# **Dr. Shah Alam**

# **Associate Professor**

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# **RESEARCH INTERESTS**

- Thermal Engineering
- Renewable Energy
- Solar Radiation Modeling
- ANN Modeling

# **EDUCATION**

- Ph. D. Solar Energy, (2006) Indian Institute of Technology Delhi
- M.Sc. Engineering, Thermal Engineering (1993), Aligarh Muslim University, Aligarh, India
- B.Sc. Engineering, Mechanical Engineering (1990),

#### SALIENT FEATURES OF PH.D. RESEARCH WORK

Solar Radiation data is required for designing and study the performances of solar energy based devices. The measurement of solar radiation is not possible at many stations because of high instruments cost, limited spatial coverage, and limited length of record. So there is need of theoretical models such that data of one climatic zone can be used to get information of other stations having similar conditions. In this thesis mainly three models, viz. parametric, artificial neural network and fuzzy logic has been included to estimate and compute solar radiation data. This study also includes the determination of hourly values of global and diffuse solar radiation from daily data and variation of atmospheric turbidity under varying climatic conditions. Wherever possible the models results were compared with measured data.

#### SOFTWARE SKILLS

Platforms: Windows XP

Applications: Mat Lab, MS-Office, AutoCAD

#### ACADEMIC EXPERIENCE

- Associate Professor, University Polytechnic, Jamia Millia Islamia, New Delhi, India (05 DEC 2008 – till date)
- Assistant Professor, Mechanical Engineering Department, IIUM Malaysia, (03 DEC 2007 – 03 DEC 2008)
- Lecturer (SG), University Polytechnic, Jamia Millia Islamia, New Delhi, India (01 AUG 2005 – 02 DEC 2007)
- Lecturer (SR), University Polytechnic, Jamia Millia Islamia, New Delhi, India (01 AUG 2000 – 31 JULY 2005)
- Lecturer, University Polytechnic, Jamia Millia Islamia, New Delhi, India (17 JULY 1995 – 31 JULY 2000)

#### **COURSES TAUGHT**

- General Mechanical Engineering
- Applied Thermodynamics
- Thermal Engineering II
- Fluid Mechanics & Fluid Machines
- Power Plant Engineering
- Renewable Energy Sources

#### COURSE TAUGHT IN IIUM MALAYSIA

- Engine Design
- > Dynamics
- Thermo-fluid Engineering

#### CONTRIBUTION TO ACADEMIC AND OTHER ACTIVITIES:

**University Level: Nodal Officer** Internal Quality Assurance cell Jamia Millia Islamia New Delhi, since 2000 till date

**Department Level: Coordinator** in Diploma in Mechanical Engineering Self-Finance University Polytechnic Jamia Millia Islamia New Delhi, since 2000 – till date

#### SHORT TERM COURSES/FACULTY DEVELOPMENT PROGRAMME

- 25th July 1995 to 31th July 1995, One week, Organized by Indian Institue of Technology Delhi held at Jamia Millia Islamia, New Delhi
- 11th Dec 1999 to 6th Jan 2000, Two week, Organized by Centre for Information Technology Jamia Millia Islamia, New Delhi
- ▶ 9 th May 7 th June 2000, Four week, Organized by UGC-ASC, Jamia Millia Islamia, New Delhi
- 16th Feb 2004 to 27th Feb 2004, Two week, By ISTE/AICTE held at University Polytechnic Faculty of Engineering and Technology Jamia Millia Islamia, New Delhi
- 20th Dec 2004 to 31th Dec 2004, Two week, By ISTE/AICTE held at University Polytechnic Faculty of Engineering and Technology Jamia Millia Islamia, New Delhi
- 16th Mar 2005 to 30th Mar 2005, Two week, By ISTE/AICTE held at University Polytechnic Faculty of Engineering and Technology Jamia Millia Islamia, New Delhi
- 6 th Jun 2005 to 10th Jun 2005, One week, conducted by Mechanical Engineering Department National Institute of Technical Teachers Training and Research Chandigarh
- 19th Mar 2007 to 23th Mar 2007, One week, By ISTE/AICTE held at University Polytechnic Faculty of Engineering and Technology Jamia Millia Islamia, New Delhi
- 26th Mar 2007 to 30th Mar 2007, One week, By ISTE/AICTE held at Department of Electronics & Communication Engineering, Aditya Institute of Technology, New Delhi-110070
- 19th -20th August 2008, Two week, organized by Centre for Professional Development (CPD), International Islamic University Malaysia
- 19<sup>th</sup> Feb 23th Feb 2018, Computational Methods in Fluid Mechanics and Heat Transfer, I I T Rookkee
- 27<sup>th</sup> May 28<sup>th</sup> May 2020, E-conent Development for MOOCS and online Teaching, UGC-HRDC Jamia Millia Islamia New Delhi
- 7<sup>th</sup> March 11<sup>th</sup> March 2022, Inculcating Universal Human Values in Technical Education, AICTE, New Delhi
- 3<sup>rd</sup> Jan 14<sup>th</sup> Jan 2022, Alternative Energy Sources for Sustainable Development, Department of Mechanical Engineering & Centre for Energy & Environment, Delhi Technological University Delhi 110042
- 19<sup>th</sup> Feb 28<sup>th</sup> Feb, 2024, NEP 2020 Orientation & Sensitization Programme, Jamia Millia Islamia New Delhi

#### PUBLICATIONS - INTERNATIONAL JOURNALS:

 Shah Alam, Abdul Qadeer, Mohammad Afazal, Determination of the optimum tiltangles for solar panels in Indian climates: A new approach, Computer & Electrical Engineering, 119, 2024, <u>https://doi.org/10.1016/j.compeleceng.2024.109638</u>

- A. Qadeer, S. Alam, H. Z. Jafri, Performance analysis of nanofluid on concentrating and non-concentrating collector's array, International Journal of Energy and Water Resources, 2024, <u>https://doi.org/10.1007/s42108-024-00330-y</u>
- 3. Abdul Qadeer, M. Emran Khan, Shah Alam, Tilt angle optimisation by Taylor's series expansion for maximum solar radiation in humid subtropical regions of India, International Journal of Ambient Energy, vol. 43, 1, 2022 <u>https://doi.org/10.1080/01430750.2022.2044380</u>
- Abdul Qadeer, Mohammad Emran Khan, Shah Alam, Estimation of Solar Radiation on Tilted Surface by Using Regression Analysis at Different Locations in India, Distributed Generation & Alternative Energy Journal, 35\_1, 1-18, 2021, <u>https://doi.org/10.13052/dgaej2156-3306.3511</u>
- 5. Hasan Shamim, Shadab Ahmad and Shah Alam, study of CFD approach to discretise first derivative of partial differential equation, Invertis Journal of Renewable Energy, 7(3), 142-146, 2017, <u>https://doi.org/10.5958/2454-7611.2017.00020.0</u>
- M. Khurshid Alam, Shah Alam, Life cycle analysis of multi-split Variable Refrigerant Flow (VRF) system : case study, Invertis Journal of Renewable Energy, volume 7(No. 3):165-170, <u>https://doi.org/10.5958/2454-7611.2017.00023.6</u>
- Shah Alam, Tahir Ali Khan, Mathematical Analysis of solar water pumping system for low income group flats, International Journal of Mechanical Engineering and Technology (IJMET), 0976-6340, Vol. 8, Issue 5, pp. 811-817, May 2017, <u>http://www.iaeme.com/IJMET/index.asp</u>
- 8. Shah Alam, Salman Tamseel, Analysis of solar-powered D.C. air conditioning system, International Journal of Scientific and Research Publications, 2250-3153, pp. 461-463, volume 6, issue 4, April 2016
- 9. Shah Alam, M S Falad, S A Quadri, Design of a solar plug-in hybrid vehicle, International Journal of Advance Engineering and Research Development (IJAERD), 2348-4470, volume 2, issue 7, 215-217, 2015
- K N Subrhmanyam, Shah Alam, Study of subcritical, super critical and ultra super critical thermal power plant, International Journal of Advance Engineering and Research Development (IJAERD), (IJAERD), 2348-4470, volume 2; issue 7,138-143, 2015
- N Tokas, S Alam, <u>Energy audit of gas based combined cycle power plant and analysis</u> for energy efficiency improvements, Invertis Journal of Renewable Energy 6 (4), 186-192

- 12. Madhulika Singh, Shah Alam, CFD approach to design and optimization of air, flue gas ducting system, Int. J. of advance Engineering and Research Development, 2348-4470. volume 2, issue 5, 346-1351, 2015
- 13. Shah Alam, S M Mahmood, Study of side view mirrors design on the fuel consumption of a car, Global Sci-Tech, 0975-9638, vol 6; 4; 2014, 224-227
- 14. Shah Alam, A case study to fulfil the requirement of low income group (LIG) house by installing PV panel, Int J of Scientific Research, 2277-8179, volume 1, issue 4, 44-45, 2012
- Shah Alam, S C Kaushik, S N Garg, Assessment of the diffuse solar energy under general sky condition using artificial neural network, Int. J. Applied Energy, 0306-2619. 86, 4, 554-564, 2009, <u>https://doi.org/10.1016/j.apenergy.2008.09.004</u>
- 16. Shah Alam, Computation of monthly mean hourly global solar radiation from daily totals, Int. J. Energy and Environment, 1563-1362, volume 6, 10-17,2007
- Shah Alam, S C Kaushik, S N Garg, Computation of beam solar radiation at normal incidence using artificial neural network, Int. J. Renewable Energy, 0960-148, volume 31, 10, 1483-1491, 2006, https://doi.org/10.1016/j.renene.2005.07.010
- Shah Alam, Prediction of direct and global solar irradiance using broadband models: Validation of REST model, Int. J. Renewable Energy, 0960-148, volume 31, 8, 1253-1263, 2006, https://doi.org/10.1016/j.renene.2005.06.009

#### PUBLICATIONS - NATIONAL/INTERNATIONAL SEMINOR:

- An empirical correlation for estimating hourly global radiation from daily global values for Indian regions, pp 179-185, Jan 23-24, 2004, Int. Conference on Energy & Environment Strategies for sustainable for sustainable development (ICEE-SSD), Department of Mech Engg F/O Engg & Tech JMI New Delhi
- Thermal performance of grooved configuration solar air Heater, pp 394-399, September 16-17, 2006, National conf. on Advances in Heat Transfer and Fluid Dynamics, Dept of Mechanical Engg, A M U Aligarh
- 3. A Proposed Model for Utilizing Exhaust Heat to run Automobile Air-conditioner, E-011 (P), November 21-23, 2006, The 2<sup>nd</sup> Joint International Conference on Sustainable Energy and Environment (SEE 2006), at Bangkok Thailand
- Thermal Performance of V-grooved double pass solar air heater, pp 56-59, February 7-9, 2007, 3<sup>rd</sup> International Conference on Solar Radiation and Day Lighting, (Solaris 2007), I.I.T. Delhi (India)
- Design and development of Noryl solar air heater, pp187-190, December 12-14, 2007, Int. Conf. (ICAER 2007), I I T Bombay
- 6. Simulation of monthly mean daily global solar radiation from cloud cover using Fuzzy inference system, pp 360-365, December 12-14, 2007, Int. Conf. (ICAER 2007), I I T Bombay
- Design of shell and tube type steam condenser using MATLAB, pp 42-45, April 16, 2015, National Conference on advance in Mechanical Engineering, NCAME-15, AL-FALAH University, Faridabad

- 8. Comparative study of sub critical and super critical pulverized coal fired thermal power plant pp. 64-68, April 16, 2015, National Conference on advance in Mechanical Engineering, NCAME-15, AL-FALAH University, Faridabad
- 9. Energy audit of gas based combined cycle power plant and analysis for energy efficiency improvement, pp. 180-188, April 16, 2015, National Conference on advance in Mechanical Engineering, NCAME-15, AL-FALAH University, Faridabad
- Study of Solar photovoltaic (SPV) Powered Thermal comfort System, pp. 119-128, 2016, International Conference and Exhibition on Building Utilities 2016, Mechanical Engineering Department, Jamia Millia Islamia New Delhi
- Utilization of sun power for pasteurising milk, Solaris 2019, February 7-9, 2019, International Conference on Renewable Energy and Sustainable Climate, Solaris-2019, Jamia Millia Islamia New Delhi
- 12. National Conference, NCORM 2020, 3 4 March 2020, National conference on Robotic & Mechatronics, Mechanical Engineering Department, Jamia Millia Islamia New Delhi

#### BOOK CHAPTER:

Abdul Qadeer, Shah Alam, Hasan Zakir Jafri, Wasim Akram, Solar Collector Tilt Angle Optimization for Maximum Solar Irradiation in Lucknow, Uttar Pradesh, India, In book: Advances in Heat Transfer and Fluid Dynamics Springer Nature Singapore, February 2024, DOI: <u>10.1007/978-981-99-7213-5\_32</u>

#### STUDY MATERIALS:

- 1. Fluid Mechanics Lab Manual (Modified version)-May 2018 https://www.academia.edu/36745307/Fluid\_Mechanics\_Lab\_Manual\_Modified\_version\_pdf
- 2. Heat Transfer Lab Manual JAN 2020 https://www.academia.edu/41876957/Heat\_Transfer\_Lab\_Manual\_Dr\_Shah\_Alam
- 3. Heat Engine Lab Manual JAN 2020 https://www.academia.edu/41519124/Heat\_Engine\_Lab\_Manual