Personal Information

Name	**Abdur Rehman Mazhar**
Cell phone	+92 (0)301 5031221, +44 (0)7438 334498
E-mail	arehman1289@hotmail.com, arehman.mazhar@ceme.nust.edu.pk
Online profiles	https://www.linkedin.com/in/abdur-rehman-mazhar-4b948921/ https://www.researchgate.net/profile/Abdur_Rehman_Mazhar https://scholar.google.com.pk/citations?user=TdSuoqQAAAAJ&hl=en&oi=ao https://orcid.org/0000-0002-5446-6979

Professional Summary

I am a mechanical engineer and researcher, with an interest in analysing low carbon technologies. Having both industrial and research experience along with publications in renowned journals make my profile extremely versatile. Additionally, I consider myself as a hardworking, enthusiastic and reliable team player.

Education

October 2015 – October 2019	**PhD Engineering, Environment and Computing, Coventry University (CU)** A fully funded project by the EPSRC. It was based on the development of a non-industrial wastewater heat recovery unit using Phase Change Materials (PCMs) as a low carbon technology for passive buildings. The research work involved establishment of a numerical methodology to develop a functioning prototype to harness waste greywater heat in domestic buildings using detailed experimental and CFD simulations. The innovative concept and methodology can be expanded to commercial buildings for usage as decentralized heat sources in smart fourth generation district heating grids for the future.
October 2011 - April 2014	**MSc Power Engineering, Technische Universität München (TUM)** GPA: **2.0** as per the German grading system Courses concerned with the mechanical, electrical and civil aspects of the generation, transmission and distribution of energy, with emphasis on sustainable technologies.
August 2005 - July 2009	**BS Mechanical Engineering, GIK Institute (GIKI) of Engineering Sciences and Technology** GPA: **3.46** as per the American grading system Courses in thermal systems, mechanics, stress analysis, manufacturing technologies, operations management and programming, with emphasis on energy and thermal fluids.

Work Experience

February 2021 - Present	**Assistant Professor, National University of Sciences & Technology (NUST) Pakistan** At the College of Electrical & Mechanical Engineering (CEME). Courses in thermal fluids for both undergraduate and postgraduate students. Research in the domain of smart buildings and renewable technologies. PhD and PG Program coordinator for Mechanical Engineering.
August 2020 – January 2021	**Research Scholar, University of Hull UK** Optimization of the Local Exhaust Ventilation (LEV) system of the Aura Innovation Centre of the university by developing a flexible energy saving algorithm assisted with CFD simulations implementing ASHRAE standards. Additionally, assisting the Centre for Sustainable Energy Technology in proposal submissions, both on a part-time basis.
January 2017 – July 2020	**Assistant Lecturer, Faculty of Engineering & Computing at Coventry University UK** Conducting lectures, seminars, tutorials, labs and workshops for post and undergraduate courses within the domains of mechanical engineering on an hourly paid basis, after completion of comprehensive in-house training workshops.
June 2015 – November 2015	**Research Specialist, Canadian Solar EMEA GmbH Germany** Development of simulation tools providing an optimized solution for customers using a hybrid PV-Battery system along with its virtual interaction with an electricity spot market.
March 2015 – May 2015	**Patent Examination Assistant, European Patent Office Germany** Establishment of a database, classification of patents and development of searching tools for the newly created patent class Y02 (Climate change and mitigation technologies).

May 2014 – October 2014	**Research Assistant, Fraunhofer ISE Germany** Expansion of the work done during my MSc thesis - on the simulation of the Renewable Energy Model – Deutschland (REMod-D).
November 2013 - April 2014	**Master's Thesis Student, Fraunhofer ISE Germany** Development of a commercial in-house model (REMod-D) by Fraunhofer for the evaluation of the German energy policy of 2050. This programmed tool generated a combination of energy producing, storing and consuming elements for an energy system with a high share of renewables. In each simulation, an energy balance for all technologies for each hour of the year was performed. Many simulations with different parameters were triggered, until an optimum configuration was reached, by using a Particle Swarm Optimizing algorithm.
August 2009 - August 2011	**Assistant Mechanical Engineer, Descon Engineering L.L.C Qatar** Worked on different engineering, procurement, commissioning & construction (EPCC) projects in the energy sector having the different sub roles and tasks: • As a Business Developer at the regional head office of Descon • As a Project Engineer with the client "ORYX Gas to Liquids" at the project "EPCC of upgrading of the Maleic acid dosing system" • As a Planning Engineer with the client "Qatar Petroleum" at the "Fahahil oil wells annual turnaround 2010" • As a Quality Control Engineer with the client "Veolia Solutions" at the project "Installing of the water desalination units at the RLIC IW power plant" • As an Inventory Manager with the client "Fives Solios" at the project "Installing of fume treatment plants at Qatar's aluminium smelter (QATALUM)"

Technical Projects

January 2013 - June 2013	**MSc Internship, Institute of Energy Systems at TUM Germany** Development and optimization of a hybrid of an inverted Brayton cycle integrated with a SOFC for CO_2 separation and an increased overall efficiency, in Aspen Plus.
June 2012 - August 2012	**Research Assistant, Institute of Ergonomics at TUM Germany** Research on the interaction of simulations with driver support systems for both, light and heavy vehicles for the EU funded eCoMove (Cooperative Mobility Systems and Services for Energy Efficiency) project.
May 2008 - May 2009	**BS Thesis, Faculty of Mechanical Engineering at GIKI Pakistan** Design, fabrication and testing of a large scale Fluidyne Water Pump, also known as the liquid piston Stirling engine, where the pistons were columns of water oscillating in a U-tube to produce pressure pulses ideally used for pumps. Usually a renewable heat source runs this economical external combustion engine.

Skills & Additional Information

Computer skills	• Auto-Cad, Solid Works, Catia, Sketchup • Star-CCM, ANSYS, Aspen Plus, PVSyst, Simulink, SimaPro, Abaqus • C++, C, MATLAB, Python, Pascal, R • Primavera P3, MS Project, MS Office, Citavi, Origin C
Languages	Urdu **- Mother language,** English - **Fluent - C2 Level,** German - **Intermediate - B1 Level**
Extra-curricular activities	• Member of ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) and PHVACR (Pakistan Heating, Ventilation. Air Conditioning and Refrigeration) societies • Research student representative for the Faculty of Engineering & Computing at Coventry University in the academic years 2016-17 • Team manager (2012-13) of Incoming Exchange (ICX) at AIESEC Munich (the world's largest student-organized NGO) • Treasurer (2006-09) of the social welfare society "Project Topi" at GIKI
Achievements	• Doctoral bursary from the 'Charles Wallace Pakistan Trust' for an outstanding

contribution during my PhD research 2018-19
- Awarded the 'Stipendium für ausländische Studenten', Bavarian Scholarship for 2012-13 at TUM during my MSc degree
- Trainee of the Batch at the "Descon Graduate Engineers Trainee Program- 23"
- Deans Honour List (outstanding academic and extracurricular performance) in five consecutive semesters at GIKI during my BS degree
- 98% Marks in A-Levels Mathematics (distinction Islamabad zone)

Interests
- Sports & Leisure: Basketball, Cricket, Hiking, Cycling, Gardening
- Travelling: Backpacking, Socializing, Community work, Urban exploration
- Reading: Sci-fi technologies, Biographies, Engineering journals

Journal Publications

1. Khan, S., Kumar, M., Liu, S., Shen, Y., Mazhar, AR., Jie, W., Saad ul Haq, M., Sohrabi, A., Xu, Z., Chen, T. and Xiong, C. (2025). 'Development, optimization, and characterization of shape stable conductive composite phase change materials for versatile thermal energy storage needs'. Journal of Energy Storage, doi: 10.1016/j.est.2025.117231
2. Talha, T., Talha, M., Liu, S., Mazhar, AR., Perwez, U., Moiz, M. and Afzal, A. (2025). 'Experimental study of unglazed transpired solar collectors integrated with buildings in humid sub-tropics'. ***Energy & Buildings***, doi: 10.1016/j.enbuild.2025.115767
3. Chen, T., Liu, S., Wang, Y., Shen, Y., Ji, W., Xu, Z., Zhou, W. and Mazhar, AR. (2025). 'An optimization method coupling the response surface methodology and multi-objective particle swarm to enhance the performance of a novel water Trombe wall'. ***Applied Thermal Engineering***, doi: 10.1016/j.applthermaleng.2025.125785
4. Saeed, HA., Awan, YR., Khan, HS., Mazhar, AR., Aziz, S. and Jung, DW. (2025). 'Ballistic performance of lightweight ceramic-metal composite armour plates under blunt projectile impact'. ***Composites Part C: Open Access***, doi: 10.1016/j.jcomc.2025.100558
5. Shen, Y., Chen, H., Liu, S., Ji, W., Jin, H., Khan, S., Kumar, M. and Mazhar, AR. (2024). 'Analysis of influencing factors on the performance of wavy-shape solar trombe walls based on orthogonal experimental design and simulation methods'. ***Energy***, doi: 10.1016/j.energy.2024.133868
6. Zaib, A., Mazhar, AR., Talha, T., Shen, Y. and Liu, S. (2024). 'A novel numerical investigation of a solar PCM heat exchanger for indoor temperature stabilization'. ***Journal of Energy Storage***. doi: 10.1016/j.est.2024.113560
7. Khan, S., Liu, S., Kumar, M., Mazhar, AR., Shen, Y., Chen, T., Waqas, A., Zhang, S. and Rashidov, J. (2024). 'Data analysis and review of the research landscape in performance-enhancing thermal management strategies of photovoltaic technology'. ***Sustainable Energy Technologies and Assessments***. doi: 10.1016/j.seta.2024.103938
8. Shen, Y., Gao, B., Liu, S., Jin, H. and Mazhar, AR. (2024). 'Flow and heat transfer characteristics of fractal tree-shaped heat pipe in enhancing the melting process of phase change material'. ***International Journal of Heat and Mass Transfer.*** doi: 10.1016/j.ijheatmasstransfer.2024.126026
9. Aziz, S., Mazhar, AR., Ubaid, A., Shah, S., Riaz, Y., Talha, T. and Jung, D. (2024). 'A comprehensive review of membrane-based water filtration techniques'. ***Applied Water Science***. doi: 10.1007/s13201-024-02226-y
10. Butt, F., Talha, T., Khan, R., Mazhar, AR., Butt, M., Petru, J. and Seikh, A. (2024). 'Effect of the shape of flapping airfoils on aerodynamic forces'. ***Heliyon***. doi: 10.1016/j.heliyon.2024.e29561
11. Kumar, M., Khan, SY., Liu, S., Ji, W., Shen, Y., Sohrabi, A., Chen. T., Zhang, S. and Mazhar, AR. (2024). 'Scientific mapping and data analysis of the research landscape in perovskite solar cell technology'. ***Solar Energy***, doi: 10.1016/j.solener.2024.112509
12. Mazhar, AR., Shen, Y. and Liu, S. (2024). 'Viability of low-grade heat conversion using liquid piston Stirling engines'. ***WIREs Energy and Environment***, doi: 10.1002/wene.509
13. Zhang, S., Liu, S., Shen, Y., Shukla, A., Mazhar, AR. and Chen, T. (2024). 'Critical review of solar-assisted air source heat pump in China'. ***Renewable and Sustainable Energy Reviews***, doi: 10.1016/j.rser.2024.114291
14. Shen, Y., Liu, S., Jin, H., Mazhar, AR., Zhang, S., Chen, T. and Wang, Y. (2023). 'Thermal investigation and parametric analysis of cascaded latent heat storage system enhanced by porous media'. ***Applied Thermal Engineering***, doi: 10.1016/j.applthermaleng.2023.121982

15. Tabassum, R., Zaman, U., Baqai, A., Mazhar, AR. and Butt, S. (2023). 'Hybrid Additive Manufacturing: A Review from a Process Planning Perspective'. ***Journal of Advanced Manufacturing Systems***, doi: 10.1142/S0219686724500100
16. Aziz, S., Talha, T., Mazhar, AR., Ali, J. and Jung, D. (2023). 'A Review of Solar-Coupled Phase Change Materials in Buildings'. ***Materials***, doi: 10.3390/ma16175979
17. Zaib, A., Mazhar, AR., Talha, T. and Inshal, M. (2023). 'Experimental Investigation of a Solar PCM Heat Exchanger for Indoor Temperature Stabilization'. ***Energy & Buildings***, doi: 10.1016/j.enbuild.2023.113478
18. Chen, T., Liu, S., Shen, Y., Gao, B. and Mazhar, AR. (2023). 'A novel triangular pulsating heat pipe with enhanced heat transfer performance for building energy efficiency'. ***Case Studies in Thermal Engineering***, doi: 10.1016/j.csite.2023.103286
19. Zaib, A., Mazhar, AR., Aziz, S., Talha, T. and Jung, D. (2023). 'Heat Transfer Augmentation Using Duplex and Triplex Tube Phase Change Material (PCM) Heat Exchanger Configurations'. ***Energies***, doi: 10.3390/en16104037
20. Gao, B., Liu, S., Mazhar, AR., Shen, Y., Chen, T. and Zhang, S. (2023). 'A tree-shaped layout heat pipe to enhance heat transfer in a phase change material storage process'. ***Journal of Enhanced Heat Transfer,*** doi: 10.1615/JEnhHeatTransf.2023046022
21. Shen, Y., Liu, S., Mazhar, AR., Wang, J. and Li, Y. (2022). 'Phase change materials embedded with gradient porous media to alleviate overcharging problem of cascaded latent heat storage system for building heating'. ***Energy & Buildings***, doi: 10.1016/j.enbuild.2022.112746
22. Shen, Y., Mazhar, AR., Zhang, P. and Liu, S. (2022). 'Structure optimization of tree-shaped fins for improving the thermodynamic performance in latent heat storage'. ***International Journal of Thermal Sciences***, doi: 10.1016/j.ijthermalsci.2022.108003
23. Shen, Y., Mazhar, AR. and Liu, S. (2022). 'Comprehensive review on cascaded latent heat storage technology: Recent advances and challenges'. ***Journal of Energy Storage***, doi: 10.1016/j.est.2022.105713
24. Mazhar, AR., Zou, Y., Zeng, C., Shen, Y. and Liu, S. (2022). 'An algorithm to assess the heating strategy of buildings in cold climates: A case study of Germany'. ***International Journal of Low-Carbon Technologies***, doi: 10.1093/ijlct/ctac023
25. Shen, Y., Zhang, P., Mazhar, AR., Chen, H. and Liu, S. (2022) 'Experimental analysis of a fin-enhanced three-tube-shell cascaded latent heat storage system'. ***Applied Thermal Engineering***, doi: 10.1016/j.applthermaleng.2022.118717
26. Shen, Y., Mazhar, AR., Zhang, P. and Liu, S. (2022) 'Investigation of the volume impact on cascaded latent heat storage system by coupling genetic algorithm and CFD simulation'. ***Journal of Energy Storage***, doi: 10.1016/j.est.2022.104065
27. Mazhar, AR., Zou, Y., Liu, S., Shen, Y. and Shukla, A. (2021) 'Development of a PCM-HE to harness waste greywater heat: A case study of a residential building'. ***Applied Energy***, doi: 10.1016/j.apenergy.2021.118164
28. Shen, Y., Liu, Y., Liu, S. and Mazhar, AR. (2021) 'A dynamic method to optimize cascaded latent heat storage systems with a genetic algorithm: A case study of cylindrical concentric heat exchanger'. ***International Journal of Heat and Mass Transfer,*** doi: 10.1016/j.ijheatmasstransfer.2021.122051
29. Mazhar, AR., Liu, S. and Shukla, A. (2021) 'Numerical investigation of the heat transfer enhancement using corrugated pipes in a PCM for grey water harnessing'. ***Thermal Science and Engineering Progress,*** doi: 10.1016/j.tsep.2021.100909
30. Shen, Y., Liu, S., Mazhar, AR., Han, X., Yang, L. and Yang, X. (2021) 'A review of solar-driven short-term low temperature heat storage systems'. ***Renewable and Sustainable Energy Reviews***, doi: 10.1016/j.rser.2021.110824
31. Mazhar, AR., Liu, S. and Shukla, A. (2020) 'Numerical analysis of rectangular fins in a PCM for low-grade heat harnessing'. ***International Journal of Thermal Sciences***, doi: 10.1016/j.ijthermalsci.2020.106306
32. Mazhar, AR., Liu, S. and Shukla, A. (2019) 'An Optimizer Using the PSO algorithm to determine thermal parameters of PCM: A case study of grey water heat harnessing'. ***International Journal of Heat and Mass Transfer***, doi: 10.1016/j.ijheatmasstransfer.2019.118574

33. Mazhar, AR., Liu, S. and Shukla, A. (2019) 'Experimental study on the thermal performance of a grey water heat harnessing exchanger using PCMs'. ***Renewable Energy***, doi: 10.1016/j.renene.2019.08.053
34. Mazhar, AR., Liu, S. and Shukla, A. (2018) 'A state of art review on the district heating systems'. ***Renewable and Sustainable Energy Reviews***, doi: 10.1016/j.rser.2018.08.005
35. Mazhar, AR., Liu, S. and Shukla, A. (2018) 'A key review of non-industrial greywater heat harnessing'. ***Energies***, doi: 10.3390/en11020386

Book Chapters

1. Gorijan, S., Singh, R., Shukla, A. and Mazhar, AR. (2020) 'On-farm Applications of Solar PV Systems'. ***Photovoltaic Solar Energy*** **Conversion*: Technologies, Applications and Environmental Impacts,*** Elsevier Academic Press, ISBN: 978-0-128-19610-6, doi: 10.1016/B978-0-12-819610-6.00006-5
2. Mazhar, AR., Liu, S. and Shukla, A. (2020) 'Comprehensive Study of District Heating (DH) in the UK: techno-economic aspects, policy support and trends'. ***Low Carbon Energy Supply Technologies and Systems***, CRC Press Taylor & Francis Group LLC, ISBN: 978-0-367-37340-5, doi: 10.1201/9780429353192-12

Conference Publications

1. Kumar, M., Liu, S., Mazhar, AR. and Sohrabi, A. (2025). 'Evolution of thermal management systems for lithiumion battery using flexible phase change material: a comprehensive scientific mapping'. ***21st International Conference on Sustainable Energy Technologies***. UoNottingham Research Repository
2. Rehman, MZ., Zaman, UK., Mazhar, AR., Bhatti, UN. and Naveed, K. (2024). 'Design and Development of Power Generation System for Thermo-Acoustically Driven Devices'. ***2nd International Conference on Modern Technologies in Mechanical & Materials Engineering.*** EDP Sciences, doi:10.1051/matecconf/202439801010
3. Talha, M., Tariq, T., Mazhar, AR., Afzal, A. and Moiz, M. (2024). 'Effect of displacing the separation plate on the heat exchange effectiveness of unglazed double skin transpired solar collector'. ***2nd International Conference on Modern Technologies in Mechanical & Materials Engineering.*** EDP Sciences, doi:10.1051/matecconf/202439801026
4. Sher, A., Khan, U., Rafique, MN., Ikram, MA. and Mazhar, AR. (2024). 'Development and analysis of a smart cold storage system for fruit warehouses'. ***2nd International Conference on Modern Technologies in Mechanical & Materials Engineering.*** EDP Sciences, doi: 10.1051/matecconf/202439801027
5. Ubaid, A., Mazhar, AR., Riaz, Y., Aziz, S., Bhandari, KS. and Jung, D. (2024). 'Development of an Electric Powertrain for the Conversion of an ICE vehicle'. ***5th International Conference on Metal Material Processes and Manufacturing.*** Springer Nature, doi: 10.1007/978-981-97-1594-7_10
6. Mazhar, AR., Majid, A., Ali, A., Butt, MF. and Virk, AA. (2023). 'Evaluating domestic in-pipe turbines as energy harvesting devices for tropical climates'. ***3rd International Conference on Digital Futures and Transformative Technologies (ICoDT2).*** IEEE, doi: 10.1109/ICoDT259378.2023.10325698
7. Mazhar, AR., Ubaid, A., Shah, S., Masood, S. and Alvi, M. (2023). 'Investigation of the Simultaneous Cooling and Heating Using a Thermoelectric Peltier'. ***3rd International Conference on Advances in Mechanical Engineering (ICAME-23)***. MDPI Engineering Proceedings, 10.3390/engproc2023045013
8. Abdullah, M., Khan, MR., Khaleeq uz Zaman, U., Anjum, B., Khan, MA. and Mazhar, AR. (2023). 'Erosion of pipe bends for multiphase flow: An Overview'. ***6th International Conference on Energy Conservation and Efficiency (ICECE)***. IEEE., doi: 10.1109/ICECE58062.2023.10092492
9. Mazhar, AR., Khan, H., Khan, M., Ahmed, A. and Yousaf, M. (2022). 'Development and Analysis of a Liquid Piston Stirling Engine'. ***2nd International Conference on Advances in Mechanical Engineering (ICAME-22)***. MDPI Engineering Proceedings, doi: 10.3390/engproc2022023034
10. Aziz,S., Khaleeq uz Zaman, U., Mazhar, AR., Ali, J. and Jung, D. (2022). 'Development of Reciprocating Inkjet System for Printed Electronic Devices'. ***55th CIRP Conference on Manufacturing Systems.*** Elsevier Procedia CIRP, doi: 10.1016/j.procir.2022.05.085
11. Raheem, A., Khan, R., Mazhar, AR., Ya, H., Alam, MA., Ahmed, T. and Azeem, M. (2022) 'A Review of Recent Studies of Dynamometers for Cutting Force Measurement in Machining Processes'. ***2021 International Conference on Robotics and Automation in Industry (ICRAI).*** IEEE, doi: 10.1109/ICRAI54018.2021.9651342

12. Mazhar, AR., Liu, S. and Shukla, A. (2021) 'Experimental Validation of a Numerical Model of a Corrugated Pipe-Phase Change Material (PCM)-Based Heat Exchanger to Harness Greywater Heat'. ***Advances in Heat Transfer and Thermal Engineering 16th UK Heat Transfer Conference***, Springer Nature, doi: 10.1007/978-981-33-4765-6 _111

Presentations/Conferences

1. Presentation at the 'Researcher Links Workshop on Investigation of the Impact of Occupant Behaviour on Building Performance in the UK and China, at ***Coventry University*** from 2-5 June 2019
2. Presentation at the 'ASHRAE UK Midlands Chapter Regional conference on Sustainable and Low energy Building Design, at ***Loughborough University*** on 8 March 2019
3. Presentation at the 'Researcher Links Workshop on Recent advances in Energy Conservation Techniques for Buildings Workshop: From Micro scale to Urban level, at ***Istanbul Technical University*** from 4-8 December 2017
4. Poster presentation at the 'UK Particle Technology Forum organised by the IChemE Particle Technology Special Interest Group (PTSIG), at ***University of Birmingham*** on 29 March 2017
5. Poster presentations at the 'Faculty Research Symposium of Engineering, Environment and Computing, at ***Coventry University*** on 24 February 2016 and 29 March 2017
6. Presentation at the 'Warwick Manufacturing Group Researcher breakfast meeting at ***Warwick University*** on 6 December 2016
7. Supervision of high school students for a six-week summer placement in the Faculty of Engineering, Environment and Computing at ***Coventry University*** for Nuffield Research Placements 2016