

Mahabir S. Bhandari

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Dr. Mahabir Bhandari is an R&D Staff member in ORNL's Whole Building & Community Integration group. He has more than 20 years of experience in the field of building energy performance. He is a LEED™ Accredited Professional Building Design + Construction (BD+C) and National Fenestration Rating Council (NFRC) certified simulator and has actively participated in several LEED™ and sustainability projects and contributed significantly in building energy software product developments. In recent years, Dr. Bhandari's focus has been on module development for EnergyPlus, whole building energy simulation, manual and auto calibration, industrial energy data analysis for energy savings impact, building energy monitoring and performance analysis and the evaluation and integration of energy efficient technologies in buildings. He currently serves on the NFRC Board of Directors.

PROFESSIONAL HISTORY

Oak Ridge National Laboratory, Oak Ridge, TN : R&D Staff (2011- present)

- DOE's Commercial Building Integration demonstration and deployment programs support
- Analysis of key performance metrics for DOE's Combined Heat and Power (CHP) Technical Assistance Partnership (TAPs) activities
- Whole building and component energy simulation and calibration
- Manages - International collaborative projects including U.S.-India Center for Building Energy Research & Development (CBERD)

DesignBuilder Software USA/Carli Inc. : Technical Director (2009- 2011)

- Provide training and technical support for DesignBuilder Software, a comprehensive Graphical User Interface for EnergyPlus
- Provide technical assistance and guidance to software development team for developing software tools, EFEN

Carli Inc. : Senior Energy Analyst (2003- 2009)

- Develop software for modeling and simulating heat transfer and fluid flow in buildings to determine energy efficiency of buildings
- Whole building energy analysis, simulation for LEED submission

University of Massachusetts: Post-Doctoral Research Fellow (2000- 2003)

- Assisting in the development of heat transfer algorithms and software
- Coordinating students research, writing technical proposal and reports in the area of energy efficiency and building design

EDUCATION

- Ph.D., Indian Institute of Technology, Delhi, India, 1996
- M.Tech., Indian Institute of Technology, Delhi, India, 1992

PUBLICATIONS

- Bhandari, Mahabir S., S.S. Shrestha and J.R. New. "Survey and Analysis of Weather Data for Building Energy Simulations." Energy and Buildings 49, no. 0, 109-118, (2012).

- Yasin Khan, Jyotirmay Mathur, Mahabir Bhandari, Vivek Kumar¹ and Prateek Srivastava, Development of Heat Transfer Model for Ceiling Radiant Cooling Panel through Combined Experimental and Simulation, ASHRAE Winter Conference, Las Vegas, Jan 2017, ASHRAE Transaction Paper.
- Yasin Khan, Mahabir Bhandari, Jyotirmay Mathur, Energy Savings Potential of Radiant Cooling Systems in different climate zones of India, Submitted to ASHRAE Journal: Science and Technology for the Built Environment, accepted, March 2017.
- Prateek Sivastava, Yasin Khan, Jyotirmay Mathur, Mahabir Bhandari, Analysis of Radiant Cooling System Integrated with Cooling Tower for Composite Climatic Conditions, accepted in 15th International Conference of the International Building Performance Simulation Association–BS2017, California USA.
- Khan, Yasin, Vaibhav R. Khare, Jyotirmay Mathur, Mahabir S. Bhandari. "Performance Evaluation of Radiant Cooling System Integrated with Air System under Different Operational Strategies." Energy and Buildings. 2014.
- Jyotirmay Mathur, Mahabir Bhandari, and Yasin Khan, Energy Performance Assessment of Radiant Cooling System through Modelling and Calibration at Component Level, submitted at ASHRAE Winter Conference, Jan 23-27, 2016, Orlando, FL
- Vaibhav Khare, Anuj Mathur, Jyotirmay Mathur and Mahabir Bhandari, Development of Personalized Radiant Cooling System for an Office Room, 14th Conference of International Building Performance Simulation Association (BS15), Dec 7-9, 2015, Hyderabad, India.
- Anuj Sharma, Jyotirmay Mathur and Mahabir Bhandari, Performance Evaluation of Radiant Cooling System in Composite Climate, 14th Conference of International Building Performance Simulation Association (BS15), Dec 7-9, 2015, Hyderabad, India.
- 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.
- 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.
- Rai Khare, Vaibhav, Yasin Khan, Jyotirmay Mathur, and Mahabir Bhandari. "Radiant Cooling: A Case Study of Energy Savings and its Enhancement in an Office Building." ASim2014, IBPSA Asia Conference. Nagoya, Japan. November 2014.
- Mathur, Jyotirmay, Mahabir Bhandari, Yasin Khan, Vaibhav Rai Khare. "Radiant cooling system: A case study of assessment of energy savings in an office building." 3rd National Conference on Refrigeration and Air Conditioning (NCRAC-2013) IIT. Madras, Chennai. December 2013.
- Im, Piljae and M.S. Bhandari, "IS MONTHLY AND WHOLE BUILDING LEVEL CALIBRATION ENOUGH? : A Detailed Modeling and Calibration Study of an Ultra-Efficient Occupancy Simulated House". 2014, ASHRAE/IBPSA-USA Building Simulation Conference. Atlanta, GA, September 10-12, 2014
- Im, Piljae and M.S. Bhandari, "Use of Flexible Research Platforms (FRP) for BIM and Energy Modeling Research". 2012 ASHRAE Summer Meeting, San Antonio, Texas, USA, June 24, 2012.

- Curcija, D.C., M.S. Bhandari, M. Manteghi, B.V. Shah, "Component Modeling Methodology for Predicting Thermal Performance of Non-Residential Fenestration Systems." Building 2004.
- Carbary, Lawrence D., V. Hayez, A. Wolf and M. Bhandari, "Comparisons of Thermal Performance and Energy Consumption of Facades Used in Commercial Buildings." Proceedings of Glass Performance Days, Finland, 2009.
- Curcija, D.C., M.S. Bhandari, M. Manteghi, B.V. Shah, "Component Modeling Methodology for Predicting Thermal Performance of Non-Residential Fenestration Systems." Building 2004.
- Curcija, Dragan, A. Dariush, C. Huizenga, C. Kohler, R. Mitchell, M. Bhandari, "Analyzing Thermal Performance of Building Envelope Components using 2-D Heat Transfer Tool with Detailed Radiation Modeling." Building Simulation 2001, Brazil, 2001.
- Shrestha, Som, W. Miller, T. Stovall, A. Desjarlais, K. Childs, W. Porter, M. Bhandari and S. Coley, "Modeling PCH-Enhanced insulation system and benchmarking EnergyPlus against controlled filed data." Proceedings of Building Simulation, 2011.
- Bhandari, M.S., and N.K. Bansal, Solar heat gain factor and heat loss coefficients for Passive heating concepts, Solar Energy, Vol. 53, No. 2, pp. 199-208, 1994.
- Daniel Howett and Mahabir Bhandari (2015) "Wireless Pneumatic Thermostat Evaluation, Ronald Reagan Building and International Trade Center– Technical Report, GSA's Green Proving Ground project".
- 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.
- 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.
- 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.
- 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.