Mohammad Mousa Shalby

Associate Professor- Mechanical Engineering- Renewable Energy Engineering.

Summary

Dr. Mohammad Shalby is an Associate Professor of Mechanical Engineering with over 20 years of experience at Al-Hussein Bin Talal University (AHU) in technical, teaching, and leadership roles. He is currently a Research Affiliate at the Australian Centre for Robotics (University of Sydney) and a Visiting Research Associate at the University of Wollongong. He previously served as Director of the Center for Studies, Consultations, and Community Development at Al-Hussein Bin Talal University. He holds a PhD from the University of Technology Sydney and specializes in optimizing mechanical energy systems, including wind, solar, and wave technologies. As an Australian Permanent Resident under the Global Talent program, Dr. Shalby combines advanced academic rigor with a proven ability to lead international research collaborations and build vibrant, high-impact engineering programs. His research output includes 25 journal papers and 8 conference papers, with a Scopus h-index of 13 (456 citations) and a Google Scholar h-index of 15 (642 citations).

Personal Information

mshalby82@outlook.com

Academic & Professional Experience

- **Research Affiliate, Australian Centre for Robotics, Faculty of Engineering**
  University of Sydney. | Feb 2026– present
- **Visiting Research Associate for the Faculty of Engineering and Information Sciences**
  University of Wollongong. | Feb 2026– present
- **Associate Professor of Mechanical Engineering**
  Al-Hussein Bin Talal University | July 2024– present
  - Teaching advanced courses in Mechanical Engineering and Renewable Energy Engineering.
  - Leading research in solar, wind, and wave energy systems.
  - Actively involved in aligning program learning outcomes with the Jordanian National Qualifications Framework (NQF), contributing to quality assurance and educational effectiveness in higher education.
- **Director of the Center for Studies, Consultations, and Community Development**
  Al-Hussein Bin Talal University | Oct 2022 –Jan 2026
  - Managed community outreach, consultation services, and training programs.
  - Led strategic partnerships with public and private sector institutions.
- **Director of the Human Resources Unit**
  Al-Hussein Bin Talal University | May 2023 – August 2023
  - Managed university HR operations, including staffing and organizational development.
- ***Chair of the Mechanical Engineering Department***
  Al-Hussein Bin Talal University | Sept 2019–Oct 2022
  - *Led academic planning, staff mentoring, and departmental development.*
- **Assistant Professor of Mechanical Engineering**
  Al-Hussein Bin Talal University | July 2019– July 2024
- **Teaching Assistant**
  University of Technology Sydney, Sydney, Australia | March 2019–June 2019
  - Supported undergraduate teaching in Mechanical Design, Advanced Manufacturing, and Engineering Fundamentals.
- **Technical Assistant**
  University of Technology Sydney, Sydney, Australia | Jan 2018 - Oct 2018
  - IT Services and Support Technical Assistant
- **Examination Supervision**
  University of Technology Sydney, Sydney, Australia | Feb 2017 - Jul 2017

- **Technical Support Engineer**
  Al-Hussein Bin Talal University, Ma'an, Jordan | Feb 2006- June 2015
- ***Director of Engineering Workshops Department***
  Al-Hussein Bin Talal University | June 2010- Jan 2015
    - Managed university workshop operations, technical staff, and student training, supporting practical engineering education and research infrastructure.
- ***Associate Lecturer***
  Al-Hussein Bin Talal University | June 2010- Jan 2015.
    - Taught core engineering subjects and supervised key thermal and fluid labs, emphasizing practical, application-based learning.

Education

- Ph.D., Mechanical Engineering, University of Technology Sydney, Australia (2019)
- M.Sc., Engineering Management, Mu'tah University, Karak, Jordan (2012), First Class Honors (85.78%)
- B.Sc., Mechanical Engineering, Jordan University of Science and Technology (2005)

Key Achievements, Honors, and Awards:

- Al-Hussein Bin Talal University staff representative in Manisa Celal Bayar University International Staff Week, April 2023, Manisa, Turkey.
- Al-Hussein Bin Talal University staff representative in UMinho International Staff Week, July 2022, Braga, Portugal.
- Academic advisor for the Dual-Study Program (Renewable Energy track) at AHU, 2022- 2025
- Al-Hussein Bin Talal University staff representative in the Frontiers of Science in Jordan Symposium, 2021, Jordan.
- Establishment of the Renewable Energy Engineering Department at Al-Hussein Bin Talal University, including study plans, course catalogs, accreditation, laboratory preparation, etc.
- An established member of the energy research and development center at Al-Hussein Bin Talal University.
- Winning a two-time Vice-Chancellor's Postgraduate Conference Travel Fund, University of Technology Sydney, Australia.
- Winning a Ph.D. scholarship in Engineering, 2014, at the University of Technology Sydney, Australia, sponsored by Al-Hussein Bin Talal University.
- Technical member of the established scientific centers and laboratories in Al-Hussein Bin Talal University.

Key Skills

- Renewable Energy Systems (Wave, Wind, Solar, CSP)
- CFD Simulation & Modeling
- Laboratory & Curriculum Development
- Higher Education Leadership & Administration
- Academic Advising & Postgraduate Supervision
- International Collaboration & Conference Speaking
- Project & Team Management

Communication Skills

I was a key speaker for the following conferences and workshops

1- 3rd Asian Wave and Tidal Energy Conference – AWTEC 2016, 24-28 October, Singapore.
2- 4th International Conference on Energy and Environment Research ICEER 2017, ISEP (Polytechnic of Porto, Portugal), Porto, Portugal, July 17-20, 2017.
3- The 13th Pacific-Asia Offshore Mechanics Symposium, October 14-17, Jeju, Korea, 2018.
4- IEEE-ECCE 2019, CONFERENCE & EXPO, Baltimore, MD | Sept. 29 – Oct. 3, 2019.

5- Frontiers of Science in Jordan Symposium, Renewable Energy issues in South Jordan, held at the Royal Scientific Society (RSS), 2021.
6- Regular speaker at most activities organized by the Center for Studies, Consultations, and Community Development -October 2022 – Present.

Courses Taught

- Engineering Drawing
- Engineering Mechanics (Statics and Dynamics)
- Theory of Machinery
- Engineering Measurements
- Renewable Energy Systems
- Machine Drawing
- Fluid Mechanics
- Fluid Power Control
- Energy Conversion

Examining/Advisory Committees

- **Peer Review Contributions**

1. Reviewer for multiple high-impact journals indexed in Scopus and Web of Science in the fields of mechanical and renewable energy engineering.
2. Reviewer for fellowship applications with Clarivate.
3. Conducted professional assessments for publications, including Renewable Energy, Journal of Cleaner Production, Sustainable Energy Technologies and Assessments, Journal of Engineering for the Maritime Environment, Sustainability, and Energies, among others.

- **Supervision of postgraduate students**

1. MSc in Renewable Energy Engineering, Department of Mechanical Engineering, College of Engineering, *Ahmad Khanjer Abuseif*, Al-Hussein Bin Talal University, Ma'an 2020, Thesis Title: Effect of Dust on the Wind Turbine Nacelle.
2. MSc in Renewable Energy Engineering, Department of Mechanical Engineering, College of Engineering, *Wa'ad Madallah Alhasanat*, Al-Hussein Bin Talal University, Ma'an 2022, Thesis Title: Modelling and Simulation of Solar Cell Using PC1D.

- **Member of the master's thesis examination committee for the following dissertations:**

1. MSc in Renewable Energy Engineering, Department of Mechanical Engineering, College of Engineering, *Reem Ahmad At-Tawarah*, Al-Hussein Bin Talal University, Ma'an 2020, Thesis Title: Investigation and evaluation of Wind Energy Potential for Selected Areas In Jordan.
2. MSc in Renewable Energy Engineering, Department of Mechanical Engineering, College of Engineering, *Wala'a Farouq Zaid Alomary*, Al-Hussein Bin Talal University, Ma'an 2021, Thesis Title: Geothermal Energy Harvesting In Jordan And Its Applications.
3. MSc in Renewable Energy Engineering, Department of Mechanical Engineering, College of Engineering, Hazem Abdulqader Alshakhanbeh, Al-Hussein Bin Talal University, Ma'an 2021, Thesis Title: Novel Vehicle Ventilation System Powered by Solar Energy.
4. MSc in Renewable Energy Engineering, Department of Mechanical Engineering, College of Engineering, Jehad Tawfiq Al Bdour, Al-Hussein Bin Talal University, Ma'an 2021, Thesis Title: Analysis and Study of Hybrid Renewable Energy System for Green Building to Improve Efficiency and Reduce GHG Emissions.
5. MSc in Renewable Energy Engineering, Department of Mechanical Engineering, College of Engineering, *Laith Mohammad Arrfou'*, Al-Hussein Bin Talal University, Ma'an 2021, Thesis Title: Development of Sustainable Renewable Energy System to Reduce Carbon Emission in Irrigation Stations at Off Grid Remote Area by Hybrid System.
6. MSc in Renewable Energy Engineering, Department of Mechanical Engineering, College of Engineering, *Dana Osama Al-Kabariti'*, Al-Hussein Bin Talal University, Ma'an 2021, Thesis Title: Waste to Energy; Disposable Tires to Carbon Fuel.

7. MSc in Renewable Energy Engineering, Department of Mechanical Engineering, College of Engineering, Ala'a Mahmoud Faleh, Al-Hussein Bin Talal University, Ma'an, 2022, Thesis Title: Waste Heat recovery from wind turbine cooling system using an organic Rankine cycle: Case study (Ma'an Wind Turbine farm).
8. MSc in Renewable Energy Engineering, Department of Mechanical Engineering, College of Engineering, Samah Radeh Zawadah, Al-Hussein Bin Talal University, Ma'an, 2022, Thesis Title: Lighting Management in residential sector in Jordan (Case Study).
9. MSc in Renewable Energy Engineering, Department of Mechanical Engineering, College of Engineering, Ahmad Hasan Aqatameen, Al-Hussein Bin Talal University, Ma'an, 2022, Thesis Title: Evaluation of The Impact of Heat Sink on The Solar Cell By Using A Perforated Wavy Shape Fins.

Workshop and training program

- Quality Assessor for Higher Education Institutions.
- Participated in the Manisa Celal Bayar University International Staff Week, April 2023, in Manisa, Turkey
- Participated in the UMinho International Staff Week in July 2022 in Braga, Portugal.
- Participated in a meeting of EPSRC International Partnership – Wave Energy in South Africa, University of Edinburgh, April 2022, Edinburgh, UK
- Attended the IREEDER Renewable Energy Training Workshop, Nov. 2021, Patras, Greece.
- Supported the Integration of Resource Efficient and Cleaner Production (RECP) in Academia, Jordan
- Frontiers of Science in Jordan Symposium, 2021, Jordan
- Training Program for STEMM Early Career Academics, 2021, Jordan
- Financing Schemes for Energy Efficient Buildings in Jordan and the BEP Tool, 2020, Jordan

Research Interest:

My primary research interests include:

- Design and development of Oscillating Water Column (OWC) devices for ocean wave energy harvesting.
- Enhancement of efficiency and sustainability in renewable energy technologies, including wind and solar energy systems.
- Investigation of the potential for Concentrating Solar Thermal Power (CSP) generation.
- Utilization and performance analysis of various small-scale turbines for domestic wind power generation.

Publications

- **Journal Papers**

1. Ismail, F.B., Al-Muhsen, N.F., Sultan, T., Mohammed, M.A.A., Kazem, H.A., Chaichan, M.T., **Shalby, M**. and Salah, A., 2026. Development and Assessment of Novel Thermoelectric Generator by Thermal Energy Scavenging Techniques in HVAC System. *Journal of Engineering Science and Technology*, *21*(2), pp.436-467.
2. Ahmed, M., **Shalby, M**. and Gomaa, M.R., 2026. Modelling Study of Utilizing Dry and Wet Cooling in Solar Tower Power Plant in Jordan. *International Journal of Renewable Energy Research (IJRER)*.
3. Salah, A., **Shalby**, **M**., Al-Soeidat, M. and Alhomaidat, F., 2025. Electric Vehicle Charging Infrastructure with Hybrid Renewable Energy: A Feasibility Study in Jordan. *World Electric Vehicle Journal*, *16*(10), p.557.
4. **Shalby, M**., Marashli, A. and Salah, A.A., 2025. Working Fluid Selection and Performance Analysis for Subcritical Organic Rankine Cycles. *Results in Engineering*, p.104120.
5. **Shalby, M.** and Ahmed, M., 2024. Energy and Economic Comparative Study of Dry and Wet Cooling in Solar Tower Power Plants. International Review of Mechanical Engineering (IREME), 18(6), p.283.
6. Marashli, A., Al-Kassab, A.I., Gab-Allah, D.M., **Shalby, M**. and Salah, A., 2024. Numerical Life Cycle Assessment of Lithium Ion Battery, Li-NMC Type, integrated with PV system. Results in Engineering, p.102489.
7. Salah, A.A., **Shalby, M**. and Ismail, F.B., 2023. The status and potential of renewable energy development in Jordan: exploring challenges and opportunities. Sustainability: Science, Practice and Policy, 19(1), p.2212517.
8. **Shalby, M**., Salah, A.A., Ghayda'A, M., Marashli, A. and Gomaa, M.R., 2023. An investigation of a 3D printed micro-wind turbine for residential power production. International Journal of Renewable Energy

Development, 12(3), pp.550-559.
9. **Shalby, M**., Gomaa, M.R., Salah, A., Marashli, A., Yusaf, T. and Laimon, M., 2023. Impact of the Air Filtration in the Nacelle on the Wind Turbine Performance. Energies, 16(9), p.3715.
10. Albdour, M.S., **Shalby**, M., Salah, A.A. and Alhomaidat, F., 2022. Evaluating and Enhancing the Energy Efficiency of Representative Residential Buildings by Applying National and International Standards Using BIM. Energies, 15(20), p.7763.
11. Al-Rawashdeh, H., Hasan, A.O., Gomaa, M.R., Abu-jrai, A. and **Shalby**, M., 2022. Determination of Carbonyls Compound, Ketones and Aldehydes Emissions from CI Diesel Engines Fueled with Pure Diesel/Diesel Methanol Blends. Energies, 15(21), p.7933.
12. **Shalby**, M., Abuseif, A., Gomaa, M.R., Salah, A., Marashli, A. and Al-Rawashdeh, H., 2022. Assessment of Dust Properties in Ma'an Wind Farms in Southern Jordan. Jordan Journal of Mechanical & Industrial Engineering, 16(4).
13. Marashli, A., Gasaymeh, A. and **Shalby**, **M**., 2022. Comparing the Global Warming Impact from Wind, Solar Energy and Other Electricity Generating Systems through Life Cycle Assessment Methods (A Survey). International Journal of Renewable Energy Research (IJRER), 12(2), pp.899-920.
14. Salah, A.A., Dorrell, D.G. and **Shalby**, **M**.M., 2022. Control mechanism of unbalanced magnetic pull in doubly fed induction generator using extra pole-specific stator windings. IET Electric Power Applications.
15. Marashli, A., Alfanatseh, E., **Shalby**, **M**. and Gomaa, M.R., 2022. Modelling single-effect of Lithium Bromide-Water (LiBr–H2O) driven by an evacuated solar tube collector in Ma'an city (Jordan) case study. Case Studies in Thermal Engineering, 37, p.102239.
16. Marashli, A., Al Shabaan, G., Al-Twaissi, W., **Shalby, M**. and Al-Rawashdeh, H., 2022. Impact of Accumulated Dust on Performance of Two Types of Photovoltaic Cells: Evidence from the South of Jordan. International Journal of Renewable Energy Development, 11(2).
17. Albdour, Mohammad S., Bálint Baranyai, and Mohammad M. **Shalby**. "Overview of whole-building energy engines for investigating energy-related systems." Pollack Periodica (2022).
18. Marashli, A., Gasaymeh, A., Al-Rawashdeh, H. and **Shalby**, **M**., 2021. Effect of Specific Geometrical Parameters on the Performance of Small Straight Blade–Vertical Axis Wind turbine (SB-VAWTs) of Darrieus-type. International Journal of Renewable Energy Research (IJRER), 11(4), pp.1917-1927.
19. Marashli, A., Alburdaini, M., Al-Rawashdeh, H. and **Shalby, M**., 2021. Statistical Analysis of Wind Speed Distribution Based on Five Weibull Methods for Wind Power Evaluation in Maan, Jordan. *J. Energy Technol. Policy*, *11*, pp.55-70.
20. **Shalby**, M., Elhanafi, A., Walker, P., Dorrell, D.G., Salah, A. and Gomaa, M.R., 2021. Experimental Investigation of the Small-scale Fixed Multi-chamber OWC Device. Chinese Journal of Mechanical Engineering, 34(1), pp.1-14.
21. Hani, E.B., Marashli, A., **Shalby, M**. and Al-Rawashdeh, H., 2021. Experimental investigation of basic properties biodiesel fuels (B100, B20, B5) produced from waste cooking oil (WCO) using trans-esterification process. *Int J Renew Energy Sour*, *6*.
22. Gomaa, M.R., Matarneh, G.A., **Shalby, M**. and Rawashdeh, H.A.A., 2021. A State-of-the-art Review on a Thermochemical Conversion of Carbonaceous Materials: Production of Synthesis Gas by Co-Gasification Process-Part I. *Current Alternative Energy*, *4*(1), pp.26-46.
23. Gomaa, M.R., Al-Dmour, N., AL-Rawashdeh, H.A. and **Shalby**, **M**., 2020. Theoretical model of a fluidized bed solar reactor design with the aid of MCRT method and synthesis gas production. Renewable Energy, 148, pp.91-102.
24. **Shalby** M, Elhanafi A, Walker P, Dorrell DG. CFD modelling of a small–scale fixed multi–chamber OWC device. Applied Ocean Research. 2019;88:37-47.
25. **Shalby** M, Dorrell DG, Walker P. Multi–chamber oscillating water column wave energy converters and air turbines: A review. Int J Energy Res. 2018;1–16. https://doi.org/10.1002/er.4222.

- **Conference Proceedings**

1. Salah, A.A., **Shalby, M.** and Al-Soeidat, M.R., 2024, January. Design and Development of a Hybrid Electric Vehicle Charging Station in Jordan. In 2024 4th International Conference on Smart Grid and Renewable Energy (SGRE) (pp. 1-6). IEEE.

2. Salah, A.A., **Shalby, M**. and Dorrell, D.G., 2022, November. Design of a Concentrated Pilot Solar Power Tower in Al Hussein Bin Talal University, Jordan. In 2022 IEEE PES 14th Asia-Pacific Power and Energy Engineering Conference (APPEEC) (pp. 1-5). IEEE.
3. Ismail, F.B., Mahdi, M.N., Salah, A.A., Al-Muhsen, N.F., **Shalby**, M.M. and Al Nafie, Y.K., 2021, October. Feasibility Study of Wind Energy Generation Systems in Masirah Island: Real Case Study. In 2021 International Conference on Electrical Engineering and Informatics (ICEEI) (pp. 1-6). IEEE.
4. **Shalby**, M., Dorrell, D.G., Walker, P. and Elhanafi, A., An Experimental Investigation into the Wave Power Extraction of a Small–Scale Fixed Multi–Chamber OWC Device. In 2019 IEEE Energy Conversion Congress and Exposition (ECCE) (pp. 4982-4987). IEEE.
5. **Shalby** M, Walker P, Dorrell DG, Elhanafi A. Validation of a Numerical Model for a Small-Scale Fixed Multi-Chamber OWC Device. In: Proceedings of the Thirteenth Pacific-Asia Offshore Mechanics Symposium, October 14-17, Jeju, Korea; 2018.
6. **Shalby** M, Walker P, Dorrell DG. Modelling of the multi-chamber oscillating water column in regular waves at model scale. In: Proceedings of the 4th International Conference of Energy and Environmental Research, Energy Procedia, July 17-20, Porto, Portugal; 2017.
7. **Shalby** M, Walker P, Dorrell DG. The investigation of a segment multi-chamber oscillating water column in physical scale model. In: Proceedings of the 5th International Conference on Renewable Energy Research and Applications, November 20-23 Birmingham, UK; 2016.
8. **Shalby** M, Walker P, Dorrell DG. The Characteristics of the Small Segment Multi-Chamber Oscillating Water Column. In: Proceedings of the 3rd Asian Wave and Tidal Energy Conference, October 24-28 Singapore; 2016.

Internet Multimedia

www.linkedin.com/in/mohammad-shalby-a61a12b4

www.researchgate.net/profile/Mohammad-Shalby

https://orcid.org/0000-0003-0177-5986.

ahu.edu.jo/View_Articlear.aspx?type=9&ID=0&drid=2362

scholar.google.com/citations?user=Lapl0x8AAAAJ&hl=en

https://www.scopus.com/authid/detail.uri?authorId=57193865156

References

1	Prof. David Dorrell	david.dorrell@utu.fi	+358504739787
2	Prof. Marwan Batiha	VPFAA@ahu.edu.jo	+962798224499
3	Prof. Salah Sukkarieh	salah.sukkarieh@sydney.edu.au	+61 2 9351 8154