

AVIRUCH BHATIA

TERI School of Advanced Studies ◊ Vasant Kunj, New Delhi

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RESEARCH INTERESTS

Building Energy Simulation
AI/ML for Building Energy Analysis
Green Net Zero/Positive Energy Buildings

EDUCATION

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| International Institute of Information Technology, Hyderabad, India Ph.D. in IT in Building Science | <i>2019</i> |
| Malaviya National Institute of Technology, Jaipur, India M.Tech. in Energy Engineering Overall GPA: 9.09/10 (Gold Medalist) | <i>2009</i> |
| University of Rajasthan, Jaipur, India M.Phil. in Physics Overall : 71/100 | <i>2006</i> |
| University of Rajasthan, Jaipur, India M.Sc. in Physics Overall : 66/100 | <i>2004</i> |
| University of Rajasthan, Jaipur, India B.Sc. in Physics, Mathematics, and Computer Applications Overall : 71.1/100 | <i>2002</i> |

CERTIFICATION

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| Indian Green Building Council Accredited Professional Qualified | <i>June 2010</i> |
| GRIHA Trainer Qualified | <i>June 2010</i> |
| CSIR-UGC National Eligibility Test (NET) in Physical sciences Qualified for Lectureship Category | <i>June 2006</i> |

EXPERIENCE

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| TERI School of Advanced Studies, New Delhi <i>Assistant Professor and Coordinator for REEM Program</i> | 21 Feb 2019 - Present <i>New Delhi, India</i> |
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· Department of Sustainable Engineering.

Teaching at TERI SAS

- Building Energy and Green Buildings
- Applied Numerical Methods
- Fundamental of Thermal Engineering
- Small Hydro Systems
- Conventional Energy and Environmental Implications
- Optimization Techniques for Energy Management and Planning

- Fluid Mechanics
- Energy Labs - Heat Transfer and Solar Thermal
- Energy Simulation Lab - EnergyPlus and HOMER

Lawrence Berkeley National Laboratory

15 Aug 2016 - 14 Feb 2017

Building Energy Efficiency Higher Advanced Network (BHAVAN) Intern

Berkeley, USA

- Worked on development of Fault Detection and Diagnostics (FDD) techniques for HVAC systems to improve energy efficiency.

Spectral - An AECOM Company

06 July 2009 - 31 May 2012

Assistant Manager - Sustainability Group

Noida, UP, India

- Overseeing the timely execution of projects and deliverables. Report preparation. Effective project management. Interacting with clients. Performing energy analysis for LEED certification along with Indian projects for GRIHA and LEED India certification.

Major Projects

- Eco Commercial Building (Greater Noida: Net Zero Building, LEED for India NC (Platinum certified))
- Mall of India, Noida Largest mall in India by DLF (18 Lac Sqft), LEED for India CS (Gold certified)
- The LEELA Palace, New Delhi: Use of VAM for cooling, LEED for India NC (Platinum certified)
- Minerva Lokhandwala, Mumbai: 82 floor super retail skyscraper, LEED for India CS (Gold Pre certified)
- Infosys SDB 2, Trivandrum LEED for India NC (Platinum certified)
- ISB, Mohali LEED for India NC (Gold certified)

JOURNAL PUBLICATIONS ORCID.ORG/0000-0002-2236-4783

Singh Vijay, Jyotirmay Mathur and Aviruch Bhatia. 2022. A comprehensive review: Fault detection, diagnostics, prognostics, and fault modeling in HVAC systems. *International Journal of Refrigeration*.

Sai Abhilash Reddy, Aviruch Bhatia and Vishal Garg. 2019. Development of a Surrogate Model by Extracting Top Characteristic Feature Vectors for Building Energy Prediction. *Journal of Building Engineering*.

Bhatia Aviruch, Sai Abhilash Reddy, and Vishal Garg. 2019. An Approach to Calculate the Equivalent Solar Heat Gain Coefficient of Glass Windows with Fixed and Dynamic Shading in Tropical Climates. *Journal of Building Engineering*.

Garg, Vishal, Shikher Somal, Rathish Arumugam, and Aviruch Bhatia 2016. Development for Cool Roof Calculator for India. *Energy and Buildings*.

Garg, Vishal, Rathish Arumugam, V Vinayaka Ram, and Aviruch Bhatia. 2015. Optimizing Roof Insulation for Roofs with High Albedo Coating and Radiant Barriers in India. *Journal of Building Engineering*.

Garg, Vishal, Akshey Jawa, Jyotirmay Mathur, and Aviruch Bhatia. 2013. Development and Analysis of a Tool for Speed up of EnergyPlus through Parallelization. *Journal of Building Performance Simulation*.

Bhatia, Aviruch, Jyotirmay Mathur, and Vishal Garg. 2011. Calibrated Simulation for Estimating Energy Savings by the Use of Cool Roof in Five Indian Climatic Zones. *Journal of Renewable and Sustainable Energy* 3 (2): 023108.

Bhatia, Aviruch, Jyotirmay Mathur, Vishal Garg and Hashem Akbari 2010. Determination of Energy Saving of Cool Roof on an Office Building in Hyderabad , India Using Calibrated Simulation. Solar Energy Society of India.

CONFERENCE PUBLICATIONS

A. Raihan, K. Chattopadhyay, A. Bhatia, V. Garg, A. Hussain, Energy Analysis of Semi-transparent Building Integrated Photovoltaic Window in Hyderabad, India Using Automated Parametric Simulations, IOP Conf. Ser. Earth Environ. Sci. 1050(2022)

S. Basak, A. Bhatia, Application of Global Sensitivity Analysis to Building Performance Simulations for Screening Influential Input Parameters in a Humid Coastal Climate, in: Adv. Clean Energy Technol., 2021: pp. 10111024.

A. Bhatia, V. Garg, P. Haves, V. Pudi, Explainable Clustering Using Hyper-Rectangles for Building Energy Simulation Data, IOP Conf. Ser. Earth Environ. Sci. 238 (2019) 012068.

K. Nihar, A. Bhatia, V. Garg, Optimal Control of Operable Windows for Mixed Mode Building Simulation in EnergyPlus, IOP Conf. Ser. Earth Environ. Sci. 238 (2019) 012052.

N.V.S. Kumar, Vishal Garg, S. Dhaka, A. Bhatia, Impact of climate change on building heating energy consumption, in: Int. Symp. to Promot. Innov. Res. Energy Effic., 2017.

P. Haves, A. Bhatia, T.V.S. Nikhil, V. Garg, eDOT An Early Stage Design Decision Tool for Building Energy Efficiency, in: ACEEE Summer Study Energy Effic. Build., 2016.

Garg, V., T.V.S. Nikhil, H. Rallapalli, A. Bhatia, J. Subhash, and C. Kasireddy. 2015. Surrogate City Finder - Weather Data Tool. In 14th International Conference of IBPSA - Building Simulation 2015, BS 2015, Conference Proceedings.

V. Garg, A. Mittal, R. Patni, R. Arumugam, A. Bhatia, H. Philip, WinOpt An Early Stage Design Tool for Optimizing Window Parameters, in: 30th Int. PLEA Conf., Ahmedabad, 2014.

A. Bhatia, R. Reddy, V. Garg, Design of Fault Detection and Diagnostics Lab for HVAC System, in: 2nd Asia Conf. Int. Build. Perform. Simul. Assoc. Japan, Japan, 2014.

BOOK PUBLICATION

Vishal Garg, Jyotirmay Mathur, and Aviruch Bhatia. 2020. Building Energy Simulation: A Workbook Using DesignBuilderTM. CRC Press. <https://doi.org/10.1201/9780429354632>.

PATENT APPLIED

Title: Chiller Selection Optimization for Energy Efficiency

Date of filing: Jan 12, 2016, Application number: 201611001077

Names of Inventors: Venkata Sai Nikhil, Vishal Garg, Jyotirmay Mathur, and Aviruch Bhatia

PROFESSIONAL MEMBERSHIP

Member, International Building Performance Simulation Association - India Chapter

Member, Indian Society of Heating, Refrigerating and Air Conditioning Engineers

TECHNICAL STRENGTHS

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| Building Energy Simulation | eQUEST, EnergyPlus, DesignBuilder |
| CAD Tools | AutoCAD |
| Computer Languages | Python, R, Shell, L ^A T _E X |
| Optimization tool | GAMS |
| Databases | MySQL |

EXPERT TALKS/INVITED LECTURES DELIVERED

One-Day Online Training Program on Thermal Comfort in Affordable Housing organised by ASCI, Hyderabad (05 Aug 2022)

Webinar on Circular Economy Integration for Built Environment Education organised by ProSPER.NET (28 July 2022)

Guest Lecture on Building Energy Efficiency at Linnaeus University, Vaxjo, Sweden (May 2022)

Online Workshop on Building Sustainable Campus A UNEP LBGN Initiative (Dec 2021)

Panel Discussion on Sustainable Homes by Women Indian Chapter of Commerce and Industry (2021)

Workshop on Building Performance Simulation using DesignBuilder organised by SRM Institute of Science and Technology, Chennai (2021)

Energy Simulation of Buildings organised by Sri Balaji College of Engineering, Jaipur (2020)

HVAC and R for Energy Efficient Buildings organised by Chitkara University (2020)

Design and Analysis of Building Structure by using Extended Three-Dimensional Analysis of Building System (ETABS) by Poornima Institute of Engineering Technology (2020)

GHAR Rating organised by CPWD (2021)

Energy Modeling Course e-Quest Training organised by Global Institute of Technology, Jaipur (2020)

Building Energy and Daylight Analysis organised by TERI School of Advanced Studies, New Delhi (February 2019)

Energy Simulation for ECBC 2017 organised by IIIT, Hyderabad (February 2018)

Energy Simulation organised by ASCI, Hyderabad (Oct 2014)

Energy Simulation of Buildings for LEED and ECBC organised by IIIT, Hyderabad (July 2013)

Workshop Energy Simulation organised by ISHRAE, Mumbai (Dec 2013)