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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

RESEARCH AND DEVELOPMENT STAFF
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). Responsible for sponsor relations, securing funding, multi-disciplinary team communication and development, 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.

- Funding – led a 5-year average of 9.4 funded projects per year (63.4% success rate), personal budget authority over $1.3 million per year, and total award amount over $4.8 million per year

- Deliverables – successfully led ORNL teams to complete 3-year average of 44 deliverables per year, 100% on-time and on-budget when no critical needs from non-ORNL performers.

- Publications – 5-year average co-authorship of 13.8 accepted publications per year with 93% acceptance rate; h-index 9; i10-index 8

- Achievements – development of the world's #1:
  - fastest building simulator for 524,288 annual building simulations using 131,072 processors and writing 45TB of data to disk in 68 minutes on Titan
  - largest building simulation dataset totaling over 200TB; used for big data mining

- o fastest building creator on a (4-core) laptop with 155,793 buildings requiring 35GB written to disk in 2.6 minutes
- o calibration algorithm for changing simulation inputs such that output matches measured data: measured in terms of CV(RMSE) and NMBE output error metrics used by ASHRAE Guideline 14 as well as the new, co-developed input-side error

- Primary contributor to the 2016 R&D 100 Award winning Roof Savings Calculator (RSC); a web-based, industry-consensus energy audit tool for residential and commercial buildings using DOE-2.1E simulations integrated with AtticSim for modeling advanced roof and attic systems averaging 64 visits/day since April 2010.

- Managing the development of an integrated suite of open source, proprietary, custom, and commercial machine learning tools (MLsuite) for big data mining 200+ TB of building simulation data using High Performance Computing and lab computers simultaneously.

- Operational R&D systems for ORNL's Flexible Research Platforms including robotically-emulated occupancy, data acquisition systems, server hardware, sensor analytics, wiki, sensor analytics, dashboards, websites, and web services.

- Developing visual analytics tools to assist information gathering and knowledge discovery through demonstration home dashboards, linked parallel coordinate plots, and data mining for millions of simulations and capable of running on 35+ megapixel powerwall displays.

- Responsible for access, maintenance, backup, and cybersecurity compliance of BTRIC's server room, software systems, and visualization wall.

JOINT FACULTY, ELEC. ENG. & COMPUTER SCIENCE (EECS) DEPARTMENT
The University of Tennessee   2012-Present   Knoxville, TN
- Serve as research staff participating in several departmental institutes and research proposals.

FOUNDER & CEO
Tunation, LLC   2015-Present   Knoxville, TN
- Startup company founder commercializing Autotune software developed by and licensed from Oak Ridge National Laboratory for the Department of Energy.

- Tunation enables customers to create an accurate virtual representation of a building with unequaled zero-touch quality and accuracy resulting in significant savings of modeling expenses, significantly reduced risks, financing of larger projects, and an expanded market for cost-effectively making America's buildings more energy efficient.

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
- 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)
- 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, Vice Chair (2017-), Secretary (2015-17), voting member (2014-)
- 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-); 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

2019

1. 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.

2. Garrison, Eric, New, Joshua R., and Adams, Mark (2019). "Accuracy of Crude, Urban-Scale Building Energy Models." To appear in *Proceedings of the ASHRAE Winter Conference* To appear in *Proceedings of the ASHRAE Winter Conference*, Atlanta, GA, Jan. 12-16, 2019.

3. 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.

2018

4. 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.

5. Adams, Mark and New, Joshua R. (2018). "EnergyPlus Performance Improvements via JSON Input Refactoring." 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.

6. 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.

7. 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.

8. 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.

9. 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.

10. 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]

11. 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]

12. 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]

13. 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]

14. 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]

15. 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

16. 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]

17. 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, Knoxvile, 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]

18. 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]

19. 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]

20. 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]

21. 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.

22. 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]

23. 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.

24. 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.

25. 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]

26. 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.

27. 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.

28. 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.

29. 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]

30. 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.

31. 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.

32. 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.

2016

33. 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.

34. 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]

35. 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.

36. 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]

37. 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]

38. 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]

39. 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]

40. 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]

41. 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.

42. 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]

43. 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.

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2005-2009 (PhD)

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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)

106. 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]

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1999

117. 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
- 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

IEEE VisWeek Conference Student Volunteer Chair	2008-2010
IEEE Visualization Conference Student Volunteer	2005-2007
Church audio-visual director	2005-Present
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.