DR. MUHAMMAD UZAIR

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EDUCATIONAL BACKGROUND:

- **Doctor of Philosophy (Ph.D.)**, Auckland University of Technology Auckland, New Zealand
  - Thesis topic: Wind induced heat losses from solar dish receiver systems
  - Experimental and numerical study on the solar parabolic dish system.
  - Building of experimental setup and scaled down testing on the prototype.
  - Used of ANSYS CFX to examine the problem numerically.
  - Used Statistical tools to find mathematical correlation.
- **Master of Engineering (M.E.),** Mechanical Engineering, N.E.D. University of Engineering & Technology, Karachi, Pakistan (CGPA 3.95)
- **Bachelor of Engineering (B.E.),** Mechanical Engineering, N.E.D. University of Engineering & Technology, Karachi, Pakistan

ACADEMIC EXPERIENCE:

1. **Associate Professor, Department of Mechanical Engineering (**https://med.neduet.edu.pk/)
   NED University of Engineering and Technology, Pakistan (Jan 2022 to Till date)

2. **Assistant Professor, Department of Mechanical Engineering (**https://med.neduet.edu.pk/)
   NED University of Engineering and Technology, Pakistan (Dec 2009 to Jan 2022)
   - Taught the following Courses to under graduate and post-graduate students:
     Thermodynamics, Fluid Mechanics, Heat Transfer, Renewable Energy, Solar Thermal Energy Systems,
   - Mentored and supervised final year students in their Final Year Project as a Project Advisor

3. **Lecturer, Department of Mechanical Engineering (**https://med.neduet.edu.pk/)
   NED University of Engineering and Technology, Pakistan (Nov 2006 to Dec 2009)
   - Taught the following Courses and Labs:
     Thermodynamics, Fluid Mechanics, Heat Transfer, Engineering Mechanics,
   - Worked as a Class advisor for the students of 1st Year of Engineering

4. **Teaching Assistant, Department of Design and Creative Technology**
   Auckland University of Technology (AUT), (July 2014 – July 2018)
   - Taught the following Courses and Labs:
     Thermodynamics, Fluid Mechanics, Heat Transfer
   - Trained the students on different computer aided design (CAD) software such as SOLIDWORKS and AUTOCAD
   - Laboratory tutor for a variety of mechanical engineering courses
   - Involved in assessment of student assignments, practical labs, projects and exams

GRANTS:

- Recipient of **NRPU by Higher Education of Pakistan** for a project of "Performance Optimization of Energy storage using Phase change materials" in 2022
- Recipient of **ASHRAE USA** grant of USD 5000/- for a project "small scale solar based vapor absorption cycle system" in 2021-22

- Recipient of **ASHRAE USA** grant of USD 5000/- for a project "Geo-thermal air-conditioning system " in 2020-21
- Recipient of Seed funding of PKR 0.89 million from **NED University of Engineering and Technology** in 2020-21
- Recipient of **ASHRAE USA** grant of USD 5000/- for a project "Small-Sized Parabolic Trough Collector System for Solar De-humidification Application: Design, Development, and Potential Assessment" in 2019-20

HONORS AND AWARDS:

- **Regional Lecturer of ASHRAE Regional At Large (Nov 2021- Oct 2022)**
- **Best Researcher Award** for year 2021 from NED University of Engineering and Technology
- **Best Researcher Award** for year 2020 from NED University of Engineering and Technology
- **Best Paper Award** for year 2018 from NED Alumni Association of Southern California (NEDAASC)
- **Best Paper Award** for year 2017 from NED Alumni Association of Southern California (NEDAASC)
- **Scholarship** to pursue PhD under Faculty development Program from NED University in 2014.
- **Grant** from Auckland University of Technology to participate in Asia-Pacific Solar Research Conference, Sydney, Australia in 2014
- **Grant** from Auckland University of Technology to participate in Asia-Pacific Solar Research Conference, Brisbane, Australia in 2015
- **Grant** from Auckland University of Technology to participate in Asia-Pacific Solar Research Conference, Canberra, Australia in 2016

PUBLICATIONS

JOURNAL PAPERS:

1. **Uzair, M.,** Naqvi, A.A., Akhtar, M., Zaidi, A. A., (2022). Statistical Approach to select the best suitable solar model for Global Radiation: Case study of Karachi, Pakistan. TECCIENCIA
2. **Uzair, M.,** Kazmi, S. U. H., Yousuf, M. U., Zaidi, A. A., (2022). Optimization of performance of PV panels and selection of the best site for solar park in Pakistan. Transactions of the Canadian Society for Mechanical Engineering
3. **Uzair, M.,** Rehman, N., Yousuf, M. U., (2022). Sensitivity Analysis of Capital and Energy Production Cost for Off-Grid Building Integrated Photovoltaic Systems. Renewable Energy, 186, pp195-206.
4. **Uzair, M.,** Siddiqui, M.A., Allauddin, U., (2022). Numerical study of Flow patterns and performance of a coupled cavity-dish system under different focal lengths. Transactions of the Canadian Society for Mechanical Engineering
5. **Muhammad Uzair**, Naveed Rehman, Mubashir Siddique, Syed Umair Hassan Kazm (2022). Improved Methodology for Determining Seasonal and Fixed Optimum Tilt Angles for Solar Collectors GMSARN International Journal
6. **Muhammad Uzair**, Ghulam Qadir Chaudhary, Naveed ur Rehman, Zeeshan Anwar, Syed Hamza Hassan, Hamza Siddiqui, Muhammad Shahbaz Hussain, (2022). Numerical investigation to determine the optimized solar parabolic cavity shape. GMSARN International Journal
7. **Uzair M**., Rehman, N., Asif, M., (2022). Effect of receiver misalignment on the intercept factor of parabolic trough collectors. Journal of Solar Energy Engineering, 144 (2), 024502-1
8. Rehman, N., **Uzair M**., (2022). Comparison of North-South and East-West facing solar collector pairs with and without reflectors. Journal of Solar Energy Engineering, 144, pp. 024501-11.
9. Shaikh, M., **Uzair, M.,** Allauddin, U., (2021). Effect of geometric configurations on charging time of latent heat storage of solar applications. Renewable Energy, 179, pp.262-271.

10. Naseer, M. N., Zaidi, A. A., Khan, H., Kumar, S., bin Owais, M. T., Jaafar, J., Nuor, S. S., Yasmin, A., Kingshuk D., Muhammad, A.,S.F. Wan Muhamad Hatta, **Uzair, M.** (2021). Mapping the field of microbial fuel cell: A quantitative literature review (1970–2020). Energy Reports, 7, 4126-4138.
11. **Uzair, M.,** & Rehman, N. U. (2021). Intercept Factor for a Beam-Down Parabolic Trough Collector. Journal of Solar Energy Engineering, 143(6), 061002.
12. Rehman, N.U., **Uzair, M**. & Asif, M. (2021) Optical Design of a Novel Polygonal Trough Collector for Solar Concentrating Photovoltaic Applications. Arabian Journal of Science and Engineering.
13. Allauddin, U., Salahuddin, S., & **Uzair, M.** (2021) Performance enhancement of an impinging jet system using different working fluids-A numerical study. Heat Transfer Research, 52, pp.17-30
14. Khan, S. Y., **Uzair, M**., Allaudin, U., & Masri, A. R. (2021). Experimental Investigation of Spray Characteristics of Electro-Hydro-Dynamic Atomization. GMSARN International Journal, 15, 250-258.
15. Rehman, N. U., & **Uzair, M.** (2021). Hybrid Ray Tracing Model and Particle Swarm Optimization for the Performance of an Internally Reflecting Solar Still with a Booster Reflector. Arabian Journal for Science and Engineering, 46(3), 2021-2032.
16. **Uzair, M**., Sohail, S. S., Shaikh, N. U., & Shan, A. (2020). Agricultural residue as an alternate energy source: A case study of Punjab province, Pakistan. Renewable Energy, 162, 2066-2074.
17. ur Rehman, N., & **Uzair, M.** (2020). Optimizing the inclined field for solar photovoltaic arrays. Renewable Energy, 153, 280-289.
18. ur Rehman, N., **Uzair, M.,** & Asif, M. (2020). Evaluating the solar flux distribution uniformity factor for parabolic trough collectors. Renewable Energy, 157, 888-896.
19. ur Rehman, N., Hijazi, M., & **Uzair, M.** (2020). Solar potential assessment of public bus routes for solar buses. Renewable Energy, 156, 193-200.
20. ur Rehman, N., **Uzair, M.,** & Allauddin, U. (2020). An optical-energy model for optimizing the geometrical layout of solar photovoltaic arrays in a constrained field. Renewable Energy, 149, 55-65.
21. **Uzair, M.,** Anderson, T., & Nates, R. (2020). Effect of Insertion of the Dish on the Behaviour of the Convective Heat Loss. Arabian Journal for Science and Engineering, 45(2), 989-1000.
22. Yousuf, M. U., Umair, M., & **Uzair, M**. (2020). Estimating the average diffuse solar radiation based on multiple parameters: A case study of arid climate zone of Pakistan. International Journal of Ambient Energy, 1-11.
23. ur Rehman, N., Siddiqui, M. A., & **Uzair, M**. (2019). Performance Modeling and Experimental Investigation of Parasitic Losses in a Flat-Panel Solar Thermoelectric Generator. Arabian Journal for Science and Engineering, 44(6), 5589-5602.
24. ur Rehman, N., **Uzair, M.,** Siddiqui, M. A., & Khamooshi, M. (2019). Regression models and sensitivity analysis for the thermal performance of solar flat-plate collectors. Arabian Journal for Science and Engineering, 44(2), 1119-1127.
25. **Uzair, M.,** Anderson, T. N., & Nates, R. J. (2018). Modeling of convective heat loss from a cavity receiver coupled to a dish concentrator. Solar Energy, 176, 496-505.
26. ur Rehman, N., Uzair, M., & Siddiqui, M. A. (2018). Optical analysis of a novel collector design for a solar concentrated thermoelectric generator. Solar Energy, 167, 116-124.
27. **Uzair, M.,** ur Rehman, N., & Raza, S. A. (2018). Probabilistic approach for estimating heat fluid exit temperature correlation in a linear parabolic trough solar collector. Journal of Mechanical Science and Technology, 32(1), 447-453.
28. Rehman, N. U., & **Uzair, M.** (2017). The proper interpretation of analytical sky view factors for isotropic diffuse solar irradiance on tilted planes. Journal of Renewable and Sustainable Energy, 9(5), 053702.
29. **Uzair, M.,** Anderson, T. N., & Nates, R. J. (2017). The impact of the parabolic dish concentrator on the wind induced heat loss from its receiver. Solar Energy, 151, 95-101.

CONFERENCE PAPERS:

1. Muhammad Wajahat Rasool Arain, Asad A. Zaidi, Muhammad Asif, **Muhammad Uzair**, 2022, "Design and fabrication of catalytic converter with new material", 11th International Mechanical Engineering Conference, Karachi, Pakistan
2. Muhammad Farhan, Asad A. Naqvi, **Muhammad Uzair**, 2022, "Increasing photovoltaic performance through temperature regulation by Soy wax as phase change material" 11th International Mechanical Engineering Conference, Karachi, Pakistan
3. Ghulam Qadar Chaudhary, Allah Ditta , Dr. Muzaffar Ali, **Muhammad Uzair**, Naveed Akram, Amar Gulnawaz, 2022, "Experimental study to analyse the effect of critical parameters on the performance of integrated solid desiccant using cross flow m-cycle" 11th International Mechanical Engineering Conference, Karachi, Pakistan
4. **Muhammad Uzair**, M. Zeeshan Anwar, Hamza Siddiqui, S. Hamza Hasan, M. Shahbaz Hussain, 2021, "Convective heat losses in a parabolic dish cavity receiver", 10th International Mechanical Engineering Conference, Karachi, Pakistan
5. **Uzair, M**., Anderson, T., and Nates, R., 2017, "Convective heat loss investigation from a couple parabolic dish receiver system", Proceeding of the 10th Australasian Natural Convection workshop (10ANCW), Auckland, New Zealand.
6. **Uzair, M.,** Anderson, T., and Nates, R., 2016, "Impact of dish structure on the convective heat loss from a parabolic dish solar cavity receiver", Proceedings of the Asia-Pacific Solar Research Conference, Canberra, Australia.
7. **Uzair, M.,** Anderson, T., Nates, R., and Etienne, J., 2015, "A validated simulation of wind flow around a parabolic dish", Proceedings of the Asia-Pacific Solar Research Conference, Brisbane, Australia.
8. **Uzair, M.,** Anderson, T., and Nates, R., 2014, "Wind Flow around a Parabolic Dish Solar Concentrator", Proceedings of the Asia-Pacific Solar Research Conference, Sydney, Australia.

PROJECTS PUBLISHED IN THE FORM OF BOOKS:

1. Project on "To design and study a Centrifugal Compressor for Gas Compression Station", Published by Lambert Academic Publishing's Foundation (ISBN: 978-3-659-18581-6)
2. Project on "Design of Solar Thermal powered Air Conditioner", Published by Lambert Academic Publishing's Foundation (ISBN: 978-3-659-11449-6)

CONFERENCE/WORKSHOPS/SEMINARS

CONFERENCES CONDUCTED

- **Conference Secretory** of 11th International Mechanical Engineering Conference (IMEC-22) under the theme "Sustainable Smart Advancements in Mechanical Engineering", held on 14th and 15th of January 2022
- **Conference Secretory** of 10th International Mechanical Engineering Conference (IMEC-2020-21) under the theme "Green Practices in Mechanical Engineering", held on 12th February 2021.
- **Focal Person** of 9th International Mechanical Engineering Conference (IMEC-2019) under the theme "Futuristic trends in Mechanical Engineering", held on 15th and 19th of March 2019.

WORKSHOPS CONDUCTED

- Conducted 3-Days workshop on ASHRAE Learning Course tilted "Fundamental of thermodynamics and Psychrometry" with collaboration of ASHRAE Pakistan Chapter in March 2011 as **Master Trainer**.
- Conducted 3-Days workshop on ASHRAE Learning Course tilted "Fundamental of Heating and Cooling Loads" with collaboration of ASHRAE Pakistan Chapter in April 2011 as **Master Trainer**.
- Participated a workshop as **Training of Trainer** on ""Design and Installation of Off- Grid and On- Grid Solar PV System", organized by REAP with collaboration of GIZ in November 2012.
- Participated a workshop as **Training of Trainer** on "ASHRAE's Variable Refrigerant Flow Systems Design and Applications" organized by Pakistan HVACR Society with collaboration with Global Training Center for Building Excellence – Dubai in 2019.

RESEARCH SUPERVISION:

- Supervising 04 PhD level students
- Supervising/supervised 13 Master level research projects

TECHNICAL SKILLS:

- CAD Packages — Pro-E (wildfire), AutoCad, Solid Works
- Simulation Packages: — MATLAB, ANSYS, FLUENT, EES, SolTrace, CFX

PROFESSIONAL TRAININGS

- Attended 17th World Wind Energy **Conference** and Expo 2018 in November 2018.
- Attended **Workshop** on "Statistical Testing", organized by Academic Consultant at AUT in 2016.
- Attended **Conference** on "Energy Conference - Roadmap for the Future!" organized by ASHRAE Pakistan Chapter in May 2012.
- Attended **Conference** on "Developing Energy Codes leading towards high performance buildings in Pakistan", organized by ASHRAE Pakistan Chapter in June 2011.
- Attended **Conference** on "5th International Conference on Alternative Energy & Power" in 2011.
- Attended **Training** on "Training of Dealer management System", in 2011.
- Attended a **course** on "Occupational Health and safety" in 2011.
- Attended **workshop** on ASHRAE Learning Course tilted "Fundamental of Thermodynamics and Psychrometrics" with collaboration of ASHRAE Pakistan Chapter in April 2007
- Attended **workshop** on ASHRAE Learning Course tilted "Fundamental of electrical systems and buildings energy use" with collaboration of ASHRAE Pakistan Chapter in April 2007
- Attended **workshop** on ASHRAE Learning Course tilted "Fundamental of HVAC control systems" with collaboration of ASHRAE Pakistan Chapter in April 2007
- Attended **workshop** on ASHRAE Learning Course tilted "Fundamental of ANSI/ASHRAE/IESNA Standard 90.1-2004" with collaboration of ASHRAE Pakistan Chapter in April 2007
- 40 days **Internship** at Karachi Electric Supply Corporation (KESC) in 2004.

PROFESSIONAL AFFILIATIONS AND MEMBERSHIPS

1. Member of Pakistan Engineering Council (PEC) (Life Time Member)
2. Member American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE)
3. Member American Society of Mechanical Engineers (ASME)
4. Member Pakistan HVACR Society (Life Time Member)
5. Member of Institution of Engineers Pakistan (IEP) (Life Time Member)

REFERENCES:

1. **DR. TIMOTHY ANDERSON**
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   AUCKLAND UNIVERSITY OF TECHNOLOGY
   EMAIL: timothy.anderson@aut.ac.nz
2. **DR. MUHAMMAD SHAKAIB**
   ASSOCIATE PROFESSOR
   NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY
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3. **DR. TARIQ JAMIL**
   ASSISTANT PROFESSOR
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