for Energy Efficient Communities (CoNNECT)," ORNL LDRD, $320,000 (Lead PI: Olufemi A. Omitaomu, ORNL).

2011–2012 *Investigator (Visualization Research Lead)*, "CMS Knowledge Discovery Infrastructure," Center for Medicare and Medicaid Services (CMS), $200,000 ($18M project total) (Lead PI: Wade McNair, ORNL).

2011-2012 *Principal Investigator*, "Multi-State Sharing Initiative," DHS S&T Southeast Region Research Initiative, $300,000 (Co-PIs: Christopher Symons and Frank DeNap, ORNL).

2011 *Investigator (Visualization Task Lead)*, "Scalable Connections for Diverse Information Stores: Knowledge Efficiencies for Streamlining National Health Informatics," ORNL LDRD, $150,000 (Lead PI: Wade McNair, ORNL).

2011–2013 *Investigator*, "Climate Science for a Sustainable Energy Future," DOE Office of Science, $300,000 (Lead PI: Peter Thornton, ORNL).

2010–2014 *Investigator*, "Ultra-scale Visualization Climate Data Analysis Tools," DOE Office of Science, $350,000 (Lead PI: Dean Williams, LLNL).

2010–2011 *Principal Investigator*, "Massively Parallel Algorithms for Scalable Exascale Data Analysis," ORNL LDRD, $720,000 (Lead PI: Cathy Jiao, ORNL).

2010–2011 *Investigator*, "Multi-State Sharing Initiative," DHS S&T Southeast Region Research Initiative, $150,000 (Lead PI: Frank DeNap, ORNL).

2010 *Investigator*, "Scale Dependency in Dynamical Downscaling of Extreme Climate Events over Complex Topography," ORNL LDRD, $200,000 (Lead PI: Tony King, ORNL).

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 (Lead PI: Paul Elmore, ORNL).

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 (Co-PIs: Brian Bourgeois, Will Avera, Paul Elmore, NRL).

2008–2010 *Principal Investigator*, "Undersea Semi-Submersible (USS) Vehicle," PEO-C4I & Space PMW-120 Congressional Plus-up Project, $200,000 (Co-PIs: Mike Harris and Will Avera, NRL).

2006–2009 *Investigator*, "OAML Bathymetric Data Fusion," PEO-C4I & Space METOC Futures Program, $472,000 (Lead PI: Paul Elmore, NRL).

2008 *Investigator*, "Transparent Urban Structures II," Office of Naval Research, $560,000 (Lead PI: Kevin Shaw, NRL).

2008 *Investigator*, "Metrics to Evaluate the Effectiveness of Distributed AUV Sensors," NRL Base Program 6.2, $20,000 (Lead PI: Josette Fabre, NRL).

2007 *Investigator*, "Autonomous Underwater Vehicle Data Acquisition and Planning," PEO-C4I & Space PMW-180 LBSF&I, $100,000 (Lead PI: Michael Harris, NRL).

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 (Lead PI: Michael Harris, NRL).

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

2020-2021 SnapshotVis, https://github.com/ORNL/SnapshotVis.
Description: Interactive visualizations of all pairs shortest paths derived from concepts in PubMed literature.
Web Application: https://ornl.github.io/SnapshotVis/
License: MIT License

2020-Present COVID19Vis, https://github.com/ORNL/COVID19Vis.
Description: Several dynamic visualizations of COVID-19 statistics deployed online at.

Web Application: https://ornl.github.io/COVID19Vis/
License: MIT License

2020 ORAgendaVis, https://github.com/ORNL/ORAgendaVis.
Description: Timeline visualizations of ORNL Laboratory Initiatives.
Web Application: https://ornl.github.io/ORAgendaVis/
License: MIT License

2019-2020 VitalVis, https://github.com/ORNL/VitalVis.
Description: Web-based visual analytics system for exploring patient vitals streams as time series and multivariate visualizations.
Web Application: https://ornl.github.io/VitalVis/
License: MIT License

2019-2020 Top500Vis, https://github.com/csteed/Top500Vis.
Description: Web-based visualizations of the Top 500 supercomputing list.
Web Application: http://csteed.com/Top500Vis/
License: MIT License

2016-Present CrossVis, http://github.com/ORNL/CrossVis.
Description: Expanded version of the EDEN visual analytics tool for interactive exploratory data analysis.
License: MIT License

2016-2017 Falcon, http://github.com/csteed/falcon.
Description: A visual analytics tool for interactive analysis of large time series data.
License: MIT License

2012-2016 Exploratory Data analysis ENvironment (EDEN), http://github.com/csteed/eden.
Description: A visual analytics tool for interactive analysis of large scale multivariate data sets.
License: UT-Battelle BSD License

2015 Storm Brush, http://github.com/csteed/stormbrush.
Description: A collection of algorithms for visualizing tropical cyclone information using techniques inspired by Impressionists paintings.
License: MIT License

2014 MultiVar, http://github.com/csteed/multivar.
Description: A web-based framework to investigate various ways to encode multivariate climate simulation data using the visual attributes of glyphs.
License: MIT License

Several other open source projects are available online:

- https://csteed.com
- http://github.com/csteed/
- http://gist.github.com/csteed
- http://bl.ocks.org/csteed

Publications

94 research publications (11 journal articles, 26 conference papers, 9 referred abstracts, 20 workshop or position papers, 2 book chapters, 25 technical reports, and 1 dissertation), and 3 patents. Most of these publications are available on my web site https://csteed.com/.

Journal Articles (11)

2020 **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

2019 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

2019 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

2017 **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

2015 Arvind Ramanathan, Laura L. Pullum, Tanner C. Hobson, Christopher G. Stahl, **Chad A. Steed**, Shannon P. Quinn, Chakra S. Chennubhotla, and Silvia Valkova. Discovering Multiscale 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

2015 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

2014 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

2013 **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***

2013 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 Ultra-scale 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

2009 **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

2009 **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. *Cartogra-*

phy and Geographic Information Science, 36(3):251–265, 2009. doi:10.1559/1523040097889883l4

Conference Papers (26)

2020 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

2019 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

2019 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

2016 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

2016 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.

2015 **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)

2014 **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:110.1109/BigData.2014.7004255 (49/264 [18%] acceptance rate)

2013 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

2013 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

2012 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

2012 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.

2012 **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

2012 **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)

2011 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)

2011 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

2009 **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

2009 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.

2009 **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.

2005 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

2005 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

2005 **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

2004 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.

2004 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.

2003 **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.

2003 **Chad A. Steed**, Kim Koehler, Dave Harvey, and Bruce Northridge. Geophysical Data Base Variable Resolution (GDBV): An Object-Oriented Database for Dynamic Geo-acoustic Data Storage. In *Proceedings of Oceans 2003*, San Diego, CA, pp. 132—140, MTS/IEEE, Sep. 2003. doi:10.1109/OCEANS.2003.178534

2002 **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)

2017 **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.

2016 **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.

2016 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.

2012 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.

2012 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.

2011 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.

2010 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.

2009 **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.

2007 **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)

2017 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*, Pheonix, AZ , Oct. 2017.

2016 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.

2016 **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

2016 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.

2015 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

2015 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

2015 **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.

2013 **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.

2013 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.

2013 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.

2013 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.

2013 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.

2012 **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/

2012 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/

2009 **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/

2008 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.

2008 **Chad A. Steed**. Advanced Visualization Techniques for Undersea Warfare. In *Proceedings of the NRL Technical Metrics Workshop*, Stennis Space Center, MS, May 2008.

2004 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.

2003 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.

2002 **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)

2016 **Chad A. Steed**. Interactive Data Visualization. In *Data Analytics for Intelligent Transportation*. Eds. Mashrur Chowdhury, Amy Apon, and Kakan Dey. pp. 165–190, 2017.

2013 **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 (25)

2016 **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.

2013 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.

2012 **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.

2012 **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.

2011 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.

2010 **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.

2010 **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.

2009 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.

2009 **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.

2008 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.

2008 **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.

2008 **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.

2008 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.

2006 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.

2006 **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.

2006 **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.

2005 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.

2005 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.

2004 **Chad A. Steed**. Results of the Conversion of the OAML SST to the GDBV Format. For-

mal Report NRL/FR/7440–04-10,083, U.S. Naval Research Laboratory, Stennis Space Center, MS, Sep. 2004. 15 pp.

2004 **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.

2003 **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.

2003 **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.

2003 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.

2002 **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.

2002 **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)

2008 **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, 2 awarded)

2014 **Chad A. Steed**, Thomas E. Potok, Robert Patton, Paul Bogen, and Christopher Symons. Interactive Visual Analytics for Situational Awareness of Social Media, Application No. 14/476,252, filed 3 Sep. 2014.

2017 Thomas E. Potok, Robert Patton, **Chad A. Steed**. Method and System to Discover and Recommend Interesting Documents. 31 Jan. 2017.

2013 **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

Spring 2018 DSE 512, Intro to Data Science and Computing II, University of Tennessee.

Fall 2015 COSC 557/494, Data Visualization, University of Tennessee.

Fall 2013 COSC 557/494, Data Visualization, University of Tennessee.

Fall 2009 CSS 360, Introduction to the UNIX Operating System, University of Southern Mississippi.

Student Advising & Intern Mentoring

Graduated Ph.D. Students – Academic Committee

2015–2016 Blake Haugen, Ph.D. 2016, *Performance Analysis and Modeling of Task-based Runtimes*, 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 Masters Students – Academic Committee

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

2020-21 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.

2018–19 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.

2015–16 Melissa Yuan, Oak Ridge High School Mathematics Thesis Program: Interactive data visualization of multivariate data.

2015–16 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, 15 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.

2014–15 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, 13, 14, 16 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.

2011–13 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.

2011–12 Michael Iannacone, Georgia Tech, M.S. Computer Science: Research on web application frameworks and backend processing.

2009–10 Lewis Jones, University of Southern Mississippi, Ph.D. Computer Science: Research on AUV data processing and graph visualization techniques.

2008–09 Michael McCoy, Mississippi State University, BS Computer Engineering: GPGPU programming and urban structure data visualization on the web.

Professional Service

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: 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).

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

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/

2020 "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

2019 "High School Students' Data Science Contributions Boost Biomineralization Research". U.S. Department of Energy Website, December 2019, https://www.energy.gov/articles/high-school-students-data-science-contributions-boost-biomineralization-research

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.orau.org/ornl/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, 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, 7 October 2011, http://knoxblogs.com/atomiccity/2011/10/20/

Presentations & Demonstrations

Presentations & Invited Talks

Aug. 2021 "MAVEN ExACT: Multidimensional Visual Analytics for Finance", Presentation to the Regions Corp. Continuous Improvement Committee, Online. Host: Regions Corp. CI Committee.

Jun. 2021 "Multi-dimensional Data Visualization", Regions Corp. Data360 Seminar Presentation, Online. Host: Brennan Bean.

Jun. 2021 "Temporal Data Visualization", Regions Corp. Data360 Seminar Presentation, Online. Host: Brennan Bean.

May 2021 "AI Explainability: Analytics and Visualization", Regions Corp. Data & Analytics Knowledge Cafe, Online. Host: Laks Meyyappan.

April 2021 "Multivariate Visual Analytics with Practical Applications", Regions Corp. Data & Analytics Knowledge Cafe, Online. Host: Laks Meyyappan.

Jun. 2021 "VitalVis: Visual Analytics of Multivariate Time Series Data for Healthcare", Data Visualization Session at ASA SDSS 2021, Online. Host: Brennan Bean.

Jun. 2021 "CrossVis: A Visual Analytics System for Exploring Heterogeneous Multivariate Data with Applications to Materials and Climate Science", Invited Session of Computers & Graphics journal papers for EuroVis 2021, Online. Host: Tobias Isenberg.

Feb. 2021 "Interactive Data Science Tools: Design Perspectives and Practical Scientific Applications", Invited Talk for the Clemson School of Computing Seminar Series, Clemson, SC. Host: Amy Apon.

Dec. 2020 "Practical Applications of Interactive Data Science Techniques", Invited Talk for the ORNL Cyber Resilience and Intelligence Division Geek Brief Seminar Series, Oak Ridge, TN. Host: Shaun Gleason.

Aug. 2020 "Interactive Visual Analysis of the Top500 List", Invited Talk for the University of Tennessee's

Innovative Computing Laboratory (ICL), Knoxville, TN. Host: Jack Dongarra.

July 2020 "Panel Discussion on Visualization", Invited Panel Talk for the ORNL Computational and Autonomous Workflows Workshop, Oak Ridge, TN. Host: Jay Billings.

June 2020 "Practical Visual Analytics for Data Wrangling and Exploration", Invited Talk for the ORNL Joint CSMD and CSED Seminar Series, Oak Ridge, TN. Host: Kate Evans.

April 2020 "Visualizing COVID-19 Statistics on the Web", Invited Talk for the ORNL CCSD COVID-19 Seminar Series, Oak Ridge, TN. Host: Becky Verastegui.

Feb. 2020 "Integrating Human and Machine Strengths in Scientific Analysis Through Visual Analytics", Invited Talk for the ORNL Computational Mechanics Seminar Series, Oak Ridge, TN. Host: Pablo Seleson.

Nov. 2019 "ORNL Visual Analytics Research and the ORNL VISTA Center", Invited Talk for the Georgia Tech Visual Analytics Lab, Atlanta, GA. Host: Alex Endert.

May 2018 "Inferential Visual Analytics Systems for Scientific Applications", Invited Talk for the Big Data Visualization Session at ASA SDSS 2018, Reston, VA. Host: Rida Moustafa.

Oct. 2017 "Interactive Data Visualization", Invited Lecture for Clemson Univ. Intelligent Transportation Systems Course, Clemson, SC. Host: Amy Apon.

Apr. 2017 "Interactive Data Visualization in Data Science", Invited Presentation for the Clemson School of Computing Seminar Series, Clemson, SC. Host: Eileen Kraemer.

Dec. 2016 "Advancing Additive Manufacturing Through Visual Data Science", Invited Presentation at the Symposium on Data Analytics for Advanced Manufacturing at IEEE Big Data, Washington D.C. Host: Ronay Ak.

Oct. 2016 "Advancing Additive Manufacturing Through Visual Data Science", Presentation at the Visualization in Data Science Symposium at IEEE VIS, Baltimore, MD. Host: Hanspeter Pfister.

Oct. 2016 "Advancing Additive Manufacturing Through Visual Data Science", Invited Presentation for the Clemson School of Computing Seminar Series, Clemson, SC. Host: Amy Apon.

Oct. 2016 "Advancing Additive Manufacturing Through Visual Data Science", Presentation to the ORNL Compuational Sciences and Engineering Division, Oak Ridge, TN. Host: Shaun Gleason.

Mar. 2016 "ORNL Visual Data Science", Presentation to Advanced Functional Fabrics of America visitors, Oak Ridge, TN. Host: Jeff Nichols.

Mar. 2016 "Immersive Visual Analytics for Transformative Neutron Scattering Science", Presentation at the IEEE VR 2016 Workshop on Immersive Analytics, Greenville, SC. Host: Jian Chen.

Feb. 2016 "ORNL Visual Data Science", Presentation to the ORNL Computing and Computational Sciences Directorate Advisory Committee, Oak Ridge, TN. Host: Jeff Nichols.

Nov. 2015 "Matisse: A Visual Analytics System for Exploring Emotion Trends in Social Media Text Streams", Presentation at the 3rd IEEE International Conference on Big Data. Santa Clara, CA. Host: Uwa Glasser.

May 2015 "Extreme Scale Visual Data Science", Invited Presentation at the UTK Innovative Computing Laboratory (ICL) Seminar Series. Knoxville, TN. Host: Jack Dongarra.

May 2015 "Extreme Scale Visual Analytics", Invited Presentation at the ORNL Computational and Applied Mathematics (CAM) Group Seminar Series. Oak Ridge, TN. Host: Pablo Seleson.

Feb. 2015 "Extreme Scale Visual Analytics", Invited Presentation at the UTK Center for Intelligent Systems and Machine Learning (CISML) Spring 2015 Seminar Series. Knoxville. TN, Host: Michael Berry.

Oct. 2014 "Web-based Visual Analytics for Extreme Scale Climate Science", Presentation at the 2nd IEEE International Conference on Big Data. Bethesda, MD. Host: Saumyadipta Pyne.

Sep. 2014 "Visual Analytics for Extreme Scale Science", Invited Presentation at the ORNL Spallation Neutron Source (SNS), Oak Ridge, TN. Host: Thomas Proffen.

August 2014 "Visual Analytics for Extreme Scale Science", Invited Presentation at NOAA Atmospheric Turbulence and Diffusion Division, Oak Ridge, TN. Host: Bruce Baker.

August 2014 "Visual Analytics for Extreme Scale Science", Invited Presentation at North Carolina State University's Computer Science Department, Raleigh, NC. Host: Christopher Healey.

June 2014 "In Situ Visual Analytics for Transformative Extreme Scale Science", LDRD Phase 2 Research Proposal (Computer Science and Math for Exascale Computing Focus) to the ORNL LDRD Advisory Council, Oak Ridge, TN. Host: Vladimir Protopopescu.

June 2014 "Social Media Visual Analytics", Presentation to Dr. Sean M. Kirkpatrick, Defense Intelligence Officer for S&TI, Oak Ridge, TN. Host: Brigadier Gen. (Retired) J.D. Stauffer.

May 2014 "Extreme Scale Visual Analytics", Presentation to Dr. Adedeji Badiru, Dean, Graduate School of Engineering and Management, Air Force Institute of Technology, Oak Ridge, TN. Host: Dick Webber.

Mar. 2014 "Extreme Scale Visual Analytics", Presentation to Air Force Research Laboratory (AFRL) Executive Director Mr. Ricky Peters, Oak Ridge, TN. Host: Tim Vane.

Feb. 2014 "Extreme Scale Visual Analytics", Invited Presentation at the Clemson University Visual / Human-Centered Computing Seminar Series, Clemson, SC. Host: Donald House.

Nov. 2013 "Extreme Scale Visual Analytics", Invited Paper Presentation at the 4th SuperComputing Workshop on Petascale Data Analytics, SuperComputing 2013. Denver, CO, Host: Scott Klasky.

Sep. 2013 "Social Media Visual Analytics", Presentation to Distinguished Visitors from Auburn University LTG (R) Ron Burgess, Dr. Ralph Zee, Dr. Bob Norton, Jeffrey Overby, David Umphress, and Larry Fillmer, Oak Ridge, TN. Host: Dick Webber.

July 2013 "Interactive Visual Analysis of High Throughput, Unstructured Information Streams", Presentation to ORNL Global Security Directorate's Intel and Cyber Strategic Advisory Group Meeting, Oak Ridge, TN. Host: George Fisher.

June 2013 "Interactive Visual Analysis of High Throughput, Unstructured Information Streams", ORNL Global Security Directorate LDRD Review, Oak Ridge, TN. Host: Yarom Polsky.

May 2013 "Interactive Visual Analysis of High Throughput, Unstructured Information Streams", Presentation to FBI Science and Technology Contingent, Oak Ridge, TN. Host: Brigadier Gen. (Retired) J.D. Stauffer.

Apr. 2013 "Big Data Visual Analytics", Presentation to Frederick W. Smith, Chairman and CEO of FedEx Corporation, Oak Ridge, TN. Host: Leigha Edwards.

Apr. 2013 "Big Data Visual Analytics", Invited Presentation at the University of Tennessee's Center for Intelligent Systems and Machine Learning Industry Affiliate Workshop, Knoxville, TN. Host: Michael Berry.

Mar. 2013 "Big Data Visual Analytics", Invited Presentation at the Clemson University Visual / Human-Centered Computing Seminar Series, Clemson, SC. Host: Donald House.

Jan. 2013 "Interactive Visual Analysis of High Throughput, Unstructured Information Streams", Invited Presentation to the Big Data for Defense and Homeland Security Symposium, Alexandria, VA. Host: Thomas Engelman.

Nov. 2012 "Student Research Opportunities with ORNL CDA", Invited Presentation to Dr. Mike Berry's Data Mining Class at the University of Tennessee Department of Electrical Engineering *&* Computer Science, Knoxville, TN. Host: Michael Berry.

Oct. 2012 "Interactive Visual Analysis of High Throughput Text Streams", Presentation at the 2nd Workshop on Interactive Visual Text Analytics. Seattle, WA, Host: Eser Kandogan.

Oct. 2012 "Extreme Scale Visual Analytics", Invited Presentation to the University of Tennessee Department of Electrical Engineering *&* Computer Science for Joint Faculty Appointment, Knoxville, TN. Host: Jian Huang.

Sep. 2012 "Extreme Scale Visual Analytics", Invited Seminar Presentation to the Mississippi State University Computer Science and Engineering Department, Starkville, MS. Host: Donna Reese, Department Head.

July 2012 "Visual Analytics for Climate Model Analysis", Invited Presentation to the Naval Research Laboratory, Stennis Space Center, MS. Host: Kevin Shaw, Code 7440 Branch Head.

June 2012 "Interactive Analytics for High Throughput, Unstructured Information Streams", LDRD Phase 2 Research Proposal (Global Security Focus) to the ORNL LDRD Advisory Council, Oak Ridge, TN. Host: Brent Park.

May 2012 "Visual Analytics for Climate Analysis", Invited Presentation to the Tennessee Valley Authority (TVA) River Forecast Center, Knoxville, TN. Host: Curt Jawdy.

Apr. 2012 "Visual Analytics For Social Media,", Presentation to the USNORTHCOM, Oak Ridge, TN. Host: Richard Turner.

Apr. 2012 "Big Data Lessons Learned", Presentation to Mississippi Department of Transportation Chief, Willie Huff, Oak Ridge, TN. Host: Randy Walker.

Apr. 2012 "Visual Analytics for Climate and Text Analysis", Invited Seminar Presentation to the Mississippi State University Computer Science and Engineering Department, Starkville, MS. Host: J. Edward Swan II.

Apr. 2012 "Visual Analytics for Climate and Text Analysis", Invited Seminar Presentation to the University of Tennessee Center for Intelligent Systems and Machine Learning (CISML), Knoxville, TN. Host: Scott Wells.

Mar. 2012 "CDA Visual Analytics Research Overview", Presentation to the Senate Select Committee on Intelligence Staff, Oak Ridge, TN. Host: BG (R) Rob Carr.

Mar. 2012 "Visual Analytics Tools for CLM", Invited Presentation to the Joint Land and Biogeochemistry Working Groups, NCAR Mesa Lab, Boulder, CO. Host: David Lawrence.

Jan. 2012 "Guided Text Analysis Using Adaptive Visual Analytics", Presentation at the SPIE Visualization and Data Analysis Conference, Burlingame, CA. Host: Chaomei Chen.

Oct. 2011 "An Overview of the SERRI Smart Search Analytics", Presentation to Tennessee Dept. of Safety and Homeland Security Deputy Commissioner, Larry A. Godwin, Oak Ridge, TN. Host: Wilson Lannom Jr.

Oct. 2011 "SERRI Smart Search Analytics", DHS SERRI Program Review 2011, Crystal City, VA. Host: Ben Thomas and Warren Edwards.

July 2011 "SERRI Smart Search Analytics", Presentation to NGA Program Managers (Melissa Dicker and Greg Davis), Oak Ridge, TN. Host: Jim Treadwell.

Mar. 2011 "SERRI Smart Search Analytics", Presentation to DHS/TBI Nashville Fusion Center, Nashville, TN. Host: Steve Hewitt.

Mar. 2010 "GDBV V2", Presentation at the Ocean Bottom Characterization Initiative (OBCI) Annual Reviews, Stennis Space Center, MS. Host: Marcus Speckhahn.

Mar. 2010 "Under Sea Warfare Visual Analytics", Presentation at the PEO-C4I & Space PMS-120 6.2 and 6.4 Technical Reviews, Stennis Space Center, MS. Host: Edward Mozley.

Mar. 2010 "AUV Bathymetry", Presentation at the PEO-C4I & Space PMS-120 6.2 and 6.4 Technical Reviews, Stennis Space Center, MS. Host: Edward Mozley.

Jan. 2010 "USW Visual Analytics Prototype Demonstration", Presentation and technical demonstration to NAVOCEANO ASW Subject Matter Experts, Stennis Space Center, MS. Host: David Harvey.

Dec. 2009 "New Visual Analytics and Illustrative Visualization Methods for the Analysis of Hurricane Information", Invited seminar presentation at Oak Ridge National Laboratory, Oak Ridge, TN. Host: Tom Potok.

Nov. 2009 "Guided Hurricane Trend Analysis using Enhanced Parallel Coordinates", Invited seminar talk

to the Computer Science Department at the University of Southern Mississippi, Hattiesburg, MS. Host: Jian Chen.

Nov. 2009 "The Unmanned Semi-Submersible (USS) Project", Technical Presentation at the International Technical Cooperation Program (TTCP) Annual Panel Meeting, Stennis Space Center, MS. Host: Rick Allard.

Oct. 2009 "Illustrative Visualization Techniques for Hurricane Advisory Information", Presentation at the MTS/IEEE Oceans 2009 Conference, Biloxi, MS. Host: Robert Moorhead.

Oct. 2009 "Development of the Geophysical Data Base Variable Resolution (GDBV) Version 2 Using HDF5", Presentation at the MTS/IEEE Oceans 2009 Conference, Biloxi, MS. Host: Barbara Reed.

Oct. 2009 "Undersea Warfare Visual Analytics", Presentation at the Performance Surface Management Council Meeting, COMNAVMETOCCOM, Stennis Space Center, MS. Host: Pamela McDowell.

Oct. 2009 "Guided Analysis of Hurricane Trends Using Statistical Processes Integrated with Interactive Parallel Coordinates", Presentation at the Visual Analytics Science and Technology Symposium (VAST), Atlantic City, NJ. Host: Jason Dykes.

Sep. 2009 "Database and Database Management Systems", Guest lecture to the Hydrographic Science Program at the University of Southern Mississippi, Stennis Space Center, MS. Host: Maxim van Norden.

Sep. 2009 "Geophysical Data Base Variable Resolution Version 2 (GDBV V2) Status", PMW-120 GEOglider Planning Meeting, Stennis Space Center, MS. Host: Marcus Speckhahn.

May 2009 "GDBV V2", Presentation at the PEO-C4I *&* Space PMW-120 6.2 and 6.4 Technical Reviews, Stennis Space Center, MS. Host: Edward Mozley.

May 2009 "AUV Bathymetry", Presentation at the PEO-C4I *&* Space PMW-120 6.2 and 6.4 Technical Reviews, Stennis Space Center, MS. Host: Edward Mozley.

Feb. 2009 "GDBV V2", Presentation at the CNMOC / NAVOCEANO Adaptive Sensors and Survey Techniques Program Reviews, Stennis Space Center, MS.

Feb. 2009 "AUV Bathymetry", Presentation at the CNMOC / NAVOCEANO Adaptive Sensors and Survey Techniques Program Reviews, Stennis Space Center, MS.

Mar. 2009 "GDBV V2", Presentation at the Ocean Bottom Characterization Initiative (OBCI) Program Reviews, Stennis Space Center, MS. Host: Marcus Speckhahn.

Jan. 2009 "HDF5 Issues and GDBV Background", Invited presentation at the Sensor Optimization Working Group (SOWG) Meeting, Stennis Space Center, MS. Host: Eleanor Holmes.

Oct. 2008 "Advanced Geovisual Analysis for Undersea Warfare", NRL 6.2 New Start Research Proposal Presentation to the NRL Research Advisory Council, Washington, D.C. Host: Edward Franchi.

Sep. 2008 "North Atlantic Hurricane Trend Analysis Using Parallel Coordinates and Statistical Techniques", Presentation at the GeoSpatial Visual Analytics Workshop, Park City, UT. Host: Gennady Andrienko.

May 2008 "Advanced Visualization Techniques for Undersea Warfare", Invited presentation at the NRL Technical Metrics Workshop, Stennis Space Center, MS. Host: Josette Fabre.

Apr. 2008 "Urban Operations Data: Acquisition, Fusion, and Visualization", Office of Naval Research (ONR) Transparent Urban Structures II 6.2 Technical Reviews, Arlington, VA. Host: Martin Kruger.

Mar. 2008 "GDBV V2", Presentation at PEO-C4I *&* Space PMW-120 6.2 and 6.4 Technical Reviews, Stennis Space Center, MS.

Mar. 2008 "AUV Data Assimilation and AUV Bathymetry", Presentation at the PEO-C4I *&* Space PMW-120 6.2 and 6.4 Technical Reviews, Stennis Space Center, MS.

Jan. 2008 "GDBV Version 2", Presentation at the CNMOC / NAVOCEANO Adaptive Sensors and Survey Techniques Program Reviews, Stennis Space Center, MS.

Oct. 2007 "Practical Application of Parallel Coordinates to Hurricane Trend Analysis", Presentation at IEEE Visualization 2007 Conference Poster Session, Sacramento, CA. Host: Lars Linsen.

Oct. 2007 "GDBV Version 2", Presentation at the Oceanographic and Atmospheric Master Library (OAML) Software Review Board Meeting, Stennis Space Center, MS. Host: Walt Moskal.

Jan. 2007 "GDBV Version 2", Presentation at the Ocean Bottom Characterization Initiative (OBCI) Program Reviews, Stennis Space Center, MS. Host: Marcus Speckhahn.

Sep. 2006 "Multivariate Geospatial Data Visualization Using NPR Techniques", Invited presentation to Dr. Lloyd Treinish (IBM Research), High Performance Collaboratory Mississippi State University, MS. Host: Robert J. Moorhead.

May 2005 "Data Visualization using Fledermaus for Hydrography", Guest lecture to the Hydrographic Science Program at the University of Southern Mississippi, Stennis Space Center, MS. Host: David Dodd.

Apr. 2005 "AQS-20 RTP REA Processing using VNE-NCS", Presentation at the OAML Software Review Board Meeting, Stennis Space Center, MS. Host: Walt Moskal.

Feb. 2004 "Geophysical Data Base Variable Grid (GDB-V) and Ambient Noise Database", Presentation at the CNMOC / NAVOCEANO Adaptive Sensors and Survey Techniques Program Reviews, Stennis Space Center, MS.

Apr. 2004 "GDBV Development Status", Presentation at the OAML Software Review Board Meeting, Stennis Space Center, MS. Host: Walt Moskal.

Sep. 2003 "GDBV: An Object-Oriented Database for Dynamic Geo-Acoustic Data Storage", Presentation at MTS/IEEE Oceans 2003, San Diego, CA. Host: John Lever.

July 2003 "Precision Underwater MApping (PUMA) – Submarine Tactical Decision Aid (STDA)", Presentation at the Sensor Optimization Working Group (SOWG) Meeting, Fairfax, VA. Host: Eleanor Holmes.

Apr. 2003 "Geophysical Data Base Variable Resolution", Presentation at the OAML Software Review Board Meeting, Stennis Space Center, MS. Host: Walt Moskal.

Oct. 2002 "VGRID: A Generic, Dynamic HDF5 Storage Model for Georeferenced, Grid Data", Presentation at MTS/IEEE Oceans 2002, Biloxi, MS. Host: John Lever.

Dec. 2002 "PUMA-TEDS", Presentation at the CNMOC / NAVOCEANO Adaptive Sensors and Survey Techniques Program Reviews, Stennis Space Center, MS.

Sep. 2001 "PUMA-TEDS NRL/NAVOCEANO Final Design Review", Presentation at the PUMA-TEDS Integration Final Design Review, Crystal City, VA. Host: Kim Koehler.

Demonstrations

2009 Brian Bourgeois, **Chad A. Steed**, and William E. Avera. Unmanned Semi-Submersible (USS) Sea-trial and Demonstration. Technical demonstration and sea-trials for the USS vessel at the Naval Air Station Pensacola. Pensacola, FL, Nov. 1-6, 2009.

2005 Michael M. Harris, William E. Avera, John T. Sample, **Chad A. Steed**, Leonard D. Bibee, and Dave Morgerson. AN/AQS-20 Environmental Data Collection Demonstration. Technical Demonstration for AQS-20 Rapid Transition Project at the Naval Surface Warfare Center Panama City (NSWC-PC) in conjunction with the U.S. Navy's GOMEX Mine Warfare Exercise. Panama City, FL, Jun. 2005. Results also published in NRL Formal Report NRL/FR/7440–06-10,134.

2005 Michael M. Harris, William E. Avera, **Chad A. Steed**, and John T. Sample. AN/AQS-20 Environmental Data Collection Demonstration. Technical Demonstration for AQS-20 Rapid

Transition Project, Panama City, FL, Mar. 2005. Results also published in NRL Formal Report NRL/FR/7440–05-10,113.

2004 Michael M. Harris, William E. Avera, **Chad A. Steed**, Leonard D. Bibee, Warren T. Wood, William D. Morgerson, and Christopher S. Robinson. AN/AQS-20 Through-The-Sensor Determination of Sensor Performance Demonstration. Technical Demonstration for AQS-20 Rapid Transition Project, Stennis Space Center, MS, Dec. 2004. Results also published in NRL Formal Report NRL/FR/7440–05-10,106.

Community Service

2018–2021 Oak Ridge Schools Advisory Board

2018–2020 Mentor for the Oak Ridge High School Math Honors Thesis Program

2015–2017 Created and maintained website for the Oak Ridge Public School Education Foundation (ORPSEF), `http://orpsef.org`

2015–2016 Mentor for the Oak Ridge High School Math Honors Thesis Program

2015 "Hour of Code" Program Volunteer for Woodland Elementary School, Oak Ridge, TN