

Joshua R. New, Ph.D., C.E.M., PMP, CMVP, CSM, IREE

Senior R&D Staff, Oak Ridge National Laboratory
Energy Science and Technology Directorate
Electrification and Energy Infrastructure Division
Grid-Interactive Controls Group
One Bethel Valley Road
P.O. Box 2008, MS-6324
Oak Ridge, TN 37831-6324
Phone: (865) 241-8783
newjr@ornl.gov

Education

THE UNIVERSITY OF TENNESSEE, KNOXVILLE 2004-2009 Knoxville, TN
Ph.D., Computer Science with specialization in Graphics and Visualization
Thesis: *“Visual Analytics for Relationships in Scientific Data”*
GPA: 3.9/4.0; Ph.D. Adviser: Dr. Jian Huang

JACKSONVILLE STATE UNIVERSITY 2001-2004 Jacksonville, AL
M.S., Computer Systems and Software Design with specializations in Human-Computer
Interaction, Machine Learning, Automation, Graphics, and Robotics
Thesis: *“An Advanced User Interface for Pattern Recognition in Medical Imagery:
Interactive Learning, Contextual Zooming, and Gesture Recognition”*
GPA: 4.0/4.0; Outstanding MCIS Graduate Award; M.S. Adviser: Dr. Mario Aguilar

JACKSONVILLE STATE UNIVERSITY 1997-2001 Jacksonville, AL
B.S., Computer Science & Mathematics with Physics minor; GPA: 3.5/4.0

Experience

MANAGEMENT & OPERATING CONTRACTOR

U.S. Department of Energy, Building Technologies Office 2020-Present Oak Ridge, TN

- 80% full-time equivalent on-loan to support activities of DOE’s Building Technologies Office (BTO) including transition information for the incoming Biden Administration.
- Portfolio management of 36 projects, project coordination/execution, and multi-lab strategy for the \$9.9 million/year Building Energy Modeling (BEM) subprogram under Amir Roth.
- Lead development of a multi-program “Artificial Intelligence Initiative” for Buildings.
- Support Sensors & Controls (S&C) program activities including contribution to Research & Development Opportunities (RDO) documents and associated workshops under Erika Gupta.
- Assist backfill of \$16.5 million/year Equipment program involving HVAC, refrigeration, and water heating projects under Antonio Bouza’s transition.

SENIOR RESEARCH AND DEVELOPMENT STAFF

UT-Battelle, Oak Ridge National Laboratory 2009-Present Oak Ridge, TN

- Serve as sub-program manager for “Software Tools & Models” in the ~75-person Building Technologies Research & Integration Center (BTRIC) for 9 years. Responsible for sponsor relations, securing funding, high-impact publications, and ensuring timely completion of all deliverables for projects including but not limited to: websites, web services, databases, software tools, simulation engine development, supercomputing, image processing, artificial intelligence for deep learning, and big data mining applications.
- People – responsible for multi-disciplinary team communication and development with up to 26 individuals responsible for at least 1 deliverable to the U.S. Dept. of Energy.

GRADUATE RESEARCH ASSISTANT

The University of Tennessee, Knoxville 2005-2009 Knoxville, TN

- Developed SeeShader, a glut-based framework for easily implementing General Purpose computation on Graphical Processing Units (GPGPU) applications
- Developed SeeBrain, an application which leverages OpenGL's shading language for performing many computations on the GPU. This allows mapping of quantitative hypotheses for volumetric, multivariate datasets directly to the graphics pipeline. The demonstrated results have involved diffusion-tensor MRI (DT-MRI) and the computation of tensor-based features from neural fiber streamline extraction for the purposes of real-time, query-based visualization.

RESEARCH INTERN

Oak Ridge National Laboratory Summer 2008 Oak Ridge, TN

- Extended SeeGraph to meet the visual analytics needs of the ORNL systems genetics group leader in performing complex analysis and trait mapping of microarray data across mouse genomes including automatic karyotyping.
- Part of Computational Sciences Initiative project to leverage supercomputers for model generation routines to predict variables based on 100 years of data and a comprehensive visualization framework for all model results. Tasks included parallel k-means clustering for ecoregion classification, visualization using GIS tools, experimentation with parallel coordinates for directing the analysis process, and maintenance/administration of parallel R-servers for model fitting.

RESEARCH INTERN

Oak Ridge National Laboratory Summer 2007 Oak Ridge, TN

- Extended SeeGraph using general graph algorithms and statistical techniques and applied these techniques to bioinformatics data. Worked hand in hand with domain scientists to increase the usability of the program and position it for web deployment in combination with other pre-existing, web-based tools.

GENERAL TOOLS INTERN

Vital Images, Inc. Summer 2006 Minnetonka, MN

- Part of the general tools team responsible for enhancing usability of Vitrea, a workstation product used by radiologists worldwide to inspect and diagnose 3D medical imagery. Changes made for tools including 3D angiography, vessel probe and measurements, brain perfusion, cardiac, colonography, and lung analysis.
- Primarily tasked with disambiguating click-and-drag for tool mode versus rotation mode. Developed several bypass modes including one-shot, tool over rotation, temporal threshold, and click-drag-click. Several layouts were created which load the active mode from an XML file on a per-tool basis; usability testing of these layouts was conducted. Integrated 5-button mouse support into Qt and Vitrea, used for switching modes and more advanced interaction.

RESEARCH INTERN

Oak Ridge National Laboratory Summer 2005 Oak Ridge, TN

- Part of the ORNL/UTK collaboration for the Computational Sciences Initiative. Security clearance granted for the "Large Scale Cluster-Driven Visualization of SciDAC Datasets" project to develop a suite of new visualization tools for high volume simulation datasets that can be used by visualization practitioners and application scientists alike on arbitrarily-sized clusters driving any tiled display.
- Developed SeeGraph, a 3D spring-embedded layout and graph visualization package which allows interactive viewing, selection, and manipulation of several graph-theoretic constructs and neural network filtering. This system has been applied and showcased for visualization of phenotype correlation of RI mice by ORNL biologists.

GRADUATE TEACHING ASSISTANT

The University of Tennessee, Knoxville 2004-2005 Knoxville, TN

- Developed, provided, organized, and graded course material for UTK's graduate level CS552 - Software Engineering under the guidance of Dr. Stacy Prowell. This course covered the intricacies of the incremental development model from the requirements document to maintenance of the final product. The support work for this course involved developing grading rubrics for exam material, review and guidance of deliverables for the semester-long project, and lectured 10+ times in the professor's absence.

GRADUATE RESEARCH ASSISTANT

Jacksonville State University 2001-2004 Jacksonville, AL

- Awarded a competitive research assistantship with Dr. Aguilar's Knowledge Systems Laboratory three years running. Primary languages used were C, VC6, C++.NET, and Matlab. Toolkits used include the Visualization ToolKit (VTK), Intel Image Processing Libraries (IPL), Open-source Computer Vision library (OpenCV), system-independent GUI-building toolkit (Qt), Open-source Graphics Library (OpenGL), and others.
- Development of a machine vision system completed for use in [gesture recognition](#). This system has been applied to real-time processing of live camera feed for allowing the direct manipulation of a 3D virtual object via spatial and temporal hand gestures.
- Developed a medical system, known as [Med-LIFE](#), to visualize MRI data. This system allows the fusion of multiple image modalities into colored images, creation of intelligent agents for robust segmentation of diseases in MRIs through interactive training, contextual zoom of medical imagery, and intuitive exploration including 3D techniques.

COMPUTER SPECIALIST

Ft. McClellan 1997-2001 Anniston, AL

- Primary contributor to the creation, update, and finalization of the "Automated Installation Property System" inventory tracking software used by the Transition Force to close the military post. This system was responsible for the successful transfer of 11,200,000 tons of material in 215 separate shipments amounting to a total value of approximately \$104,314,000. This system was also installed and customized for use by the Department of Justice (now Department of Homeland Security), Wastren Inc., and the Joint Powers Authority.
- Expert knowledge and application in Microsoft Access database capabilities with Visual Basic.
- Network administrator, responsible for maintaining proper operation and communication of all computers in the personal property section.
- Software/hardware troubleshooter, responsible for up-to-date operation and functionality of all computers.

Awards

- Certification: Investor Ready Energy Efficiency Professional (IREE, 2020)
- Copyright: "AutoGen" (2019) – Automatic EnergyPlus file modifier/generator – world's fastest building energy model creator utilizing text replacement for variable in EnergyPlus files. U.S. Copyright Office (Registration Number TXu 2-159-000), UT-Battelle (80000055).
- Certification: Certified Scrum Master (CSM, 2019)
- Copyright: "AutoSim" Automatic Simulator (2018) – world's fastest buildings simulator for scalably distributing EnergyPlus files on High Performance Computing devices, simulating on virtual disk, and returning results for storage and analysis. U.S. Copyright Office (Registration Number TXu 2-141-960).
- ASHRAE Distinguished Service Award (2018)
- Certification: Certified Measurement and Verification Professional (CMVP, 2018)
- Certification: Project Management Professional (PMP, 2017)

- Certification: Certified Energy Manager (CEM, 2017)
- IEEE Senior Member, bestowed on less than 8% of IEEE's more than 429,000 members (2017)
- Copyright: "EnergyPlus" (2017). UT-Battelle (OS17-00113).
- R&D 100 (2016). "Roof Savings Calculator Suite" in Software/Services. "Oscars of Innovation" award as one of the nation's top 100 most significant new products of the year.
- Copyright: "Linked-View Parallel Coordinate Plot Renderer" (2016). U.S. Copyright Office (Registration Number TXu 1-999-905), UT-Battelle (90000020).
- Copyright: "Roof Savings Calculator Suite" (2016). U.S. Copyright Office (Registration Number TXu 2-022-059), UT-Battelle (50000108).
- Lab-Corps, Cohort #1 (2015). 1 of 14 nationally-selected teams for participation in a 6-week entrepreneurial bootcamp for commercializing technologies from a national lab.

Professional Service and Development

- ASHRAE Technical Committee (TC) 1.5 – Computer Applications, Secretary (2017-), Emerging Applications subcommittee chair (2016-2017), voting member (2015-)
- ASHRAE TC 4.2 – Climatic Information, Chair (2019-), Vice Chair (2017-2019), Secretary (2015-17), voting member (2014-2018)
- ASHRAE TC 4.7 – Energy Calculations, voting member (2015-), Webmaster (2015-)
- ASHRAE Standing Standard Project Committee (SSPC) 169 – Weather Data for Building Design Standards, voting member (2015-), Secretary (2017-2019), Vice Chair (2019-); created 24% of Amercia's building codes defined by ASHRAE Standard 90.1-2016 "Energy Standard for Buildings Except Low-Rise Residential Buildings."
- Co.Starters (2016). 9-week business development program for development of the full, 26-page business plan for Tunation, LLC.

Publications

2020

1. Bass, Brett, New, Joshua R., and Copeland, William (2020). "Potential Energy, Demand, Emissions, and Cost Savings Distributions for Buildings in a Utility's Service Area." *Energies* journal, Special Issue "Designing, Modeling and Optimizing Energy and Environmental Systems for Buildings," volume 14(1), issue 132, doi.org/10.3390/en14010132, Dec. 29, 2020. [[Energies](#)] [[PDF](#)]
2. Allen-Dumas, Melissa R., Rose, Amy N., New, Joshua R., Omिताomu, Olufemi A., Yuan, Jiangye, Branstetter, Marcia L., Sylvester, Linda M., Seals, Matthew B., Carvalhaes, Thomaz M., Adams, Mark B., Bhandari, Mahabir S., Shrestha, Som S., Sanyal, Jibonananda, Berres, Anne S., Kolosna, Carl P., Fu, Katherine S., and Kahl, Alexander C. (2020). "Impacts of the Morphology of New Neighborhoods on Microclimate and Building Energy Use." *Renewable & Sustainable Energy Reviews*, volume 133, 110030, ISSN 1364-0321, doi.org/10.1016/j.rser.2020.110030, November 2020. [[RSER](#)] [[PDF](#)]

Sanyal, Jibonananda, Comstock, Kevin, Copeland, William A., Sartipi, Mina, Rodriguez, Marissa M., New, Joshua R., Gaertner, Michael, and Berres, Anne (2020). "Chattanooga - The Smart City - How a National Laboratory and a City heralded a digital transformation." *Invited Speaker* to the Global Smart Cities Council Plenary Session, Oct. 8, 2020. [[PPT](#)] [[MP4](#)]
3. New, Joshua R., Adams, Mark, Garrison, Eric, Bass, Brett and Guo, Tianjing. (2020). "Scaling Beyond Tax Assessor Data." ASHRAE/IBPSA-USA 2020 *Building Performance Analysis Conference & SimBuild* (BPACS), Chicago, IL, Sept. 29 - Oct. 1, 2020. [[PDF](#)] [[PPT](#)] [[MP4](#)]
4. Bass, Brett and New, Joshua R. (2020). "Future Meteorological Year weather data from IPCC Scenarios." ASHRAE/IBPSA-USA 2020 *Building Performance Analysis Conference & SimBuild* (BPACS), Chicago, IL, Sept. 29 - Oct. 1, 2020. [[PDF](#)] [[PPT](#)] [[MP4](#)]

5. Liu, Xiaobing, Spitler, Jeffrey D., DeGraw, Jason, Cook, Jack C., Guo, Tianjing, Adams, Mark, New, Joshua R., and Holladay, Seth (2020). "FY20 Third Milestone Report for Advanced Techno-Economic Modeling for Geothermal Heat Pump Applications in Residential, Commercial, and Industry Buildings." ORNL Internal report ORNL/SPR-2020/1619, June 30, 2020. [[OSTI](#)]

New, Joshua R. (2020). "Digital Twin of a Utility: Beyond Urban-Scale Building Energy Modeling." *Invited Speaker* to ORNL's monthly Energy Talks, Oak Ridge, TN, July 11, 2020. [[PPT](#)]

6. New, Joshua R. (2020). "Creating a Virtual Utility: Energy and Demand Opportunities via Automatic Building Energy Modeling (AutoBEM)." *DistribuTech International*, San Antonio, TX, January 28-30, 2020. [[PPT](#)]
7. Im, Piljae, Bae, Yeonjin, Joe, Jaewan, and New, Joshua R. (2019). "Empirical Validation of Building Energy Modeling for Commercial Buildings." *Journal of Applied Energy*, volume 261, issue 114374, March 2020. [[APEN](#)] [[PDF](#)]

2019

Allen-Dumas, Melissa R., New, Joshua R., and Brelsford, Christa M. (2019). "Poster: Impacts of Urban Densification on Neighborhood Heat Wave Resilience." *Proceedings of the AGU Fall Meeting*, San Francisco, CA, Dec. 9-13, 2019. [[Poster](#)]

8. New, Joshua R., Miller, William A., Huang, Yu (Joe), and Levinson, Ronnen (2019). "Comparison of different simulation programs in modeling the energy savings of cool roofs." In *Proceedings of the International Conference on Countermeasures to Urban Heat Island (IC2UHI)*, IIIT Hyderabad, Hyderabad, India, December 2-4, 2019. <!--[[PDF](#)]-->
9. Bass, Brett and New, Joshua R. (2019). "Potential Demand Reduction from Buildings in a Simulated Utility." *Invited speaker to the ACM BuildSys conference UrbSys workshop*, Columbia University New York City, NY, November 10, 2019. [[ACM](#)] [[PDF](#)] [[PPT](#)]
10. Malhotra, Mini, Im, Piljae, and New, Joshua R. (2019). "A Process for Defining Prototype Building Models: Courthouse Case Study for U.S. Commercial Energy." *Journal Energies*, volume 12, issue 4020, doi:10.3390/en12204020, October 22, 2019. [[MDPI](#)] [[PDF](#)]

New, Joshua R. (2019). "Buildings-related research: simulation, validation, and beyond urban-scale energy modeling." *Invited speaker*, Syracuse University graduate seminar, Syracuse, New York, Oct. 11, 2019. [[PPT](#)]

Hong, Tianzhen, Jain, Rishee, New, Joshua R., Reinhart, Christoph, Polly, Ben, Luo, Xuan (2019). "Panel - Urban Information and Energy Modeling." *Proceedings of the IBPSA Building Simulation Conference*, Rome, Italy, Sept. 2-4, 2019. [[PPT](#)]

11. New, Joshua R., Adams, Mark, Garrison, Eric, Copeland, William, Smith, Brian, and Campbell, Andy (2019). "Nailing the Peak: City-Scale, Building-Specific Load Factor and Contribution to a Utility's Hour of Critical Generation." *Proceedings of the IBPSA Building Simulation Conference*, Rome, Italy, Sept. 2-4, 2019. [[PDF](#)] [[PPT](#)]
12. Im, Piljae and New, Joshua R. (2019). "Empirical Validation of Building Energy Modeling using Flexible Research Platform." *Proceedings of the IBPSA Building Simulation Conference*, Rome, Italy, Sept. 2-4, 2019. [[PDF](#)] [[PPT](#)]
13. Im, Piljae and New, Joshua R. (2019). "Updated OpenStudio Small and Medium Office Prototype Models." *Proceedings of the IBPSA Building Simulation Conference*, Rome, Italy, Sept. 2-4, 2019. [[PDF](#)] [[PPT](#)]
14. New, Joshua R. (2019). "Automatic Building detection and Energy Model creation (AutoBEM) technologies for remote audit of individual buildings at urban scales." *Invited speaker to the*

- EnergyExchange*, presented as part of a seminar titled "Energy and Water Assessments: Virtual and Conventional", Denver, CO, August 20-22, 2019. [[PDF](#)]
15. Im, Piljae, Bhandari, Mahabir, and New, Joshua R. (2019). "Building Energy Model Input Specifications for the Flexible Research Platform." ORNL Internal Report ORNL/SPR-2018/947, August 2019, 28 pages.
 16. Hussein, Ahmed, Eicker, Ursula, and New, Joshua R. (2019). "A Comparison Between Two Urban-Scale Methods for The Assessment of Heat Energy Demand and Photovoltaic Potential in New York City, USA." Proceedings of the *European International Conference on Transforming Urban Systems (EICTUS)*, University of Strasbourg, France, June 26-28, 2019. [[PPT](#)]
 17. Copeland, William, New, Joshua R., and Vogel, Matthew. (2019). "Digital Twin of a City Utility: Issues, science, implementation, and results." "Data of the Future: Digital Cities" seminar of the *Better Buildings Summit*, Arlington, VA, July 11, 2019. [[PPT](#)]
 18. Shen, Bo, New, Joshua R., Ally, Moonis (2019) "Energy and Economics Analyses of Condenser Evaporative Precooling for Various Climates, Buildings and Refrigerants." In journal *Energies*, Special issue: Energy Performance and Indoor Climate Anallysis in Buildings volume 12, issue 11, May 31, 2019. [[Energies](#)]
- New, Joshua, Copeland, William, and Ingraham, James (2018). "Poster: Virtual Electric Power Board of Chattanooga, TN (EPB)." ORNL BTO Peer Review, April 15, 2019. [[Poster](#)]
- Ruysevelt, Paul. (2019). "Modelling Building Stocks and Their Energy Use." Presented at the Urban Dynamics Institute (UDI) at Oak Ridge National Laboratory, Oak Ridge, TN, Jan. 18, 2019. [[PPT](#)]
19. Garrison, Eric, New, Joshua R., and Adams, Mark (2019). "Accuracy of a Crude Approach to Urban Multi-Scale Building Energy Models Compared to 15-min Electricity Use." Best PhD Student Paper award. In *Proceedings of the ASHRAE Winter Conference*, Atlanta, GA, Jan. 12-16, 2019. [[PDF](#)] [[PPT](#)]
 20. Luo, Xuan, Macumber, Dan, New, Joshua R., and Judkoff, Ron (*Seminar Chair*) (2018). "Seminar - Multiscale Building Energy Modeling, Part 10." In *Proceedings of the ASHRAE Winter Conference*, Atlanta, GA, Jan. 12-16, 2019. [[LBNL](#)] [[NREL](#)] [[ORNL](#)]
 21. Ruysevelt, Paul, Shipley, David, Ellis, Peter, and New, Joshua R. (*Seminar Chair*) (2019). "Seminar - Multiscale Building Energy Modeling, Part 9." In *Proceedings of the ASHRAE Winter Conference*, Atlanta, GA, Jan. 12-16, 2019. [[UK](#)] [[CA](#)] [[BL](#)]
- 2018**
- New, Joshua R. (2018). "Automatic Building detection and Energy Modeling (AutoBEM)." Presented at the International Energy Agency (IEA) Energy in Buildings and Communities Programme (EBC) Annex 70 - Building Energy Epidemiology Workshop, Washington D.C., Nov. 8-9, 2018. [[PDF](#)]
- New, Joshua R. (2018). "DOE's Roof Savings Calculator." Presented at Roofing Industry Committee on Weather Issues, Inc. (RICOWI) Fall Meeting, Chicago, IL, Oct. 3, 2018. [[PDF](#)]
22. New, Joshua R. (2018). "TEDergy Talk: Automatic Building Energy Modeling (AutoBEM)." To appear in *Proceedings of the Building Performance Analysis Conference and SimBuild (BPACS)* co-organized by ASHRAE and IBPSA-USA, Chicago, IL, Sept. 26-28, 2018. [[PDF](#)] [[PPT](#)]
 23. Adams, Mark and New, Joshua R. (2018). "EnergyPlus Interior Radiant Heat Exchange Runtime Performance Improvements." To appear in *Proceedings of the Building Performance Analysis Conference and SimBuild (BPACS)* co-organized by ASHRAE and IBPSA-USA, Chicago, IL, Sept. 26-28, 2018. [[PDF](#)]

24. Adams, Mark and New, Joshua R. (2018). "EnergyPlus Performance Improvements via JSON Input Refactoring." In *Proceedings of the Building Performance Analysis Conference and SimBuild (BPACS)* co-organized by ASHRAE and IBPSA-USA, Chicago, IL, Sept. 26-28, 2018. [[PDF](#)] [[PPT](#)]

New, Joshua R. (2018). "Creating a Digital Twin of an Electric Utility: Reimagining building energy modeling in a world of high performance computing, big data, imagery, and advanced metering infrastructure." Presented at Argonne National Laboratory, Sept. 25, 2018. [[PDF](#)]
25. Im, Piljae, Fricke, Brian, New, Joshua R. and Adams, Mark (2018). "Development of a Supermarket Prototype Building Model." To appear in *Proceedings of the International Building Physics Conference* Syracuse, NY, Sept. 23-26, 2018.
26. Villa, Daniel, New, Joshua R., Adams, Mark and Garrett, Aaron (2018). "Feedback between Building Automation Systems, Building Energy Models, and Auto-Calibration." To appear in *Proceedings of the Building Performance Analysis Conference and SimBuild (BPACS)* co-organized by ASHRAE and IBPSA-USA, Chicago, IL, Sept. 26-28, 2018. [[PDF](#)]
27. New, Joshua R., Garrett, Aaron, Sanyal, Jibonananda, Slattery, Bob, Gehl, Anthony, and Miller, William A. (2019) "Big Data Mining for Assessing Calibration of Building Energy Models." In *International Journal of Computer & Software Engineering (IJCSE)*, volume 3, issue 136, Sept. 8, 2018. [[PDF](#)]
28. Palko, Greg, Thompson, Woody, Terrell, Steven, New, Joshua R., and Dovel, E.W. (2018). "Audits 1." To appear in *Proceedings of Energy Exchange 2018*, Cleveland, OH, Aug. 21-23, 2018. [[PDF](#)]
29. Rose, Amy, Allen, Melissa, Omitaomu, Femi, Yuan, Jiangye, New, Joshua R., Branstetter, Marcia, Sylvester, Linda, Seals, Matthew, Carvalhaes, Thomaz, Kolosna, Carl, Adams, Mark, Bhandari, Mahabir, Shrestha, Som, and Berres, Anne (2018). "Development of an Urban Microclimate and Energy Planning Tool (Urban-MET)." LDRD Report: 105920, LDRD LOIS #7909, July 2018.
30. Im, Piljae and New, Joshua R. (2018). "Updated OpenStudio (OS) Small Office Prototype Model." ORNL internal report ORNL/SPR-2018/885, June 2018, 20 pages.
31. Nagpal, Shreshth, Hong, Tianzhen, Cox, Matt, and New, Joshua R. (*Seminar Chair*) (2018). "Seminar 16 - Urban-Scale Energy Modeling, Part 8." In *Proceedings of the ASHRAE Conference*, Houston, TX, June 23, 2018. [[MIT](#)] [[LBNL](#)] [[GLG](#)]
32. New, Joshua R., Adams, Mark, Im, Piljae, Yang, Hsiuhan, Hambrick, Joshua, Copeland, William, Bruce, Lilian, Ingraham, James A. (2018). "Automatic Building Energy Model Creation (AutoBEM) for Urban-Scale Energy Modeling and Assessment of Value Propositions for Electric Utilities." In *Proceedings of the International Conference on Energy Engineering and Smart Grids (ESG)*, Fitzwilliam College, University of Cambridge, Cambridge city, United Kingdom, June 25-26, 2018. [[PDF](#)] [[PPT](#)]

New, Joshua R. (2018). "Automatic building detection and Building Energy Model creation (AutoBEM): Reimagining BEM in a world with High Performance Computing, Big Data, Imagery, and Advanced Metering Infrastructure." Presented to the University of Cambridge. Cambridge, UK, June 20, 2018. [[PPT](#)]
33. New, Joshua R. (2018). "Big Data Mining for Applied Energy Savings in Buildings." In *Proceedings of the 5th International Conference on Big Data Analysis and Data Mining (BigData)*, Rome, Italy, June 20-21, 2018. [[PDF](#)] [[PPT](#)]

34. New, Joshua R., Bhandari, Mahabir, Shrestha, Som, and Allen, Melissa. (2018). "Creating a Virtual Utility District: Assessing Quality and Building Energy Impacts of Microclimate Simulations." In *Proceedings of the International Conference on Sustainable Energy and Environmental Sensing (SEES)*, Cambridge, UK, June 18-19, 2018. [[PDF](#)] [[PPT](#)]
- Ingraham, James A. and New, Joshua R. (2018). "Virtual EPB." Presented to Building Technologies Office following the *BTO Peer Review*, 87 slides. Arlington, VA, May 3, 2018. [[PPT](#)]
35. New, Joshua, Adams, Mark, Garrison, Eric, Yang, Hsiuhan, Omitaomu, Olufemi, Rose, Amy (2018). "Data Sources and Assumptions Underlying Virtual-EPB Analysis." ORNL internal report ORNL/TM-2018/841, March 2018, 23 pages.
36. Malhotra, Mini, New, Joshua R., and Im, Piljae (2018). "Prototype Courthouse Building Energy Model: Building and System Characteristics." ORNL internal report ORNL/TM-2017/2, February 2018, 79 pages. [[PDF](#)]
- New, Joshua R. (2018). "Potential Impacts of Climate Change on the Built Environment and Urban Microclimates." Presented to Technical Committee 4.2 - Climatic Information. *ASHRAE Winter Conference*, 26 slides. Chicago, IL, January 23, 2018. [[PPT](#)]
37. Im, Piljae and New, Joshua R. (2018). "Updated OpenStudio (OS) Medium Office Prototype Model." ORNL internal report ORNL/SPR-2018/783, February 2018, 20 pages.
38. Leung, Luke, Phillips, Duncan, and New, Joshua R. (*Seminar Chair*) (2018). "Seminar 27 - Urban-Scale Energy Modeling, Part 7." In *Proceedings of the ASHRAE Winter Conference*, Chicago, IL, January 22, 2018. [[RWDI](#)] [[SOM](#)]

2018

39. Shen, Bo, New, Joshua R., and Baxter, Van. (2017). "Air Source Integrated Heat Pump Simulation Model for EnergyPlus." In *Journal of Energy and Buildings*, volume 156, pp. 197-206, December 2017. [[ENB](#)] [[PDF](#)]
40. New, Joshua R., Omitaomu, Olufemi, Yuan, Jiangye, Yang, Hsiuhan (Lexie), Carvalhaes, Thomaz, Sylvester, Linda, and Adams, Mark (2017). "AutoBEM: Automatic Detection and Creation of Individual Building Energy Models for Each Building in an Area of Interest." In *Proceedings of the 2nd International Energy and Environment Summit*, Dubai, UAE, November 18-20, 2017. [[PDF](#)] [[PPT](#)]
- New, Joshua R. (2017). "Automatic Building Energy Model Creation (AutoBEM) and a sampling of ORNL capabilities related to Artificial Intelligence and Buildings." Presented as part of the East Tennessee ASHRAE chapter meeting, Knoxville, TN, November 15, 2017. [[PPT](#)]
- New, Joshua R. (2017). "How to use DOE's Roof Savings Calculator." Presented as part of the Metal Building Manufacturers Association (MBMA) Energy Workshop, Atlanta, GA, November 1, 2017. [[PPT](#)]
- Kim, D., Cox S., Cho, H., and Im, P. (2017). "Performance Evaluation and Energy Savings Analysis of Variable Refrigerant Flow (VRF) Systems in U.S. Climate Locations." In *Energy Reports*, volume 3, pp. 85-93, November 2017. [[Energy Reports](#)]
41. New, Joshua R., Kumar, Jitendra, Hoffman, Forrest (2017). "Potential Impacts of Climate Change on the Built Environment: ASHRAE Climate Zones, Building Codes, and National Energy Efficiency." In *3rd Annual Congress on Pollution and Global Warming*, Atlanta, GA, October 16-18, 2017. [[PDF](#)] [[PPT](#)]

- New, Joshua R. (2017). "ORNL projects related to the Urban Dynamics Institute (UDI) and Automatic Building Energy Model creation (AutoBEM)." Presented as part of a multi-lab workshop at the *Smart Cities Week*, Washington, D.C., October 3, 2017. [[PPT](#)]
42. Edwards, Richard E., New, Joshua R., Parker, Lynne E., Cui, Borui, and Dong, Jin (2017). "Constructing Large Scale Surrogate Models from Big Data and Artificial Intelligence." In *Journal of Applied Energy*, volume 202, pp. 685-699, September 2017. [[Applied Energy](#)] [[PDF](#)]
43. Sun, Kaiyu, O'Neill, Zheng, Heo, Yeonsok, New, Joshua R. (2017). "Seminar - What's New in Building Energy Model Calibration." In *Proceedings of the Building Simulation Conference*, San Francisco, CA, August 6-8, 2017. [[PPT](#)]
- Adams, Mark B., Witte, Michael J. and Glazer, Jason (2017). "EnergyPlus IDF Workflows in a Future JSON World." Mini-workshop at the *Building Simulation Conference*, San Francisco, CA, August 6-8, 2017. [[PPT](#)]
- Kim, D., Cho, H., Im, P., and Cox, S. (2017). "Modeling and Calibration of a Variable Refrigerant Flow (VRF) System with a Dedicated Outdoor Air System (DOAS)." In *Proceedings of the Building Simulation Conference*, San Francisco, CA, August 6-8, 2017. [[PDF](#)] [[Poster](#)]
44. Carvalhaes, Thomaz, Seals, Matthew, Allen, Melissa, New, Joshua, Omitaomu, Olufemi, and Yuan, Jiangye (2017). "Developing 3D Morphologies for Simulating Building Energy Demand in Urban Microclimates Part. 1." ORNL internal report ORNL/TM-2017/354, July 2017, 29 pages.
45. New, Joshua R., Chen, Yixing, Choi, Joon-Ho, and Bass Abushakra (*Seminar Chair*) (2017). "Seminar 28 - Urban-Scale Energy Modeling, Part 5" presenting "Automatic Building Energy Model Creation (AutoBEM)." In *Proceedings of the ASHRAE Annual Conference*, Long Beach, CA, June 26, 2017. [[ORNL](#)] [[LBNL](#)] [[USC](#)]
46. Muehleisen, Ralph, Crawley, Drury, and Joshua New (*Seminar Chair*) (2017). "Seminar 55 - Urban-Scale Energy Modeling, Part 6." In *Proceedings of the ASHRAE Annual Conference*, Long Beach, CA, June 28, 2017. [[ANL](#)] [[Bentley](#)]
- Pallin, Simon, Stockdale, Michaela, Boudreaux, Philip, Buechler, Elizabeth, and Carpenter, Jared (2017). "Effects of air leakage on buildings overall thermal resistances based on U.S. climate zones." In *Proceedings of the 2017 ASHRAE Conference*, Long Beach, CA, June 24-28, 2017.
47. Bhandari, Mahabir, Shrestha, Som, New, Joshua R., and Allen, Melissa (2017). "Comparison of Microclimate Simulated Weather Data to ASHRAE Clear Sky Model and Measured Data." ORNL internal report ORNL/TM-2017/241, April 2017, 27 pages.
48. Allen, Melissa, Rose, Amy, New, Joshua, Omitaomu, Femi, Yuan, Jiangye, and Branstetter, Marcia (2017). "Understanding the Relationships among City Microclimate, Morphology, and Energy Use." In *Proceedings of the 2017 American Association of Geographers*, Boston, MA, April 2017. [[PDF](#)] [[PPT](#)]
- New, Joshua R., Adams, Mark, Bhandari, Mahabir, Shrestha, Som, and Sanyal Jibonananda (2017). "Auto-generated Building Energy Models (AutoBEM) of Urban Morphologies and Analysis of Microclimate Interaction." Presented to the Urban Dynamics Institute Scientific Advisory Board, March 23, 2017. [[Poster](#)]
49. Pallin, Simon, Boudreaux, Philip, Shrestha, Som, Adams, Mark, and New, Joshua R. (2017). "State-of-the-Art for Hygrothermal Simulation Tools." ORNL internal report ORNL/TM-2017/92, March 30, 2017, 22 pages.
- Ozmen, Ozgur, Nutaro, James, Sanyal, Jibonananda, Olama, Mohammed (2017). "Simulation-based Testing of Control Software." ORNL internal report ORNL/TM-2017/45, February 28, 2017, 27 pages. [[PDF](#)]

- Srivastava, Prateek, Khan, Yasin, Mathur, Jyotirmay and Bhandari, Mahabir (2017). "Analysis of Radiant Cooling System Integrated with Cooling Tower for Composite Climatic Conditions." In *Proceedings of the Building Simulation Conference*, San Francisco, CA, August 6-8, 2017.
- Mathur, Jyotirmay, Bhandari, Mahabir, Khan, Yasin (2017). "Energy-Saving Potential of a Radiant Cooling System in Different Climate Zones of India." In *Journal of Science and technology for the Built Environment*.
- Mathur, Jyotirmay, Bhandari, Mahabir, Kumar, Vivek, Khan, Yasin and Kumar, Prateek (2017). "Development of Heat Transfer Model for Ceiling Radiant Cooling Panel through Combined Experimental and Simulation Study." In *Journal of ASHRAE Transaction*, poster in *Proceedings of the ASHRAE Winter Conference*, Las Vegas, NV, January 1, 2017.
50. Im, Piljae, Bhandari, Mahabir, and New, Joshua R. (2017). "Calibrated EnergyPlus Model of Flexible Research Platform (FRP) with Baseline RTU-VAV Reheat System." ORNL internal report ORNL/TM-2017/4, January 31, 2017, 22 pages.
51. Im, Piljae and New, Joshua R. (2017). "Updated OpenStudio (OS) Large Office Prototype Model." ORNL internal report ORNL/TM-2017/1, January 31, 2017, 19 pages.
52. Allen, Melissa, Bobker, Michael, Khan, Haider, Crawley, Drury, and Joshua New (*Seminar Chair*) (2017). "Seminar 55 - Urban-Scale Energy Modeling, Part 4." In *Proceedings of the ASHRAE Winter Conference*, Las Vegas, NV, January 31, 2017. [[ORNL](#)] [[CUNY](#)] [[ICF](#)] [[Bentley](#)]
53. Hong, Tianzhen, Muehleisen, Ralph, Long, Nicholas, and Joshua New (*Seminar Chair*) (2017). "Seminar 43 - Urban-Scale Energy Modeling, Part 3." In *Proceedings of the ASHRAE Winter Conference*, Las Vegas, NV, January 31, 2017. [[LBL](#)] [[ANL](#)] [[NREL](#)]
- Judkoff, Ron, Haves, Phil, Im, Piljae, and Muehleisen, Ralph. (2017). "Validation and Uncertainty Characterization for Energy Simulation." Presented to ASHRAE SSPC 140, January 30, 2017. [[NREL](#)] [[ORNL](#)] [[ANL](#)] [[LBL](#)]
- Buechler, Elizabeth, Pallin, Simon, Boudreaux, Philip, and Stockdale, Michaela (2017). "Probabilistic modeling of the indoor climates of residential buildings using EnergyPlus." In *Journal of Building Physics*.
- 2016**
54. Adams, Mark, Shires, Preston, Burova, Ksenia and New, Joshua R. (2016). "EnergyPlus Refactoring and Performance Improvements." ORNL internal report ORNL/TM-2016/342, December 28, 2016, 15 pages.
55. Im, Piljae, New, Joshua R., and Bhandari, Mahabir S. (2016). "MultiYear Plan for Validation of EnergyPlus Multi-Zone HVAC System using ORNL's Flexible Research Platform." ORNL internal report ORNL/TM-2016/286, October 20, 2016, 22 pages. [[ORNL](#)] [[PDF](#)]
- Adams, Mark, and Martin, Chris. (2016). "OpenStudio Refactor and Performance Improvements." ORNL internal report ORNL/TM-2016/342, October 4, 2016, 20 pages.
- New, Joshua R. (2016). "Autotune calibrates models to building use data." Oak Ridge, TN, August 26, 2016. [[YouTube](#)]
56. Chaudhary, Gaurav, New, Joshua R., Sanyal, Jibonananda, Im, Piljae, O'Neill, Zheng, and Garg, Vishal (2016). "Evaluation of 'Autotune' Calibration Against Manual Calibration of Building Energy Models." In *Journal of Applied Energy*, volume 182, pp. 115-134, August 2016. [[PDF](#)]

- Ozmen, Ozgur, Nutaro, James, and Sanyal, Jibonananda. (2016). "Simulation-Based Testing of Control Software via Functional Mock-Up Unit Integration." To appear in *Proceedings of the North America Modelica Users' Group Conference*, Troy, MI, September 29, 2016.
57. Brown, Jason, Allen, Melissa, Scheer, David, and Joshua New (*Seminar Chair*) (2016). "Seminar 56 - Data Sources toward Urban-Scale Energy Modeling, Part 2." In *Proceedings of the ASHRAE Annual Conference*, St. Louis, MO, June 29, 2016. [[GATech](#)] [[ORNL](#)] [[Autodesk](#)]
- New, Joshua R. (2016). "How to Use the Roof Savings Calculator." Oak Ridge, TN, July 22, 2016. [[YouTube](#)]
58. Cerezo, Carlos, Heo, Yeonsook, and Joshua New (*Seminar Chair*) (2016). "Seminar 39 - Data Sources toward Urban-Scale Energy Modeling, Part 1." In *Proceedings of the ASHRAE Annual Conference*, St. Louis, MO, June 28, 2016. [[MIT](#)] [[UK](#)]
59. New, Joshua R. (2016). "Design of Experiments: Statistical Confidence with Fewer Simulations" presented as part of "Seminar 22 - Large-Scale Computing." In *Proceedings of the ASHRAE Annual Conference*, 25 slides, St. Louis, MO, June 27, 2016. [[PPT](#)]
- Bhandari, Mahabir, Im, Piljae, and New, Joshua R. (2016). "Validation and Uncertainty Characterization for Energy Simulation." Presented to ASHRAE Standing Standard Project Committee 140 (SSPC 140). St. Louis, MO, June 27, 2016. [[PPT](#)]
60. Ozmen, Ozgur, Nutaro, James, Mark, and New, Joshua R. (2016). "Parallel Execution of Functional Mock-up Units in Buildings Modeling." ORNL internal report ORNL/TM-2016/173, June 15, 2016, 33 pages. [[ORNL](#)] [[PDF](#)]
- New, Joshua R. (2016). "Software Tools and Modeling for Building Energy Efficiency." Presented to the Polyisocyanurate Insulation Manufacturers Association (PIMA). Oak Ridge, TN, June 8, 2016. [[PPT](#)]
61. Im, Piljae, New, Joshua R., and Bhandari, Mahabir S. (2016). "Validation Plan for EnergyPlus Multi-Zone HVAC System using ORNL's Flexible Research Platforms." ORNL internal report ORNL/TM-2016/101, June 1, 2016, 22 pages.
- New, Joshua R. (2016). *Invited Speaker*. "How to use DOE's Roof Savings Calculator." Presented at the International Radiant Insulation Manufacturers' Conference (I-RIM) pre-show event. Hollywood, FL, May 31, 2016. [[PPT](#)]
62. Shen, Bo, Adams, Mark, New, Joshua R. (2016). "EnergyPlus Air Source Integrated Heat Pump Model." ORNL internal report ORNL/TM-2016/141, April 7, 2016, 23 pages.
63. New, Joshua R., Miller, William A., Huang, Yu (Joe), and Levinson, Ronnen. (2016). "Comparison of Software Models for Energy Savings from Cool Roofs" [Special issue]. *Journal of Energy and Buildings on Countermeasures to Urban Heat Island*, volume 114, issue 0, pp. 130-135, February 2016. [[ENB](#)] [[PDF](#)]
- Rose, Amy, Allen, Melissa, Omitaomu, Olufemi, Yuan, Jiangye, New, Joshua R., Branstetter, Marcia, and Wilbanks, Thomas (2016). "Modeling Urban Energy Savings Scenarios using Earth System Microclimate and Urban Morphology." Poster presented to the Urban Dynamics Institute. Oak Ridge, TN, February 2, 2016. [[Poster](#)]
- Sanyal, Jibonanda and New, Joshua R. (2016). "Supercomputer Assisted Generation of Machine Learning Agents for the Calibration of Building Energy Models." Poster presented the Urban Dynamics Institute. Oak Ridge, TN, February 2, 2016. [[Poster](#)]

- New, Joshua R. (2016). "Validation using ORNL Flexible Research Platform 2." Presented to ASHRAE Standing Standard Project Committee 140 (SSPC 140). Orlando, FL, January 25, 2016. [[PPT](#)]
64. Garrett, Aaron and New, Joshua R. (2016). "Suitability of ASHRAE Guideline 14 Metrics for Calibration." Technical paper. To appear in *Proceedings of the ASHRAE Winter Conference and ASHRAE Transactions 2016, volume 122, part 1*, Orlando, FL, January 23-27, 2016.
65. New, Joshua R. (2016). "Autotune Calibration and Trinity Test Evaluation" presented as part of "Seminar - Simulation Calibration Methods: Which Should I Choose?" To appear in *Proceedings of the ASHRAE Winter Conference*. Orlando, FL, January 27, 2016. [[PPT](#)]
- 2015**
- Allen, Melissa, Rose, Amy, Branstetter, Marcia, Yuan, Jiangye, New, Joshua R., Omitaomu, Olufemi, and Wilbanks, Thomas (2015). "Modeling Urban Energy Savings Scenarios using Earth System Microclimate and Urban Morphology." Presented for the American Geophysical Union, 14 slides. San Francisco, CA, December 14-18, 2015. [[PPT](#)]
66. Sanyal, Jibonananda, New, Joshua R., Nutaro, James, and Kuruganti, Teja (2015). "The Modbus Definition Language Specification: A First Step Towards Device Interoperability." To appear in *Proceedings of the Building Simulation 2015 Conference*, Hyderabad, India, December 7-9, 2015. [[PDF](#)] [[PPT](#)]
67. Huang, Yu (Joe), New, Joshua R., Miller, William A., and Levinson, Ronnen (2015). "A Web-Based Simulation Tool on The Performance of Different Roofing Systems." To appear in *Proceedings of the Building Simulation 2015 Conference*, Hyderabad, India, December 7-9, 2015. [[PDF](#)] [[PPT](#)]
- New, Joshua R. (2015). "Software vs. Reality - Bridging the Gap." *Invited Speaker*. Presented for the IBPSA-North Texas Chapter, 32 slides, webinar. Oak Ridge, TN, October 28, 2015. [[PPT](#)]
- New, Joshua R. (2015). "DOE's Roof Savings Calculator." *Invited Keynote Speaker*. Presented at the Radiant Insulation Manufacturer's Association International (RIMA-I), 47 slides. Tampa Bay, FL, October 24, 2015. [[PPT](#)]
68. Yuan, Jiangye, New, Joshua R., Sanyal, Jibonananda, and Omitaomu, Olufemi (2015). "Urban Search Data Sources." ORNL internal report ORNL/TM-2015/397, July 31, 2015, 70 pages.
- New, Joshua R. (2015). "Autotune Calibration and Uncertainty Quantification." Presented at the International Building Performance Simulation Association (IBPSA-USA) Summer Meeting, 37 slides. Atlanta, GA, June 28, 2015. [[PPT](#)]
- New, Joshua R. (2015). "DOE's Roof Savings Calculator." Presented at the EVEREST Visualization Room for the EPDM Roofing Association, 51 slides. Oak Ridge, TN, April 29, 2015. [[PPT](#)]
69. Garrett, Aaron and New, Joshua R. (2015). "Scalable Tuning of Building Energy Models to Hourly Data." In *Journal of Energy*, volume 84, pp. 493-502, April 2015. [[Energy](#)] [[PDF](#)]
- New, Joshua R. (2015). "Data Analytics and Modeling for Building Energy Efficiency." Presented at the Maxlab Visualization Room for David Danielson, Joyce Yang, Roland Risser, and Mark Johnson, 19 slides. Oak Ridge, TN, April 8, 2015. [[PPT](#)]
70. Stone, Jackson, Sanyal, Jibonananda, Castello, Charles, and New, Joshua R. (2015). "Gamification: A New Approach to Data Analysis" In *Proceedings of the Modeling and Simulation (MODSIM) World 2015 Conference*, Virginia Beach, VA, March 30-April 2, 2015.

- New, Joshua R. (2015). "ORNL Flexible Research Platforms." Presented at the *Workshop for Empirical Validation of Whole Building Energy Simulation Programs*, 41 slides. Chicago, IL, January 28, 2015. [[PPT](#)]
71. New, Joshua R. (2015). "Autotune Calibration" presented as part of "Seminar 55 - Simulation Calibration." In *Proceedings of the ASHRAE Winter Conference*, 22 slides. Chicago, IL, January 28, 2015. [[PPT](#)]
- New, Joshua R. (2015). "Visualization and Software Simulations for Actualized Energy Savings." Presented at *ASHRAE Local Chapter Meeting*, 62 slides. Knoxville, TN, January 21, 2015. [[PPT](#)]
- 2014**
72. Garrett, Aaron and New, Joshua R. (2014). "A Scientific Study of Automated Calibration applied to DOE Commercial Reference Buildings." ORNL internal report ORNL/TM-2014/709, automated/reproducibile report, December 31, 2014, 114 pages.
73. Gehl, Anthony C., Munk, Jeffrey D., Jackson, Roderick K., Boudreaux, Philip R., Miller, William A., and New, Joshua R. (2014). "Final Review of the Campbell Creek Demonstrations showcased by the Tennessee Valley Authority." ORNL internal report ORNL/TM-2014/666, December 31, 2014, 42 pages.
- New, Joshua R. (2014). "Autotune." Presented at *Consortium for Building Energy Innovation's 2nd Annual Building Energy Informatics Summit*, 29 slides. Philadelphia, PA, December 19, 2014. [[PPT](#)]
- New, Joshua R. (2014). "Simulation-informed Optimization and Techniques for Big Data Mining." Presented at *Urban Dynamics Institute Seminar Series*, 60 slides. Oak Ridge, TN, November 17, 2014. [[PPT](#)]
74. Miller, William A., Shrestha, Som, Gu, Lixing, and New, Joshua R. (2014). "A Comparison of Simulation Capabilities for Ducts." ORNL internal letter report ORNL/LTR-2014/283, November 24, 2014, 54 pages. [[ORNL](#)] [[PDF](#)]
- New, Joshua R. (2014). "Autotune Building Models: Calibration, Simulation Data, and Data Mining." Presented at *Data Science Seminar Series*, 67 slides. Oak Ridge, TN, October 23, 2014. [[PPT](#)]
75. New, Joshua R., Miller, William A., Huang, Yu (Joe), and Levinson, Ronnen. (2014). "Comparison of Software Models for Energy Savings from Cool Roofs." In *Proceedings of the 3rd International Conference on Countermeasures to Urban Heat Island (IC2UHI)*, Venice, Italy, October 13-15, 2014. [[PDF](#)] [[PPT](#)]
76. Sanyal, Jibonananda and New, Joshua R. (2014). "Building Simulation Modelers - Are We Big Data Ready?" In *Proceedings of the ASHRAE/IBPSA-USA Building Simulation Conference*, pp. 449-456, Atlanta, GA, September 10-12, 2014. [[ASHRAE](#)] [[PDF](#)] [[PPT](#)]
77. Ostrouchov, George, New, Joshua R., Sanyal, Jibonananda, and Patel, Pragnesh (2014). "Uncertainty Analysis of a Heavily Instrumented Building at Different Scales of Simulation." In *Proceedings of the 3rd International High Performance Buildings Conference*, Purdue, West Lafayette, IN, July 14-17, 2014. [[PDF](#)] [[PPT](#)]
78. New, Joshua R. and Sanyal, Jibonananda. (2014). "Supercomputers (Titan!), Big Data Analytics, and Energy Efficient Robo-Homes." In *Codestock*, 77 slides. Knoxville, TN, July 11-12, 2014. [[PPT](#)]
- Kumar, Jitendra, Hoffman, Forrest M., New, Joshua R., and Sanyal, Jibonananda (2014). "Reimagining Climate Zones for Energy Efficient Building Codes." Presented to Technical

Committee 4.2 - Climatic Information, Research subcommittee. *ASHRAE Annual Conference 2014*, 25 slides. Seattle, WA, June 28-July 2, 2014. [[PPT](#)]

79. Castello, Charles C., Sanyal, Jibonananda, Rossiter, Jeffrey S., Hensley, Zachary P., and New, Joshua R. (2014). "Sensor Data Management, Validation, Correction, and Provenance for Building Technologies." Technical paper TRNS-00223-2013.R1. In *Proceedings of the ASHRAE Annual Conference and ASHRAE Transactions 2014*, Seattle, WA, June 28-July 2, 2014. [[PDF](#)] [[PPT](#)]

80. New, Joshua R., Levinson, Ronnen, Huang, Yu (Joe), Sanyal, Jibonananda, Miller, William A., Mellot, Joe, Childs, Kenneth W., and Kriner, Scott (2013). "In-Depth Analysis of Simulation Engine Codes for Comparison with DOE's Roof Savings Calculator and Measured Data." ORNL internal report ORNL/TM-2014/218, June 27, 2014, 69 pages.

New, Joshua R. (2014). "Roof Savings Calculator and Autotune." Presented two posters as part of *ORNL's Software Expo*. Oak Ridge, TN, May 7, 2014.

New, Joshua R. (2014). *Invited Speaker*. "Software vs. Reality - Bridging the Gap." *Building Technologies Research and Integration Center Science Research Seminar Series*, ORNL internal presentation 49608, 93 slides. Oak Ridge, TN, May 2, 2014.

81. Sanyal, Jibonananda, New, Joshua R., Edwards, Richard E., and Parker, Lynne E. (2014). "Calibrating Building Energy Models Using Supercomputer Trained Machine Learning Agents." In *Journal on Concurrency and Computation: Practice and Experience*, volume 26, issue 13, pp. 2122-2133, September 10, 2014. [[CCPE](#)] [[PDF](#)]

82. Sanyal, Jibonananda and New, Joshua R. (2013). "Oak Ridge Institutional Cluster Autotune Test Drive Report." ORNL internal report, February 17, 2014, 6 pages.

83. Mellot, Joe, New, Joshua R., and Sanyal, Jibonananda. (2014). "Cool Roofing: Analysis of Energy Consumption for Cool Roofing." In *Western Roofing - Insulation and Siding*, issue January/February, volume 37, number 1, pp. 50-56, February, 2014.

New, Joshua R. (2014). *Invited Speaker*. "DOE's Roof Savings Calculator." *Metal Construction Association's (MCA) MetalCon Roofing Council*, Clearwater Beach, FL, January 27, 2014. [[PPT](#)]

84. New, Joshua R., Bhaduri, Budhendra L., Ott, Ron, and Roth, Stephen B. (2014). "Emerging Technologies in the Built Environment: Geographic Information Science (GIS), 3D Printing, and Additive Manufacturing." Multi-speaker seminar in *Proceedings of the ASHRAE Winter Conference*, New York, NY, January 19, 2014. [[PPT](#)] [[PPT](#)]

2013

85. Hensley, Zachary P., Sanyal, Jibonananda, and New, Joshua R. (2014). "Provenance in Sensor Data Management: A Cohesive, Independent Solution for Bringing Provenance to Scientific Research." In *Communications of the ACM*, volume 57, issue 2, pp. 55-62, December 2013 and *ACM Queue*, volume 11, issue 12, pp. 1-14, December 2013. Video featured in the ACM Digital Library. [[ACM](#)] [[Queue](#)] [[PDF](#)]

86. Edwards, Richard E., Zhang, Hao, New, Joshua R., and Parker, Lynne E. (2013). "Approximate 1-fold Cross-Validation with Least Squares SVM and Kernel Ridge Regression." In *Proceedings of the IEEE 12th International Conference on Machine Learning and Applications (ICMLA13)*, Miami, FL, December 4-7, 2013. [[PDF](#)] [[PPT](#)] [[PPT](#)]

87. Smith, Matt K., Castello, Charles C., and New, Joshua R. (2013). "Machine Learning Techniques Applied to Sensor Data Correction in Building Technologies." In *Proceedings of the IEEE 12th International Conference on Machine Learning and Applications (ICMLA13)*, Miami, FL, December 4-7, 2013. [[PDF](#)] [[Poster](#)]

88. Castello, Charles C., New, Joshua R., and Smith, Matt K. (2013). "Autonomous Correction of Sensor Data Applied to Building Technologies Using Filtering Methods." In *Proceedings of the IEEE Global Conference on Signal and Information Processing (GlobalSIP)*, Austin, TX, December 3-5, 2013. [[PDF](#)] [[Poster](#)]
89. New, Joshua R., Huang, Yu (Joe), Levinson, Ronnen, Mellot, Joe, Sanyal, Jibonananda, Miller, William A., and Childs, Kenneth W. (2013). "Analysis of DOE's Roof Savings Calculator with Comparison to other Simulation Engines." ORNL internal report ORNL/TM-2013/501, November 1, 2013, 63 pages.

New, Joshua R. (2013). *Invited Speaker*. "Science Behind ORNL's Building Technology Research Integration Center (BTRIC)." *Roof Coating Manufacturer's Association*, Oak Ridge, TN, October 8, 2013. [[PPT](#)]
90. Mellot, Joseph W., New, Joshua R., and Sanyal, Jibonananda. (2013). "Preliminary Analysis of Energy Consumption for Cool Roofing Measures." In *RCI Interface Technical Journal*, volume 31, issue 9, pp. 25-36, October, 2013. [[RCI](#)] [[PDF](#)]
91. Edwards, Richard E., New, Joshua R., and Parker, Lynne E. (2013). "Estimating Building Simulation Parameters via Bayesian Structure Learning." In *Proceedings of the 2nd International Workshop on Big Data, Streams and Heterogeneous Source Mining: Algorithms, Systems, Programming Models and Applications (BigMine13)*, part of the *19th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD2013)*, Chicago, IL, August 11, 2013. [[PDF](#)] [[Poster](#)]
92. Hensley, Zachary, Sanyal, Jibonananda, and New, Joshua R. (2013). "ProvDMS -- A Provenance Data Management System for Sensor Data." Presented as part of the Science Undergraduate Laboratory Internships (SULI) program, August 8, 2013. [[OSTI](#)] [[PDF](#)] [[Poster](#)]
93. Ranjan, Niloo, Sanyal, Jibonananda, and New, Joshua R. (2013). "In-Situ Statistical Analysis of Autotune Simulation Data using Graphical Processing Units." Presented as part of the Science Undergraduate Laboratory Internships (SULI) program, August 8, 2013. [[PDF](#)] [[Poster](#)]
94. Smith, Matt K., Castello, Charles C., and New, Joshua R. (2013). "Sensor Validation with Machine Learning." Presented as part of the Science Undergraduate Laboratory Internships (SULI) program, July 29, 2013. [[PDF](#)] [[Poster](#)]
95. Sanyal, Jibonananda, New, Joshua R., and Edwards, Richard E. (2013). "Supercomputer Assisted Generation of Machine Learning Agents for the Calibration of Building Energy Models." In *Proceedings of the Extreme Science and Engineering Discovery Environment (XSEDE13) Conference* and selected to be featured in *Lightning Talks*, San Diego, CA, July 22-25, 2013. [[PDF](#)] [[PPT](#)] [[Poster](#)]
96. Sanyal, Jibonananda, New, Joshua R., and Edwards, Richard E. (2013). "Calibration of Building Energy Models: Supercomputing, Big-Data and Machine-Learning." In *Proceedings of the ORNL Postdoc Symposium*. Oak Ridge, TN, July 19, 2013. [[PDF](#)]
97. Garrett, Aaron, New, Joshua R., and Chandler, Theodore (2013). "Evolutionary Tuning of Building Models to Monthly Electrical Consumption." Technical paper DE-13-008. In *Proceedings of the ASHRAE Annual Conference and ASHRAE Transactions 2013*, volume 119, part 2, pp. 89-100, Denver, CO, June 22-26, 2013. [[PDF](#)] [[PPT](#)]
98. Edwards, Richard E. (2013). "Automating Large-Scale Simulation Calibration to Real-World Sensor Data." Doctoral Committee: Lynne E. Parker (advisor), Joshua R. New, Michael Berry, Hamparsum Bozdogan, and Husheng Li. A Dissertation presented for the Doctor of Philosophy Degree in *Archives of The University of Tennessee*, Knoxville, TN, March 13, 2013. [[PDF](#)] [[PPT](#)]

99. Edwards, Richard E., Parker, Lynne E., and New, Joshua R. (2013). "MLSuite Software Transfer Document." ORNL internal report ORNL/TM-2013/131, May 8, 2013, 36 pages. [[PPT](#)]
100. Sanyal, Jibonananda and New, Joshua R. (2013). "Simulation and Big Data Challenges in Tuning Building Energy Models." In *Proceedings of the IEEE Workshop on Modeling and Simulation of Cyber-Physical Energy Systems (MSCPES)*, Berkeley, CA, May 20, 2013. Republished in *IEEE Xplore* October, 2013. [[IEEE](#)] [[PDF](#)] [[PPT](#)]
101. Mellot, Joseph W., Sanyal, Jibonananda, and New, Joshua R. (2013). "Preliminary Analysis of Energy Consumption for Cool Roofing Measures." Presented at the International Reflective Roofing Symposium, the American Coating Association's (ACA) conference, and in *Proceedings of the ACA's Coating Regulations and Analytical Methods Conference*, Pittsburgh, PA, May 14-15, 2013. [[PDF](#)] [[PPT](#)]
- New, Joshua R. (2013). "Autotune Building Energy Models." *DOE Building Technology Office (BTO) Peer Review*, Washington DC, April 2, 2013. [[BTO](#)] [[PPT](#)]

102. Garret, Aaron and New, Joshua R. (2013). "Trinity Test: Effectiveness of Automatic Tuning for Commercial Building Models." ORNL internal report ORNL/TM-2013/130, March 7, 2013, 24 pages.

2012

103. Castello, Charles C. and New, Joshua R. (2012). "Autonomous Correction of Sensor Data Applied to Building Technologies Utilizing Statistical Processing Methods." In *Proceedings of the 2nd Energy Informatics Conference*, Atlanta, GA, Oct. 6, 2012. [[AIS](#)] [[PDF](#)] [[PPT](#)]
104. Jones, Chad, New, Joshua R., Sanyal, Jibonananda, and Ma, Kwan-Liu (2012). "Visual Analytics for Roof Savings Calculator Ensembles." In *Proceedings of the 2nd Energy Informatics Conference*, Atlanta, GA, Oct. 6, 2012. [[AIS](#)] [[PDF](#)] [[PPT](#)]
105. Edwards, Richard E., New, Joshua R., and Parker, Lynne E. (2012). "MLSuite - FY2012 Final Report." ORNL internal report ORNL/TM-2013/385, October 2012, 68 pages.
106. Edwards, Richard E., Zhang, Hao, Parker, Lynne E. and New, Joshua R. (2012). "Approximate 1-fold Cross-Validation with Least Squares SVM and Kernel Ridge Regression." ORNL internal report ORNL/TM-2012/419, August 2012, 9 pages.
107. Al-Wadei, Yusof H., New, Joshua R., and Sanyal, Jibonananda (2012). "Interactive Web Design through Survey and Adoption of Modern Web-Technologies." Presented as part of the Science Undergraduate Laboratory Internships (SULI) program, August 2012. [[PDF](#)] [[Poster](#)]
108. New, Joshua R., Sanyal, Jibonananda, Bhandari, Mahabir S., Shrestha, Som S. (2012). "Autotune E+ Building Energy Models." In *Proceedings of the 5th National SimBuild of IBPSA-USA*, International Building Performance Simulation Association (IBPSA), August 1-3, 2012. [[PDF](#)] [[PPT](#)]
109. Sanyal, Jibonananda, Al-Wadei, Yusof H., Bhandari, Mahabir S., Shrestha, Som S., Karpay, Buzz, Garret, Aaron L., Edwards, Richard E., Parker, Lynne E., and New, Joshua R. (2012). "Autotune: Building Energy Model Calibration using EnergyPlus, Machine Learning, and Supercomputing." In *Proceedings of the 5th National SimBuild of IBPSA-USA*, International Building Performance Simulation Association (IBPSA), August 1-3, 2012. [[Poster](#)]
110. Boudreaux, Philip R., Gehl, Anthony C., New, Joshua R., and Christian, Jeffrey E. (2012). "Campbell Creek Energy Efficient Homes Project: Summer 2011 Performance Report." ORNL internal report ORNL/TM-2012/51, July 2012, 49 pages.
111. Omitaomu, Olufemi A., Bhaduri, Budhendra L., Kodysh, Jeffrey B., Kramer, Ian S., Lapsa, Melissa V., New, Joshua R., Matheson, Michael A., and Shankar, Mallikarjun (2011). "LDRD

Report: Citizen Engagement for Energy Efficient Communities (CoNNECT)." ORNL internal report LDRD LOIS #05971, July 2012.

112. Bhandari, Mahabir S., Shrestha, Som S., and New, Joshua R. (2012). "Evaluation of Weather Data for Building Energy Simulations." In *Journal of Energy and Buildings*, volume 49, issue 0, pp. 109-118, June 2012. [[PDF](#)]
113. Edwards, Richard E., New, Joshua R., and Parker, Lynne E. (2012). "Predicting Future Hourly Residential Electrical Consumption: A Machine Learning Case Study." In *Journal of Energy and Buildings*, volume 49, issue 0, pp. 591-603, June 2012. [[PDF](#)]
114. Malhotra, Mini, MacDonald, Michael, Accawi, Gina K., New, Joshua R., and Im, Piljae (2012). "National Energy Audit Tool for Multifamily Buildings - Development Plan." ORNL internal report ORNL/TM-2010/328, March 2012, 88 pages.
115. Garrett, Aaron and New, Joshua R. (2012). "An Evolutionary Approach to Parameter Tuning of Building Models (Experiments 1-17)." ORNL internal report ORNL/TM-2012/418, April 2012, 68 pages.

2011

116. Edwards, Richard E., New, Joshua R., and Parker, Lynne E. (2011). "Sensor-based Building Energy Modeling." ORNL internal report ORNL/TM-2011/328, September 2011, 79 pages.
117. Cheng, Mengdawn, Miller, William (Bill), New, Joshua R., and Berdahl, Paul (2011). "Understanding the Long-Term Effects of Environmental Exposure on Roof Reflectance in California." In *Journal of Construction and Building Materials*, volume 26, issue 1, pp. 516-26, August 2011. [[PDF](#)]
118. New, Joshua R., Jones, Chad, Miller, William A., Desjarlais, Andre, Huang, Yu Joe, and Erdem, Ender (2011). "Poster: Roof Savings Calculator." In *Proceedings of the International Conference on Advances in Cool Roof Research*, Berkeley, CA, July 2011. [[PDF](#)]
119. New, Joshua R., Miller, William (Bill), Desjarlais, A., Huang, Yu Joe, and Erdem, E. (2011). "Development of a Roof Savings Calculator." In *Proceedings of the RCI 26th International Convention and Trade Show*, Reno, NV, April 2011. [[PDF](#)] [[PPT](#)]

2010

120. Boudreaux, Philip R., Gehl, Anthony C., Dockery, R., New, Joshua R., and Christian, Jeffrey E. (2010). "Tennessee Valley Authority's Campbell Creek Energy Efficient Homes Project: 2010 First Year Performance Report July 1, 2009 - August 31, 2010." ORNL internal report ORNL/TM-2010/206, November 2010, 165 pages. [[PDF](#)]
121. Miller, William A., New, Joshua R., Desjarlais, Andre O., Huang, Yu (Joe), Erdem, Ender, and Levinson, Ronnen (2010). "Task 2.5.4 - Development of an Energy Savings Calculator." California Energy Commissions (CEC) PIER Project, ORNL internal report ORNL/TM-2010/111, March 2010, 32 pages.
122. Miller, William A., Cheng, Mengdawn, New, Joshua R., Levinson, Ronnen, Akbari, Hashem, and Berdahl, Paul (2010). "Task 2.5.5 - Natural Exposure Testing in California." California Energy Commissions (CEC) PIER Project, ORNL internal report ORNL/TM-2010/112, March 2010, 56 pages.

2005-2009 (PhD)

123. New, Joshua R. (2009). **PhD thesis:** "Visual Analytics for Relationships in Scientific Data" In *Archives of the UTK Library*, Knoxville, TN. [[PDF](#)] [[deliverables](#)]

124. New, Joshua R., Kendall, Wesley, Huang, Jian, and Chesler, Elissa (2008). "Dynamic Visualization of Co-expression in Systems Genetics Data" In *Journal of IEEE Transactions on Visualization and Computer Graphics (TVCG)*, volume 14, issue 5, pp. 1081-94, 2008. [[PDF](#)]
125. Jian Huang and Markus Glatter and Wesley Kendall and Brandon Langley and Joshua New and Roberto Sisneros and Forrest Hoffman and David Erickson (2008). "Time-Varying Multivariate Visualization for Understanding the Climate Science of the Terrestrial Biosphere." In *Proceedings of the 13th Annual Community Climate System Model Workshop*, Breckenridge, Colorado, June 2008. [[PDF](#)]
126. New, Joshua R. (2008). "SeeGraph: A Visual Analytics System for Correlation Data." In *Proceedings of the 2nd annual Gaggle Workshop*, Institute for Systems Biology, Seattle, WA.
- New, Joshua R. (2007). "SeeShader: A System for General Purpose Computation on the GPU." Presented as part of a special edition of the UTK Computer Graphics Course, Knoxville, TN.
- New, Joshua R. (2006). "SeeBrain: A System for Comparative Visualization of Brain Nerve Fiber Tracts." Presented as the East Tennessee chapter of the Association for Computing Machinery (ACM), Knoxville, TN.
- New, Joshua R. (2006). "Fiber Renderer: A System for Visualizing Queries of DT-MRI tracts." Presented at the Vanderbilt University's Institute of Imaging Science, Nashville, TN.
- New, Joshua R. (2005). "SeeGraph: A System for Visualizing Weighted-Edge Graphs." Presented at the Oak Ridge National Laboratory, Oak Ridge, TN.

2001-2004 (MS)

127. New, Joshua R. (2004). **Master's Thesis:** "An Advanced User Interface for Pattern Recognition in Medical Imagery: Interactive Learning, Contextual Zooming, and Gesture Recognition." In *Archives of the JSU and MCIS Libraries*, Jacksonville, AL. [[PDF](#)] [[PPT](#)] [[deliverables](#)]
128. New, Joshua R., Hasanbelliu, E., and Aguilar, M. (2004). "Med-LIFE: A Diagnostic Aid for Medical Imagery." In *Proceedings of the International Conference on Mathematics and Engineering Techniques in Medicine and Biological Sciences*, Las Vegas, Nevada. [[PDF](#)]
129. New, Joshua R. (2004). "Heterogeneous ARTMAPs for Image Segmentation." In *Proceedings of the JSU Graduate Research Colloquium*, Jacksonville, AL. [[PDF](#)] [[PPT](#)]
130. New, Joshua R. (2004). "A Method for Temporal Hand Gesture Recognition." In *MCIS Technical Report*, Jacksonville, AL. [[PDF](#)] [[PPT](#)]
131. Aguilar, M., New, Joshua R., and Hasanbelliu, E. (2003). "Advances in the Use of Neurophysiologically-based Fusion for Visualization and Pattern Recognition of Medical Imagery." In *Proceedings of the 6th International Conf. on Information Fusion*, Cairns, Australia. [[PDF](#)] [[PPT](#)]
132. New, Joshua R. and Aguilar, M. (2003). "The Sword: A Role Playing Game for Demonstrating Computer Graphics Techniques." In *Proceedings of the JSU Graduate Research Symposium*, Jacksonville, AL. [[PPT](#)]
133. New, Joshua R. and Aguilar, M. (2003). "Pliable Display Technology: Contextual Zoom as a Learning System Interface." In *Proceedings of the JSU Graduate Research Symposium*, Jacksonville, AL. [[PPT](#)]
134. New, Joshua R., Hasanbelliu, E., and Aguilar, M. (2003). "Facilitating User Interaction with Complex Systems via Hand Gesture Recognition." In *Proceedings of the 2003 ACM Southeast Conference*, Savannah, GA. [[PDF](#)] [[PPT](#)]

135. New, Joshua R. (2002). "A Method for Hand Gesture Recognition." In *Proceedings of the ACM Mid-Southeast Fall Conference*, Gatlinburg, TN. [\[PDF\]](#) [\[PPT\]](#)
136. Aguilar, M. and New, Joshua R. (2002). "Fusion of Multi-Modality Volumetric Medical Imagery." In *Proceedings of the Fifth International Conference on Information Fusion*, Annapolis, MD. [\[PDF\]](#) [\[PPT\]](#)
137. New, Joshua R. and Hasanbelliu, E. (2002). "Med-LIFE: A System for Medical Imagery Exploration." In *Proceedings of the JSU Graduate Research Colloquium*, Jacksonville, AL. [\[PDF\]](#) [\[PPT\]](#)
- 1999**
138. New, Joshua R. (1999). "Sonoluminescence." In *Proceedings of the College of Arts and Sciences 3rd Annual Undergraduate Research Symposium*, Jacksonville State University, Jacksonville, AL.

Memberships

- ASHRAE (Amer. Society of Heating, Refrigeration, and A/C Engineers) 2010-Present
- IEEE (Institute of Electrical and Electronics Engineers) 2004-Present
- AEE (Association of Energy Engineers) 2017-Present
- PMI (Project Management Institute) 2017-Present
- ACM (Association for Computing Machinery) and UTK local chapter 2004-2012
- JSU Math Club and MAA (Mathematical Association of America) 1997-2002
- President of the JSU Math Club 1998-2001
- JSU Computer Science Club 1997-2003
- AITP (Association of Information Technology Professionals) 1997-2002
- AIP (American Institute of Physicists) 1998-2002
- Phi Eta Sigma (Freshman Honor Society); Omicron Delta Kappa (Senior Honor Society); Mu Alpha Theta (Math Honor Society); National Honor Society; and other honor societies.

Relevant Courses

The University of Tennessee, Knoxville:

Recent Visualization Literature	Fall 2008
Recent Visualization Literature	Spring 2008
Recent Visualization Literature	Fall 2007
Microarray Technology and Database Applications	Fall 2007
Journal Club on Modern Genetics	Fall 2007
Interactive Computational Simulation	Fall 2006
Recent Visualization Literature	Fall 2006
Independent Study – Large Data Visualization	Spring 2006
Machine Learning	Spring 2006
Algorithm Complexity	Spring 2006
Independent Study – Feature Tracking	Fall 2005
Graphical User Interface Design	Fall 2005
Image Analysis	Spring 2005
Operating and Software Systems	Spring 2005
Independent Study – Diffusion Tensor MRI	Fall 2004
Scripts and Utilities	Fall 2004
Computer Systems Organization	Fall 2004
Artificial Intelligence	Fall 2004

Jacksonville State University:

Computer Special Topics - Gesture Recognition	Fall 2003
Modern Analysis	Fall 2003
Computer Special Topics - Contextual Zoom	Spring 2003

Computer Graphics	Spring 2003
Software Architectures and Methodologies	Fall 2002
Software Cost Estimation and Metrics	Spring 2002
Fundamentals of Human-Computer Interaction	Spring 2002
Applied Software Engineering 2	Spring 2002
Applied Software Engineering	Fall 2001
Applied Artificial Intelligence	Fall 2001
Database & DBMS	Fall 2001
Programming Languages	Spring 2001
Electrodynamics	Spring 2001
Physics Special Topics - General Relativity	Spring 2001
Computer Networking	Fall 2000
Artificial Intelligence	Fall 2000
Survey of Geometries	Fall 2000
Algorithm Design & Analysis	Fall 2000
Introduction to Abstract Algebra	Fall 2000
Modern Physics	Fall 2000
Database and DBMS	Spring 2000
Mathematical Statistics	Spring 2000
Differential Equations	Spring 2000
Astronomy	Spring 2000
Operating Systems	Fall 1999
Mathematical Statistics I	Fall 1999
Numerical Analysis	Fall 1999
Advanced Calculus	Fall 1999
Elements of Linear Algebra	Spring 1999
Data Structures	Spring 1999
Discrete Structures	Spring 1999
Digital Logic and Architecture	Spring 1999
Physics for Scientists and Engineers	Fall 1998 - Spring 1999
Advanced Mathematics and proofs	Spring 1998
Calculus I – IV	Fall 1997 - Fall 1998

Community Service

Church audio-visual director	2005-Present
IEEE VisWeek Conference Student Volunteer Chair	2008-2010
IEEE Visualization Conference Student Volunteer	2005-2007
Assistant, Alabama Statewide Mathematics Tournament, Jacksonville State University	2002
Event Judge, Science Olympiad, Jacksonville State University	1999
Assistant, Alabama Statewide Mathematics Tournament	1998
Church technical lead - puppeteer, technical trainer, sound and light conductor	1990-2003

References provided upon request.