

DR. SUNIL KUMAR

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Google Scholars: <https://scholar.google.com/citations?user=fcJWLUQAAAAJ&hl=en>

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52, Chander Lane, Kaimari Road,
Hisar 125001, Haryana, India

PROFILE SUMMARY

Lead with eleven years of experience in research & development, consultancy, and academia in the allied subjects of mechanical engineering. Extensive experience in handling government research and consultancy projects with knowledge dissemination through research training and publications.

EDUCATION

Ph. D. (Doctor of Philosophy) in Energy and Environment

Dec 2021

Malaviya National Institute of Technology (MNIT), Jaipur, Rajasthan, India

Thesis: *Quantification of Occupant's Adaptive Actions for Improving the Indoor Environmental Quality in Buildings.*

M. Tech. (Master of Technology) in Mechanical Engineering

Jun 2014

Guru Jambheshwar University of Science and Technology (GJUS&T), Hisar, Haryana, India

Thesis: *Analysis of Ginger Drying Inside a Forced Convection Indirect Solar Dryer: An Experimental Study*

CGPA: 7.3 out of 10

B. E. (Bachelor of Engineering) in Mechanical Engineering

Jun 2010

Maharshi Dayanand University, Rohtak, Haryana, India

Percentage marks: 75.18% (Degree awarded with distinction)

RESEARCH FIELDS & ACTIVITIES

Human-centric adaptive controls; Built environment; Building energy efficiency; Green buildings; Residential buildings energy use; Renewable energy systems;

RESEARCH EXPERIENCE (6.7 Years.....)

Senior Research Fellow

Jan 2018-till date

Centre for Energy and Environment, Malaviya National Institute of Technology, Jaipur, India

Project: *Residential Building Energy Demand Reduction in India*

Funding Agency: *Department of Science and Technology (Government of India) and Engineering & Physical Sciences Research Council (United Kingdom)*

Job description: This job profiles deals in the following key points:

- Review of existing data and development of literature based on-line repository on thermal comfort and energy usage in Indian dwellings.
- Designing of field study, installation of measuring devices and analysis of residential thermal comfort and energy load profiles using primary data.
- Development of residential archetypes and reference models using hierarchical and non-hierarchical techniques.
- Preparation of research proposals, reports and scientific publications.
- Organization of stakeholder and project meetings.

Research Associate**Nov 2017-Jan 2018**

Centre for Energy and Environment, Malaviya National Institute of Technology, Jaipur, India

Project: *Indoor Environmental Quality Standard Implementation Methodology*

Funding Agency: *Indian Society of Heating, Refrigerating and Air Conditioning Engineers*

Job description: This job profiles deals in the following key points:

- Demonstration of implementation methodology for India's first IEQ standard in actual buildings.
- Improving efficacy of the standard based on the experience gained through field evidences.
- Designing of field study and survey comprising both qualitative and quantitative assessments.
- Data compilation and detailed analysis of the field data.
- Preparation of research proposals, reports and scientific publications.

Project Engineer**Jun 2016-Jun 2017**

Centre for Energy and Environment, Malaviya National Institute of Technology, Jaipur, India

Project: *Centre for Building Energy Research and Development*

Funding Agency: *India-United States Partnership to Advance Clean Energy*

Job description: This job profiles deals in the following key points:

- Operation and maintenance of the Scheffler dish for steam cooking applications.
- Data refinement and analytics for improving the ISHRAE weather data.
- Preparation of research proposals, reports and scientific publications.

Senior Research Fellow**Dec 2014-May 2016**

Thermochemical Conversion Division, SSS-National Institute of Bio-energy, Kapurthala, India

Project: *National Bioenergy Promotion Fellowship*

Funding Agency: *Ministry of New and Renewable Energy, Government of India*

Job description: This job profiles deals in the following key points:

- Operation and maintenance of downdraft biomass gasification unit.
- Development of course modules for technicians in bio-energy technologies.
- Organizing training programs, conferences and research advisory meetings.
- Preparation of research proposals, reports and scientific publications.

TEACHING EXPERIENCE (1.6 Years)

Teaching Associate**Sep 2011-May 2012**

Mechanical Engineering Department, Guru Jambheshwar University of Science & Technology, Hisar, India

Subjects taught: Refrigeration and air-conditioning, thermodynamics, energy conversion

Lecturer**Aug 2010-May 2011**

Mechanical Engineering Department, Kalpana Chawla Institute of Engineering & Technology, Hisar, India

Subjects taught: Refrigeration and air-conditioning and thermodynamics

CONSULTANCY EXPERIENCE (2.8 Years)

Technical Course Developer**May 2018-Dec 2018**

Environmental Design Solutions, New Delhi, India

Job description: Development of e-learning academic courses on renewable energy technologies for graduate students. Two courses (A Primer to Solar Power and Renewable Energy) are developed.

Managed Network Expert**Sep 2012-Dec 2014**

Chegg India Private Limited, Visakhapatnam, India

Job description: To provide educational guidance and assistance to students of mechanical engineering by delivering them the relevant academic solutions and courses of their interests.

COMPUTER PROFICIENCY

Computer Basics; Microsoft Word/Excel/Powerpoint; Design tool - AutoCAD (Basic); Statistical tool - SPSS (Basic), Simulation tool - DesignBuilder (Basic) and eQUEST (Basic).

AWARDS/ACHIEVEMENTS/RECOGNITIONS

- Designated as LEED Green Associate by Green Business Certification Incorporated under the United States Green Building Council, 2021.
- Awarded the prestigious BHAVAN Fellowship 2020 for carrying out research at the University of Texas at Austin, USA (Funded by Indo-U.S. Science and Technology Forum and DST, Govt. of India).
- Joined the Indo-German Research and Academic Program at the Technical University of Applied Sciences, Germany in 2019 (Funded by German Academic Exchange Service).
- Received recognition for authoring the most cited research paper published in the Renewable and Sustainable Energy Reviews Journal of Elsevier during 2017-18.
- Received outstanding reviewer recognitions by reputed journals of Elsevier such as Renewable Energy Focus, Solar Energy, and Energy Conversion & Management in 2018.
- Awarded National Bioenergy Promotion Fellowship by the Ministry of New and Renewable Energy, Government of India at SSS-National Institute of Bioenergy, Kapurthala during 2014-16.
- Conferred with Silver Medal for outstanding academic accomplishments during Bachelor of Engineering in Mechanical Engineering in 2010.
- Meritorious award for securing distinction position in Secondary School Examinations conducted by the Board of School Education Haryana in 2004.
- Ranked 1 in Bhartiya Sanskriti Gyan Pariksha conducted by Gayatri Parivar (Haridwar) in 2004.
- Ranked 2 in Interschool Competition Exam conducted by Ideal Shiksha Samiti (Hisar) in 2002.

CONFERENCES/WORKSHOPS/TRAINING/COURSES ATTENDED

- One day industry and academia amalgamation named 2nd PAN India Research Network Meet jointly organized by National Institute of Wind Energy, Chennai, and CEE, MNIT Jaipur (06th Jan 2020).
- One day Industry-Academia Conclave on Energy Storage organized by Department of Science and Technology, Govt. of India at MNIT Jaipur (30th Nov 2019).
- Two days regional workshop on Energy Efficiency in Residential Buildings organized by Bureau of Energy Efficiency, Ministry of Power in association with RRECL at Jaipur (05-06th Nov 2019).
- One-week academic workshop on 'Energy Storage: The Future of Energy' under the AICTE Training and Learning (ATAL) scheme organized by MNIT, Jaipur, India (11-15th Mar 2019).
- South Asia's Largest Exhibition on Refrigeration & Cold Chain, Air Conditioning, Ventilation, and Intelligent Buildings organized by Indian Society of Heating, Refrigerating, and Air Conditioning Engineers at BEC, Mumbai, India (28th Feb to 2nd Mar 2019).
- One-week short-term course on Research Methods and Data Analysis Using SPSS organized by NIT Jalandhar, India (20-24th Jan 2019).
- E-course on Cities and Climate Change organized by UN Climate Change Learning Partnership 2019.
- Three days' workshop on Building Performance Evaluation (under the initiative of the UK-India Learn-BPE project) at Manipal University, Jaipur, India (11-13th Oct 2018).
- One DL program on ASHRAE 90.1 organized by ASHRAE Jaipur Section in association with ISHRAE Jaipur Chapter at Hotel Leisure Inn Grand Chanakya, Jaipur, India (23rd Aug 2018).
- One day SVAGRIHA Training Program organised by Green Rating for Integrated Habitat Assessment at MNIT, Jaipur, India (03rd Aug 2018).

- South Asia's Largest Exhibition on Refrigeration & Cold Chain, Air Conditioning, Ventilation, and Intelligent Buildings organized by Indian Society of Heating, Refrigerating, and Air Conditioning Engineers at BIEC, Bangalore, India (22-24th Feb 2018).
- One-week short-term course on Building Energy Simulation for ECBC 2017 organized by Indian Institute of Information Technology, Hyderabad, India (12-16th Feb 2018).
- One-day Thought-Provoking Workshop on Pertinent Issues Related to Air Quality in India, organized by Civil Engineering Department, MNIT, Jaipur, India (20th Jan 2018).
- One-week short-term course on Recent Advances in PCM-based Cooling Technology organized by IIT Bhubaneswar (India) under GIAN scheme (11-15th Dec 2017).
- Five days National Workshop on Performance Evaluation and O&M of Solar Thermal Systems organized by the National Institute of Solar Energy under MNRE, India (20-24th Apr 2017).
- One-day National Workshop on Concentrated Solar Technologies organized by Rajasthan Renewable Energy Corporation Limited at Bhiwadi, Rajasthan, India (2nd Mar 2017).
- International Conference on New and Renewable Energy Resources for Sustainable Future organized by SKIT, Jagatpura, Jaipur, India (2-4th Feb 2017).
- First and Second International Conference on Recent Advances on Bio-energy Research organized by SSS-NIBE, Kapurthala, India (14-17th Mar 2015 and 25-27th Feb 2016).
- International Conference & Exhibition on Cutting Edge Technological Challenges in Mechanical Engineering organized by NIET, Greater Noida, India (21-22nd Mar 2015).
- National Conference on Research Methodology and Advancement in Engineering and Science organized by Shanti Niketan College of Engineering, Hisar, India (24th Apr 2013).
- Three days National Workshop on Designing of Concentrated Solar Thermal & Solar Water Heating System organized by National Institute of Solar Energy, Gurgaon, India (08-10th Aug 2016).
- One-week National Training Program on Biofuel Production and Its Characterization organized by SSS-NIBE, India (30th Nov-04th Dec 2015).
- Three days National Training Program on Biofuel Production and Catalysis organized by SSS-NIBE, India (19-21st Jan 2015).

PUBLICATIONS (Citations: 1191...)

1. **Kumar S**, Mathur J and Mathur S. Quantifying occupant's adaptive actions for controlling indoor environment in naturally ventilated buildings under composite climate of India. *Journal of Building Engineering* 2021, Mar 12:102399 (**SCI**).
2. **Kumar S**, Jain N, Mathur J and Mathur S. Towards implementing an indoor environmental quality (IEQ) standard in buildings: a pilot study. *Building Services Engineering Research and Technology* 2020. DOI: 10.1177/0143624421997989 (**SCI**).
3. **Kumar S**, Tewari P, Kumar S, Mathur J and Mathur S. Impact assessment of air velocity on thermal comfort in composite climate of India. *Science and Technology for the Built Environment* 2020; 26:1301-1320 (**SCI**).
4. **Kumar S**, Mathur J, Garg V and Gupta R. Review of studies on thermal comfort in Indian residential buildings. *Science & Technology for Built Environment* 2020;26(6):727-48 (**SCI**).
5. **Kumar S**, Mathur J and Mathur S. Review of practices for human thermal comfort in buildings: Present and future perspectives. *International Journal of Ambient Energy* 2020. (**Scopus**).
6. **Kumar S**. Advances and challenges in solar-powered wastewater treatment technologies for sustainable development: an overview. *International Journal of Ambient Energy*, 2019. DOI: 10.1080/01430750.2019.1682038 (**Scopus**).
7. **Kumar S**, Sharma V, Mathur J. Energy and exergy analyses of various typical solar energy applications: a comprehensive review. *Renewable and Sustainable Energy Reviews* 2018; 82 (1):1576-1601 (**SCI**).

8. **Kumar S** et al. Global challenges in the sustainable development of biomass gasification: an overview. *Renewable and Sustainable Energy Reviews* 2017;80:23-43 (**SCI**).
9. **Kumar S** et al. Recent advances in the developments of biomass gasification technology: a comprehensive review. *Renewable and Sustainable Energy Reviews* 2017;72:363-84 (**SCI**).
10. Kumar M, **Kumar S**, Khatak P. Progress in solar dryers for drying various commodities. *Renewable and Sustainable Energy Reviews* 2016; 55:346-60 (**SCI**).
11. **Kumar S**, Kumar M. Analysis of ginger drying inside a natural convection indirect solar dryer: An experimental study. *Journal of Mechanical Engineering & Sciences* 2015; 9:1671-85 (**Scopus**).
12. **Kumar S**, Kumar M, Kaushal R, Kumar V. Investigation of indirect solar drying of ginger rhizomes (*Zingiber officinale*): a comparative study. *Journal of Engineering Science & Technology* 2017; 12(7):1956-71 (**Scopus**).
13. **Kumar S**, Bhutani V. Recent advances in the developments of pool boiling systems for food processing. *Journal of Biofuel and Bioenergy* 2016; 2(1):44-51.
14. Pal K, **Kumar S**, Gera P, Jha MK, Tyagi SK. An assessment to the biomass-based combustion systems. *Journal of Biofuel and Bioenergy* 2016; 2(2):102-21.
15. **Kumar S**, Kaushal R. Biomass pyrolysis for sustainable developments of bio-products. 1st International Conference on New Frontiers in Engineering, Science & Technology, New Delhi, India, Jan 8-12, 2018, 656-63.
16. **Kumar S**, Kumar M, Sahdev R. Towards natural convection solar drying of date palm fruits (*Phoenix dactylifera* L.): an experimental study. *Environmental Progress & Sustainable Energy* 2021.
17. Nayak BK, **Kumar S**, Mathur J, Chandra T, Garg V, Gupta R. A review of residential building archetypes and their applications to study building energy consumption. Submitted in *Journal of Architectural Science Review* 2021 (**SSCI**).

PROFESSIONAL ACTIVITIES

1. Membership of professional bodies:

- ASHRAE Technical Committee (T-TAC-TC01.01; T-TAC-TC02.01 and T-TAC-TRG4.IAQP)
- Chartered Institution of Building Services Engineers (Member ID: 058034)
- Indian Society of Heating, Refrigerating & Air Conditioning Engineers (Member ID: S00079280)
- Institution of Mechanical Engineers (Member ID: 80181805)
- International Association of Engineers (Member ID: 246519)
- Society of Building Science Educators (Member ID: 56179992)
- Teaching & Education Research Association (Member ID: M19101178)
- The Asia Society of Researchers (Senior Member ID: R219042002)

2. Workshops, Conferences, and Research meeting organized:

- Member, Organizing Committee for Industry-Academia Conclave on Energy Storage jointly organized by Department of Science and Technology (GOI) and MNIT, Jaipur (30th Nov 2019).
- Member, Organizing Committee for International Conference & Exhibition on Green Buildings organized by the Confederation of Indian Industry (CII) at Jaipur (04-07th Oct 2017).
- Member, Organizing Committee for First & Second International Conferences on Recent Advances on Bioenergy Research organized by SSS-National Institute of Bioenergy, Kapurthala (2015-16).
- Member, Organizing Committee for the First Research Advisory Committee Meeting organized by SSS-National Institute of Bioenergy, Kapurthala (22nd Jun 2015).

3. Research projects, proposals, and reports prepared:

- Prepared a report on Meta-study of Residential Energy and Comfort Datasets in India (Under Indo-UK Joint Research Project Funded by EPSRC, United Kingdom, and DST, Govt. of India).
- Prepared two chapters on biomass gasification and pyrolysis for a consultancy project on Training Module for Trainees in Bioenergy (Under National Bioenergy Fellowship Program, Govt. of India).

- Prepared a research project on Biomass Gasifier Testing, Certification, and R&D Centre at SSS-NIBE, Kapurthala (Under National Bioenergy Fellowship Program, Govt. of India).
- Prepared a proposal for training of participants from government bodies and ASEAN member States on Bioenergy Technology (Under National Bioenergy Fellowship Program, Govt. of India).

4. Working as the reviewer for the following journal titles:

- Applied Energy (SCI)
- Applied Water Science (UGC-CARE)
- Bentham Science Publishers
- Energy (SCIE)
- Energy Conversion and Management (SCIE)
- Energy Sources, Part A: Recovery, Utilization & Environmental Effects (SCI)
- Environmental Science and Pollution Research (SCI)
- Heliyon (SCIE)
- Ingeniería-e-Investigación (SCIE)
- International Energy Journal (Scopus)
- International Journal of Ambient Energy (Scopus)
- International Journal of Energy Research (SCIE)
- Journal of Building Construction & Planning Research
- Journal of Building Engineering (SCI)
- Journal of Engineering Science & Technology (Scopus)
- Journal of Thermal Analysis & Calorimetry (SCI)
- Lawrence Press
- Multidisciplinary Digital Publishing Institute (MDPI)
- Renewable & Sustainable Energy Reviews (SCI)
- Renewable Energy Focus (Scopus)
- Scientific Nature Reports (SCI)
- Science of the Total Environment (SCIE)
- Signals (CNKI)
- Sensors (SCIE)
- Solar Energy (SCIE)
- Sustainable Cities and Society (SCIE)

POSTER PRESENTATIONS

- **Kumar S**, Tyagi SK. Techno-economical study of a downdraft biomass gasifier for power generation. International Conference on Recent Advances on Bio-energy Research 2015, SSSNIRE, Punjab.
- **Kumar S**, Pal K, Tyagi SK. Biomass pyrolysis for sustainable developments of bio-products: an overview. International Conference on Recent Advances on Bio-energy Research 2016, SSSNIBE, Punjab.
- **Kumar S**, Tyagi SK. National CDM PoA on improved cookstoves in India. International Conference on Recent Advances on Bio-energy Research 2016, SSSNIBE, Punjab.
- **Kumar S**, Tyagi SK. Biomass cookstove testing and certification centre at SSS-NIBE. International Conference on Recent Advances on Bio-energy Research 2016, SSSNIBE, Punjab.

PERSONAL INFORMATION

- Date of Birth: 03rd Aug, 1989 (Bhiwani, Haryana, India)
- Linguistic Proficiency: Hindi, English, Haryanvi
- Special Interest/ Hobbies: Watching comedy shows

STUDENT GUIDED /SUPERVISED

Guided final year students of B. Tech. (Mechanical Engineering) for their major project entitled 'Field Assessment of IEQ in Residential Buildings during Winter Season of Jaipur'.

INTERNATIONAL VISITS

Technical University of Applied Science (Germany); Amsterdam (Netherland); Brussels (Belgium) & Paris (France)