

MUHAMMED A. HASSAN, Ph.D.

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Biography

Muhammed A. Hassan is an associate professor of Mechanical Power Engineering at Cairo University. Following his Ph.D., he has been recognized as a Fulbright visiting scholar, hosted by Texas A&M University, USA, and a research fellow at Laboratoire de Thermique, Energétique et Procédés (LaTEP), Université de Pau et des pays de l'Adour (UPPA), France. Muhammed taught and produced scholarly research at different other universities, including Zewail City of Science and Technology, and The German University in Egypt. Since 2018, he headed the Sustainable Energy Research Group at Cairo University, where he supervised 54+ alumni graduate and undergraduate research assistants. He holds 70+ indexed journal papers, 10+ peer-reviewed papers in international conferences, and one book chapter. Muhammed's expertise is mainly in the field of renewable energy resource assessment, optical and thermal enhancements of solar thermal concentrators, thermal management using nanofluids, poly-generation solar energy systems, and optimal control of district heating and cooling systems. His research has been funded by many entities, such as the German Aerospace Center, the French National Research and Technology Association, the German Federal Ministry of Education and Research, the US Department of State, NOBATEK/INEF4, King Abdullah University of Science and Technology, and Egypt's Science and Technology Development Fund. He contributed to research projects and consultancy in renewable energy and energy efficiency worldwide with a special focus on concentrating solar power and high-performance buildings. Muhammed is continuously reviewing and editing for more than 40 journals. He is a member of several international associations, such as the International Solar Energy Society and the World Society of Sustainable Energy Technologies.

Education

Ph.D. in Mechanical Power Engineering (October 2014 – January 2018)

- Faculty of Engineering, Cairo University
- Dissertation title: Solar radiation modeling using advanced statistical and machine learning techniques.

MSc in Mechanical Power Engineering (October 2012 – October 2014)

- Faculty of Engineering, Cairo University
- Thesis title: Effect of tracking orientation on the performance of parabolic trough-storage tank combination.

BSc in Mechanical Power Engineering (September 2007 – May 2012)

- Faculty of Engineering, Cairo University
- Graduation project title: Full design of a domestic solar water heating system.

Academic Experience

Research Fellow (December 2023 – Present)

- School of Architecture, University of Waterloo, 7 Melville St S, Cambridge, ON N1S 2H4, Canada.
- Project title: Decarbonization and optimal synchronous operation towards zero-energy districts in Canada.

Research Fellow (November 2022 – November 2023)

- Laboratory of Thermal Engineering, Energy and Processes (LaTEP) - Université de Pau et des Pays de l'Adour (UPPA), Pau, France.
- Project title: RESEAU CONCEPT: Tool for the design and dynamic operation of heating and/or cooling networks.
- Funded and supported by: NOBATEK/INEF4, New Aquitaine region, and the French National Research and Technology Association (ANRT).

Associate Professor (Spring 2023 - Present)

Mechanical Power Engineering Department, Faculty of Engineering, Cairo University.

Assistant Professor (Spring 2018 – Fall 2022)

Mechanical Power Engineering Department, Faculty of Engineering, Cairo University.

Egyptian PI (June 2022-November 2023)

- Partnership between Cairo University and Rutgers University, USA.
- Project title: Modeling and Monitoring of Wind Energy along Egypt's Eastern Coastline: A Spatio-Temporal Data Science Approach.

Visiting Researcher (September 2019 – April 2020)

- Zewail City of Science and Technology.
- Project title: Sensible Cooling Technologies.
- Funded by King Abdullah University of Science and Technology.

Energy Consultant (December 2018 – February 2020)

- German University at Cairo
- Project title: The Adaptability of PhotoVoltaic-Thermal Collectors to Increase the Share of REnewable Energy Production for Heating-, Cooling-, and Electric-Energy in Systems of Buildings (PVTRESyst).
- Funded by the German Federal Ministry of Education and Research (BMBF) and the German Aerospace Center (DLR).

Visiting Lecturer (Fall 2018)

REMENA Master Program (MSc degree program from Cairo University and Kassel Universität).

Visiting Lecturer (Spring 2018)

Akhbar El-Yom Academy – Mechanical Design Engineering Department

Visiting Scholar (July – September 2018)

- Texas A&M University, USA.
- Grant: Junior Faculty Development Program (JFDP).
- Funded by the US Department of State and administered by the Institute of International Education (IEE).

Data Analyst (January 2017-December 2022)

- Project title: ener-MENA Meteo Network.
- Funded by: The German Federal Foreign Office; coordinated by the Institute of Solar Research (DLR).

Visiting Teaching Assistant (Fall 2016)

Akhbar El-Yom Academy – Mechanical Design Engineering Department

Research Assistant (January 2014 – July 2015)

- Project: First Egyptian standalone solar-desalination unit.
- Funded by: Misr El-Kheir organization, Egypt.

Teaching and Research Assistant (Fall 2012 – Fall 2018)

Mechanical Power Engineering Department, Faculty of Engineering, Cairo University

Publications

H-index: 26 (Google Scholar); 24 (Scopus)

i10-index: 44

Citations: 1938 (Google Scholar); 1409 (Scopus)

- **Peer-reviewed journal articles:**

1. Nasser, A., Kassem, M. A., Hassan, M. A., Hamed, A. (2024) A preliminary investigation of a novel solar-powered absorption-desiccant-radiant cooling system for thermally active buildings. *Solar Energy*, 275, 112642.
2. Abd Elfadeel, S. M., Hassan, M. A., Aljabr, A., Alharbi, B. (2024) Performance characterization of a novel integrated radiant wall system for sustainable heating. *Journal of Thermal Analysis and Calorimetry*. In Press.
3. Abdel-Mawla, M. A., Hassan, M. A., Khalil, A., Araji, M. T. (2024) Optimizing the characteristic cooling curves of PCM-integrated thermally active buildings: Experimental and numerical investigations. *Journal of Energy Storage*, 89, 111748.
4. Abd Elfadeel, S. M., Fouad, A., Galal, A., Hassan, M. A., Almeahmadi, F. A., Araji, M. T., Aljabr, A., Alharbi, B. (2024). A novel approach to clean polygeneration using a triple-function compound parabolic solar collector. *Energy Conversion and Management*, 308, 118403.
5. El-kenawy, E. M., Bailek, N., Bouchouicha, K., Zerouali, B., Hassan, M. A., Kuriq, A., Jamil, B., Colak, I., Khalil, A., Ibrahim, A. (2024) Global-scale solar energy harnessing: An advanced intra-hourly diffuse solar irradiance predicting framework for solar energy projects. *Neural Computing and Applications*, 36, 10585–10598.
6. Hassan, M. A., Serra, S., Sochard, S., Viot, H., Marias, F., Reneaume, J-M (2024). Holistic non-linear optimization of the layout, sizing, and operation of a district heating plant. *Energy Conversion and Management*, 301, 118079.
7. Al-Ghussain, L., Ahmad, A. D., Abubaker, A. M., Hassan, M. A. (2024) A country-scale green energy-water-hydrogen nexus: Jordan as a case study. *Solar Energy*, 269, 112301.
8. Abdelghafar, M. M., Hassan, M. A., Kayed, H. (2024). Comprehensive analysis of combined power cycles driven by sCO₂-based concentrated solar power: Energy, exergy, and exergoeconomic perspectives. *Energy Conversion and Management*, 301, 118046.
9. Kamel, M. M., Hassan, M. A., Salem, H., Huzayyin, O. A. (2023). Comparative studies of Markov chain-based driving cycles for light-duty vehicles. *Transportation Planning and Technology*, DOI: 10.1080/03081060.2023.2294343.
10. Hassan, M. A., Serra, S., Sochard, S., Viot, H., Marias, F., & Reneaume, J.-M. (2023). Optimal scheduling of energy storage in district heating networks using nonlinear programming. *Energy Conversion and Management*, 295, 117652.
11. Hassan, M. A., Fouad, A., Dessoki, K., & Kassem, M. A. (2023). Grid search-based geometric optimization of a trapezoid-shaped solar receiver. *Thermal Science and Engineering Progress*, 43, 101943.

12. Hassan, M. A., Fouad, A., Dessoki, K., Al-Ghussain, L., & Hamed, A. (2023). Performance analyses of supercritical carbon dioxide-based parabolic trough collectors with double-glazed receivers. *Renewable Energy*, 215, 118884.
13. Kalidasan, B., Chinnasamy, S., Pandey, A. K., Hassan, M. A., & Sharma, K. (2023). Thermal performance analysis of solar box cookers using different fin configurations: An experimental investigation. *Journal of Thermal Analysis and Calorimetry*, 148, 7421–7440.
14. Ismail, O. A., Ali, A. M., Hassan, M. A., & Gamea, O. (2023). Geometric optimization of pin fins for enhanced cooling in a microchannel heat sink. *International Journal of Thermal Sciences*, 190, 108321.
15. Marouf, Z. M., Hassan, M. A., & Fouad, M. A. (2023). Energy, exergy, and economic (3E) analysis of air bubbles injection into plate heat exchangers. *Journal of Thermal Analysis and Calorimetry*, 148, 6311–6325.
16. Hassan, M. A., Galal, A., Sayed, M., Dessoki, K., Fouad, A., Eskarous, E. T., Khalil, A., & Elsayed, A. A. (2023). Performance assessment and Pareto front mapping of a novel truncated elliptic cavity solar receiver. *Applied Thermal Engineering*, 226, 120319.
17. ElKasaby, M. M., Hassan, M. A., & Khalil, A. (2023). Energy and economic performance assessment of a solar-assisted regenerative vacuum membrane desalination system. *Applied Thermal Engineering*, 225, 120181.
18. Hassan, M. A., Galal, A., Al-Ghussain, L., Sayed, M., Abubaker, A. M., Darwish Ahmad, A., & Kassem, M. A. (2023). Internally shielded receivers for parabolic trough solar concentrators operating with supercritical carbon dioxide: Analytical assessment. *Energy Conversion and Management*, 280, 116789.
19. Hassan, M. A., Salem, H., Bailek, N., & Kisi, O. (2023). Random Forest Ensemble-Based Predictions of On-Road Vehicular Emissions and Fuel Consumption in Developing Urban Areas. *Sustainability*, 15(2), 1503.
20. Al-Ghussain, L., Hassan, M. A., & Hamed, A. (2023). Modeling and techno-economic optimization of overhead panels and reflectors in near-wall mounted PV systems. *Solar Energy*, 249, 624–641.
21. Al-Ghussain, L., Ahmad, A. D., Abubaker, A. M., Hovi, K., Hassan, M. A., & Annuk, A. (2023). Techno-economic feasibility of hybrid PV/wind/battery/thermal storage trigeneration system: Toward 100% energy independency and green hydrogen production. *Energy Reports*, 9, 752–772.
22. Kalidasan, B., Hassan, M. A., Pandey, A. K., & Chinnasamy, S. (2023). Linear cavity solar receivers: A review. *Applied Thermal Engineering*, 221, 119815.
23. Al-Ghussain, L., Taylan, O., Abujubbeh, M., & Hassan, M. A. (2023). Optimizing the orientation of solar photovoltaic systems considering the effects of irradiation and cell temperature models with dust accumulation. *Solar Energy*, 249, 67–80.
24. Hamed, A., Al-Ghussain, L., Hassan, M. A., & Annuk, A. (2022). Techno-economic analysis for optimal configurations of PV systems with back reflectors. *Energy Reports*, 8, 14979–14996.
25. Kaood, A., Elhagali, I. O., & Hassan, M. A. (2023). Investigation of high-efficiency compact jet impingement cooling modules for high-power applications. *International Journal of Thermal Sciences*, 184, 108006.
26. Djaafari, A., Ibrahim, A., Bailek, N., Bouchouicha, K., Hassan, M. A., Kuriqi, A., Al-Ansar, N., & El-kenawy, E. S. M. (2022). Hourly predictions of direct normal irradiation using an innovative hybrid LSTM model for concentrating solar power projects in hyper-arid regions. *Energy Reports*, 8, 15548–15562.
27. Abdel-Mawla, M. A., Hassan, M. A., & Khalil, A. (2022). Impact of placement and design of phase change materials in thermally activated buildings. *Journal of Energy Storage*, 56, 105886.
28. Al-Ghussain, L., Darwish Ahmad, A., Abubaker, A. M., Mohamed, M. A., Hassan, M. A., & Akafuah, N. K. (2022). Optimal sizing of country-scale renewable energy systems towards green transportation sector in developing countries. *Case Studies in Thermal Engineering*, 39, 102442.

29. Alrbai, M., Hayajneh, H., Arakza, F., Enizat, J., Al-Dahidi, S., Al-Ghussain, L., & Hassan, M. A. (2022). Techno-economic analysis of a solar-powered humidification-dehumidification desalination system under fogging effect. *Sustainable Energy Technologies and Assessments*, 53, 102752.
30. Hassan, M. A., Hassan, M. A., Banerjee, D., & Hegab, H. (2022). Evolutionary optimization of thermo-physical properties of MWCNT-Fe₃O₄/water hybrid nanofluid using least-squares support vector regression-based models. *Applied Soft Computing*, 130, 109644.
31. Marouf, Z. M., Fouad, M. A., & Hassan, M. A. (2022). Experimental investigation of the effect of air bubbles injection on the performance of a plate heat exchanger. *Applied Thermal Engineering*, 217, 119264.
32. Hassan, M. A., & Kaood, A. (2022). Multi-criteria assessment of enhanced radiant ceiling panels using internal longitudinal fins. *Building and Environment*, 224, 109554.
33. Yehia, M. H., Hassan, M. A., Abed, N., Khalil, A., & Bailek, N. (2022). Combined Thermal Performance Enhancement of Parabolic Trough Collectors Using Alumina Nanoparticles and Internal Fins. *International Journal of Engineering Research in Africa*, 62, 107–132.
34. Hassan, M. A., Bailek, N., Bouchouicha, K., Ibrahim, A., Jamil, B., Kuriqi, A., Nwokolo, S. C., & El-kenawy, E. S. M. (2022). Evaluation of energy extraction of PV systems affected by environmental factors under real outdoor conditions. *Theoretical and Applied Climatology*, 150, 715–729.
35. Hassan, M. A., & Abdelaziz, O. (2022). A novel adaptive predictive control strategy of hybrid radiant-air cooling systems operating in desert climates. *Applied Thermal Engineering*, 214, 77–84.
36. Jamei, M., Bailek, N., Bouchouicha, K., Hassan, M. A., Elbeltagi, A., Kuriqi, A., Al-Ansar, N., Almorox, J., & El-Kenawy, E. S. M. (2023). Data-Driven Models for Predicting Solar Radiation in Semi-Arid Regions. *Computers, Materials and Continua*, 74, 1625–1640.
37. El-kenawy, E. S. M., Zerouali, B., Bailek, N., Bouchouich, K., Hassan, M. A., Almorox, J., Kuriqi, A., Eid, M., & Ibrahim, A. (2022). Improved weighted ensemble learning for predicting the daily reference evapotranspiration under the semi-arid climate conditions. *Environmental Science and Pollution Research*, 29, 81279–81299.
38. Abdel-Mawla, M. A., Hassan, M. A., & Khalil, A. (2022). Phase change materials in thermally activated building systems: A comprehensive review. *International Journal of Energy Research*, 46, 11676–11717.
39. Al-Ghussain, L., Ahmad, A. D., Abubaker, A. M., & Hassan, M. A. (2022). Exploring the feasibility of green hydrogen production using excess energy from a country-scale 100% solar-wind renewable energy system. *International Journal of Hydrogen Energy*, 47, 21613–21633.
40. Abubakr, M., Akoush, B., Khalil, A., & Hassan, M. A. (2022). Unleashing deep neural network full potential for solar radiation forecasting in a new geographic location with historical data scarcity: a transfer learning approach. *European Physical Journal Plus*, 137, 474.
41. Fadodun, O. G., Kaood, A., & Hassan, M. A. (2022). Investigation of the entropy production rate of ferrosferric oxide/water nanofluid in outward corrugated pipes using a two-phase mixture model. *International Journal of Thermal Sciences*, 178, 107598.
42. Hassan, M. A., Al-Tohamy, A. H., & Kaood, A. (2022). Hydrothermal characteristics of turbulent flow in a tube with solid and perforated conical rings. *International Communications in Heat and Mass Transfer*, 134, 106000.
43. Al-Ghussain, L., Darwish Ahmad, A., Abubaker, A. M., & Hassan, M. A. (2022). Techno-economic feasibility of thermal storage systems for the transition to 100% renewable grids. *Renewable Energy*, 189, 800–812.
44. Hassan, M. A., Al-Ghussain, L., Khalil, A., & Kaseb, S. A. (2022). Self-calibrated hybrid weather forecasters for solar thermal and photovoltaic power plants. *Renewable Energy*, 188, 1120–1140.
45. Keshtegar, B., Bouchouicha, K., Bailek, N., Hassan, M. A., Kolahchi, R., & Despotovic, M. (2022). Solar irradiance short-term prediction under meteorological uncertainties: survey hybrid artificial intelligent basis music-inspired optimization models. *European Physical Journal Plus*, 137, 362.

46. El-kenawy, E. S. M., Ibrahim, A., Bailek, N., Bouchouicha, K., Hassan, M. A., Jamei, M., & Al-Ansari, N. (2022). Sunshine duration measurements and predictions in Saharan Algeria region: an improved ensemble learning approach. *Theoretical and Applied Climatology*, 147, 1015–1031.
47. El-Kenawy, E. S. M., Ibrahim, A., Bailek, N., Bouchouicha, K., Hassan, M. A., Jamil, B., & Al-Ansari, N. (2022). Hybrid Ensemble-Learning Approach for Renewable Energy Resources Evaluation in Algeria. *Computers, Materials and Continua*, 71, 5837–5854.
48. Hassan, M. A., Al-Ghussain, L., Ahmad, A. D., Abubaker, A. M., & Khalil, A. (2022). Aggregated independent forecasters of half-hourly global horizontal irradiance. *Renewable Energy*, 181, 365–383.
49. Amein, H., Akoush, B. M., El-Bakry, M. M., Abubakr, M., & Hassan, M. A. (2022). Enhancing the energy utilization in parabolic trough concentrators with cracked heat collection elements using a cost-effective rotation mechanism. *Renewable Energy*, 181, 250–266.
50. Abd Elfadeel, S. M., Amein, H., El-Bakry, M. M., & Hassan, M. A. (2021). Assessment of a multiple port storage tank in a CPC-driven solar process heat system. *Renewable Energy*, 180, 860–873.
51. Ismail, O. A., Kassem, M. A., & Hassan, M. A. (2021). Sleeping pods with radiant cooling panels: A first assessment of thermal comfort and cooling capacity. *Energy and Buildings*, 250, 111282.
52. Hassan, M. A., Kassem, M. A., & Kaood, A. (2022). Numerical investigation and multi-criteria optimization of the thermal-hydraulic characteristics of turbulent flow in conical tubes fitted with twisted tape insert. *Journal of Thermal Analysis and Calorimetry*, 147, 6847–6868.
53. Kaood, A., Abubakr, M., Al-Oran, O., & Hassan, M. A. (2021). Performance analysis and particle swarm optimization of molten salt-based nanofluids in parabolic trough concentrators. *Renewable Energy*, 177, 1045–1062.
54. Hassan, M. A., Khalil, A., & Abubakr, M. (2021). Selection methodology of representative meteorological days for assessment of renewable energy systems. *Renewable Energy*, 177, 34–51.
55. Amein, H., Kassem, M. A., Ali, S., & Hassan, M. A. (2021). Integration of transparent insulation shells in linear solar receivers for enhanced energy and exergy performances. *Renewable Energy*, 171, 344–359.
56. Hassan, M. A., Bailek, N., Bouchouicha, K., & Nwokolo, S. C. (2021). Ultra-short-term exogenous forecasting of photovoltaic power production using genetically optimized non-linear auto-regressive recurrent neural networks. *Renewable Energy*, 171, 191–209.
57. Huzayyin, O. A., Salem, H., & Hassan, M. A. (2021). A representative urban driving cycle for passenger vehicles to estimate fuel consumption and emission rates under real-world driving conditions. *Urban Climate*, 36, 100810.
58. Hassan, M. A., Akoush, B. M., Abubakr, M., Campana, P. E., & Khalil, A. (2021). High-resolution estimates of diffuse fraction based on dynamic definitions of sky conditions. *Renewable Energy*, 169, 641–659.
59. Abubakr, M., Hassan, M. A., Krolczyk, G. M., Khanna, N., & Hegab, H. (2021). Sensors selection for tool failure detection during machining processes: A simple accurate classification model. *CIRP Journal of Manufacturing Science and Technology*, 32, 108–119.
60. Hassan, M. A., Abubakr, M., & Khalil, A. (2021). A profile-free non-parametric approach towards generation of synthetic hourly global solar irradiation data from daily totals. *Renewable Energy*, 167, 613–628.
61. El-Bakry, M. M., Kassem, M. A., & Hassan, M. A. (2021). Passive performance enhancement of parabolic trough solar concentrators using internal radiation heat shields. *Renewable Energy*, 165, 52–66.
62. Abbas, A. T., Abubakr, M., Hassan, M. A., Luqman, M., Soliman, M. S., & Hegab, H. (2020). An adaptive design for cost, quality and productivity-oriented sustainable machining of stainless steel 316. *Journal of Materials Research and Technology*, 9, 14568–14581.
63. Kaood, A., & Hassan, M. A. (2020). Thermo-hydraulic performance of nanofluids flow in various internally corrugated tubes. *Chemical Engineering and Processing Process Intensification*, 154, 108043.

64. Hassan, M. A., & Abdelaziz, O. (2020). Best practices and recent advances in hydronic radiant cooling systems – Part II: Simulation, control, and integration. *Energy and Buildings*, 224, 110263.
65. Abubakr, M., Amein, H., Akoush, B. M., El-Bakry, M. M., & Hassan, M. A. (2020). An intuitive framework for optimizing energetic and exergetic performances of parabolic trough solar collectors operating with nanofluids. *Renewable Energy*, 157, 130–149.
66. Bailek, N., Bouchouicha, K., Hassan, M. A., Slimani, A., & Jamil, B. (2020). Implicit regression-based correlations to predict the back temperature of PV modules in the arid region of south Algeria. *Renewable Energy*, 156, 57–67.
67. Hassan, M. A., & Banerjee, D. (2019). A soft computing approach for estimating the specific heat capacity of molten salt-based nanofluids. *Journal of Molecular Liquids*, 281, 365–375.
68. Bouchouicha, K., Hassan, M. A., Bailek, N., & Aoun, N. (2019). Estimating the global solar irradiation and optimizing the error estimates under Algerian desert climate. *Renewable Energy*, 139, 844–858.
69. Hassan, M. A., Khalil, A., Kaseb, S., & Kassem, M. A. (2018). Independent models for estimation of daily global solar radiation: A review and a case study. *Renewable and Sustainable Energy Reviews*, 82, 1565–1575.
70. Hassan, M. A., Khalil, A., Kaseb, S., & Kassem, M. A. (2017). Exploring the potential of tree-based ensemble methods in solar radiation modeling. *Applied Energy*, 203, 897–916.
71. Hassan, M. A., Khalil, A., Kaseb, S., & Kassem, M. A. (2017). Potential of four different machine-learning algorithms in modeling daily global solar radiation. *Renewable Energy*, 111, 52–62.

- **Book chapters:**

1. Hassan, M. A. Thermal management and performance enhancement of parabolic trough concentrators using nanofluids. In *"Nanotechnology Applications for Solar Energy Systems"*, Sheikholeslami, M. (ed.). 1st edition (2023). Pages: 125-144. John Wiley & Sons Ltd.

- **Peer-reviewed conference proceedings:**

1. Hassan, M. A. Calibrated cooling curves of thermally activated building systems in hot arid climates. In *3rd International Conference on New Trends on Sustainable Energy: From Waste to Energy (ICNTSE)*, March 2022, Alexandria, Egypt.
2. Bouchouicha, K., Bailek, N., Hassan, M. A., Abdel-Hadi, Y. A., Jamil, B., El-Shimy, M., Nwokolo, S. C. Improved empirical modeling for PV output power estimation of various photovoltaic technologies in arid desert regions. In *7th Arab Conference on Astronomy and Geophysics*, October 2021, Cairo, Egypt.
3. Rashad, M., Khalil, E. E., Hassan, M. A., El-Degwy, A. CFD simulation Analyses of airflow Patterns around chillers in a mechanically ventilated room. In *AIAA SciTech 2021 Forum*, January 2021, Virtual event.
4. Hassan, M. A., Abdelaziz, O. A novel adaptive predictive control strategy of hybrid radiant-air cooling systems in hot and dry climates. In *15th International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics (HEFAT)*, July 2021, Virtual conference.
5. Abdeldayem, A., Elkhatib, M., Abdelaziz, O., Hassan, M. A. Parametric Study of Location and Temperature of Thermally Activated Slabs in Hybrid Radiant Cooling Systems. In *15th International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics (HEFAT)*, July 2021, Virtual conference.
6. El-Malky, A., Fouad, M.A., Kassem, M.A., Hassan, M. A. Performance and economic analysis of a solar-assisted heating and cooling network in Cairo, Egypt. In *Vision of Solar Energy in the Kingdom of Saudi Arabia: Applications and Challenges (VSESA)*, Al Qassim, KSA, December 2020.
7. Hassan, M. A., Khalil, A., Kaseb, S., Kassem, M.A. Static and dynamic forecasting of solar radiation: A comparative study. In *17th International Conference on Sustainable Energy Technologies (SET2019)*. Kuala Lumpur, Malaysia, August 2019.

8. Youssef, A., Hesham, A., Ismail, O., Tarek, O., Maged, M., Hassan, M. A., Khalil, A. Sizing and Simulating the Performance of a Standalone Solar Water Pumping and Pasteurization System for Remote Egyptian Oases. In *17th International Conference on Sustainable Energy Technologies (SET2019)*. Kuala Lumpur, Malaysia, August 2019.
9. Hassan, M. A., Kayed, H., Hanafi, A. S. An investigation of thermal performance and temperature control of stratified storage tank in solar-MED desalination. In *4th International Conference on Nuclear and Renewable Energy Resources (NURER)*, Antalya, Turkey, October 2014.
10. Hassan, M. A., Kayed, H., Hanafi, A. S. Simulation of tracking configuration effect on the performance of solar parabolic trough-storage tank combination. In *4th International Conference on Nuclear and Renewable Energy Resources (NURER)*, Antalya, Turkey, October 2014.

- **Keynote and invited speeches:**

1. Analytical modeling and performance characterization of trapezoid-shaped receivers for parabolic trough solar concentrators. Invited speech at the *International Conference on Renewable and Sustainable Energy (RENEWABLEENG-2023)*, Barcelona, Spain, 2023.
2. Performance analysis of a solar-assisted regenerative vacuum membrane desalination system. Invited speech at the *9th International Conference on Energy Engineering and Environment Engineering (ICEEEE2022)*, Sanya, China, 2022.
3. Auto-weighted forecasters of solar irradiance for the management of solar power systems. Keynote speech at the *9th International Conference on New Energy and Sustainable Development (NESD)*, Sanya, China, 2022.
4. Boosting the thermal capacitance of thermally activated buildings using phase change materials. Invited speech at the *7th International Conference on New Energy and Future Energy Systems (NEFES)*, Nanjing, China, 2022.
5. Incorporating phase change materials in thermally activated buildings: Thermal comfort and energy savings. Invited speech at the *3rd International Conference on Energy Material and Energy Technology (EMET)*, Sanya, China, 2022.
6. Performance assessment and optimization of linear cavity solar receivers. Keynote speech at the *2nd International Conference on Fluid and Chemical Engineering (ICFCE)*, Wuhan, China, 2022.
7. Calibrated cooling curves of thermally activated building systems in hot arid climates. Invited speech at the *3rd International Conference on New Trends on Sustainable Energy: From Waste to Energy (ICNTSE)*, Alexandria, Egypt, 2022.

- **Report and working papers:**

1. Hassan, M. A. Optical and Thermal Performance Enhancement of Concentrating Solar Collectors. AME GSC seminar series. University of Oklahoma 2020.
2. Hassan, M. A, Khalil, T. The Adaptability of Photo-Voltaic-Thermal Collectors to Increase the Share of Renewable Energy Production for Heating-, Cooling- and Electric-Energy in Systems of Buildings: Progress. Award Ceremony for the 2nd German-African Innovation Incentive Award ('GAIIA'), March 2020, Berlin, Germany.
3. Hassan, M. A, Banerjee, D. A soft computing approach for estimating the specific heat capacity of molten salt-based nanofluids. NSF Workshop on Exuberance of Machine Learning in Transport Phenomena. Dallas, Texas, 2020.
4. Hassan, M. A. An optimized optical model of parabolic trough solar collector using MCRT method. Technical Report: Cairo University, 2015.
5. Hassan, M. A., Kayed, H., Hanafi, A. S. Effect of tracking configuration on the performance of parabolic trough collectors in a solar-desalination unit. Technical Report: Cairo University, 2015.
6. Hassan, M. A., Kayed, H., Hanafi, A. S. Performance simulation of the parabolic trough collectors in a solar-desalination unit. Technical Report: Cairo University, 2015.

- **Journal article manuscripts (under review)**

1. Fouad, A., Galal, A., Dessoki, K., Eldakamawy, M. H., Hassan, M. A., Araji, M. T. Influence of geometric design variables on the performance of a novel V-shaped cavity receiver. Under review in *Renewable Energy* (2nd revision).
2. Tarek, N., Nabil, M., Hassan, M. A., Kayed, H. Multi-port water jet impingement cooling modules: Impact of area ratio and average port area. Under review in *Heat Transfer* (2nd revision).
3. Hassan, M. A., Araji, M. T. Hierarchical optimization of district heating plants by integrating evolutionary and non-linear programming algorithms. Under review in *Applied Energy* (2nd revision).
4. Hassan, M. A., Hassan, M. A., A. De Bartolomeis, J. Betts, A. Shokrani, H. Hegab. Minimum Quantity Lubrication-based Machining: Nanoparticles, Electrostatics, and Cooling Techniques. Under review in *Journal of Cleaner Production* (1st revision).
5. Ali, A. M., Ismail, O. A., Upot, N. V., Hassan, M. A., El Khodary, K., El Morsi, M., Miljkovic, N. A Comprehensive review of multiphase correlations used in numerical studies of flow boiling phenomena. Under review in *International Journal of Heat and Mass Transfer* (1st revision).
6. Ibrahim, H. M., Hassan, M. A., Ahmed, A., Kayed, H. Thermal and hydraulic characteristics of a single reverse nanofluid jet in a double-wall cooling configuration. Under review in *Journal of Thermal Analysis and Calorimetry* (1st revision).
7. Al-Ghussain, L., Hassan, M. A., Alrbai, M., Al-Dahidi, S., Lu, Z., Araji, M. T. Green Hydrogen Horizon: Techno-economic Feasibility and Life Cycle Assessment in the MENA Region. Under review in *Applied Energy* (1st revision).

Grants and Funds

- 1- Rutgers University's annual global fund program (2022) – 8,000 USD.
- 2- Annual fund calls, Cairo University (2019-2021) – ~32,000 USD.
- 3- Fulbright Junior Faculty Development Program (JFDP) grant (2018) – Personal stipend: 5,230 USD.
- 4- Schlumberger sponsorship (2010, 2011, and 2012).

- **Proposals under review:**

- 1- PI: Decarbonization and optimal synchronous operation towards zero-energy districts in Canada. AMTD Waterloo Global Talent Postdoctoral Fellowship. University of Waterloo, Canada.
- 2- Egyptian PI: Solar-thermal-powered systems for hydrogen and electricity production, air conditioning, and water desalination. Submitted to: Arab Research & Innovation Co-Funded Alliances.
- 3- Consultant: Novel hybrid evaporative-cooling and cleaning of photovoltaic panels in hot and arid locations: Experimental and numerical investigation. Submitted to: Young Scholars Grant (YSG), Saudi Basic Science Initiative, Research, Development, and Innovation Authority (RDIA), KSA.

Awards and Honors

1. Listed among the distinguished top 2% of scholars worldwide based on the October 2023 iteration of the "Updated science-wide author databases of standardized citation indicators", issued by Stanford University and published by Elsevier.
2. Excellence award in postgraduate studies from the Faculty of Engineering, Cairo University (2021).
3. Best paper at the 15th International Conference on Heat Transfer, Fluid Mechanics, and Thermodynamics (HEFAT 2021).
4. Cairo University award for best Ph.D. thesis in Mechanical Power Engineering (2020).
5. Four scientific publishing excellence awards from Cairo University (2018, 2019, 2020, and 2021).
6. Three awards of accomplishment and excellence within the JFDP program, from Texas A&M University, Fulbright Commission in Egypt, and Institute of International Education (IIE), 2018.

7. Four awards of outstanding contribution in scientific reviewing from Elsevier.
8. Two distinguished researcher awards from the Mechanical Power Engineering Department (2017) and Cairo University (2018).
9. Two academic excellence awards from the Faculty of Engineering (2009 and 2010).

Reviewing, Editing, and Conference Organization

- **Editing:**

1. Academic Editor: Journal of Engineering - Mechanical Engineering, Wiley (2022-Present).
2. Guest editor of the special issue "Solar-Powered Polygeneration Systems for Residential and Industrial Applications". Energies (MDPI), 2021.

- **Reviewing for Journals:**

Nature Communications	Renewable Energy
Applied Energy	Thermal Science and Engineering Progress
Energy	Solar Energy
Urban Climate	Energy and Environment
Measurement	Alexandria Engineering Journal
Energy Reports	Ain Shams Engineering Journal
Plos One	Cogent Environmental Science
Heliyon	Cleaner Energy Systems
Energies	ASME Journal of Heat Transfer
Energy Engineering	IET Renewable Power Generation
Scientific Reports	Indoor and Built Environment
Building and Environment	Artificial Intelligence Review
Ingeniería e Investigación	Mathematical Biosciences and Engineering
Frontiers in Built Environment	Mathematical Problems in Engineering
Journal of Energy Storage	Applied Thermal Engineering
Journal of Cleaner Production	International Journal of Green Energy
Energy Conversion and Management	Advances in Applied Science Research
Theoretical and Applied Climatology	International Journal of Ambient Energy
Renewable and Sustainable Energy Reviews	Clean Technologies and Environmental Policy
Applied Computing and Informatics	International Journal of Energy Research
Thermal Science and Engineering Progress	KSCE Journal of Civil Engineering
Energy Sources, Part A: Recovery, Utilization, and Environmental Effects	Chemical Engineering and Processing: Process Intensification
Journal of Advanced Research in Fluid Mechanics and Thermal Sciences	Sustainable Energy Technologies and Assessments
Journal of Energy Resources Technology	

- **Technical/organization committee membership of international conferences:**

1. 9th International Conference on New Energy and Sustainable Development (NESD), Sanya, China, 2022.
2. 2nd International Conference on Energy, Environment, and Storage of Energy (ICEESEN), 2022, Turkey.
3. 4th International Conference on Renewable Energy, Resources and Sustainable Technologies (Energytech 2022), Rome, Italy.
4. 5th International Symposium on Hydrogen Energy and Energy Technologies (HEET 2022), November 2022, Osaka, Japan.
5. 2nd International Conference on Fluid and Chemical Engineering (ICFCE 2022), China.
6. 6th International Conference on Green Energy and Applications (ICGEA 2022), Singapore.

7. 1st International Conference on Innovative Applied Energy (DZENERGY 2021), Algeria.

Academic Supervision

- **Ph.D. Students:**

1. M. Abdelghafar. Energy, exergy, and exergoeconomic analysis of combined power cycles driven by sCO₂-based concentrated solar power. Cairo University (ongoing).
2. M. Abdel-Mawla. Assessment of the use of phase change materials in radiant cooling systems under hot arid climates. Cairo University (2023).
3. Z. Moustafa. Air injection as a heat transfer enhancement method. Cairo University (2023).

- **MSc Students:**

1. H. Ibrahim. Numerical investigation of thermal and hydraulic characteristics of a single reverse jet utilizing nanofluids in double-wall cooling configuration. Cairo University (2023).
2. A. Nasser. Dynamic modeling of hybrid solar thermal power-driven desiccant air conditioning systems for thermally active buildings. Cairo University (2023).
3. M. El-Kasaby. Modeling and techno-economic performance assessment of a solar-assisted water desalination system. Cairo University (2022).
4. M. Kamel. Development of Markov chain-based driving cycles for light-duty vehicles in Greater Cairo. Cairo University (2022).
5. Y. Kumar. Development of an online transfer learning approach to forecast vertical power flows for renewable energy systems. Kassel Universität (2022).
6. A. Abdelmoteleb. Estimation of wind power generation curtailment due to grid congestion with an artificial neural network. Kassel Universität (2021).
7. H. Amin. Integration of transparent insulation shells in linear solar receivers for enhanced energy and exergy performances. Cairo University (2021).
8. M.M. El-Bakry. An investigation of passive performance enhancement of parabolic trough concentrators using internal radiation heat shields: A numerical investigation. Cairo University (2021).
9. P.V. Rao. Application of machine learning methods on wind turbine service reports. Kassel Universität (2020).
10. A. Abdelkawi. Performance evaluation of direct and indirect absorption linear Fresnel reflectors operating with nanofluid. Cairo University (2020).
11. A. El-Malky. Evaluation of potential and limitations of a solar-assisted district heating and cooling network in Egypt. Cairo University (2020).
12. M. Mohammed. A CFD simulation of airflow distribution around air-cooled chillers for optimal placement. Cairo University (2020).
13. M. Hafez. Enhancing the thermal performance of parabolic trough solar collectors using nanofluids and internal longitudinal fins. Cairo University (2020).
14. M. Rashad. CFD simulation and parametric optimization of airflow distribution around chillers in a mechanically ventilated room. Cairo University (2020).
15. D. Thanki. Energy and exergy analysis for optimal performance of a combined photovoltaic/thermal collector using FEM simulation. Kassel Universität (2019).

- **BSc Students:**

1. K. Awad, M. Ali, A. El-ghamry, M. Mostafa, N. Ibrahim. A new concept of effective cold plates suited for additive manufacturing. Cairo University (2022).
2. A. Galal, A. Fouad, E. Eskarous, K. Dessouki, M. Sayed. Evaluating the optical and thermal performance of a low-tech linear solar cavity receiver. Cairo University (2022).
3. H. Ramadan, A. Ismayil, S. Ahmed, A. Zad, T. Ahmed, T. Elsaid. Experimental and numerical investigations of thermally activated building systems. Cairo University.

4. R. Saeed, S Abd El-Fadeel, H Atta, T Abd El-Wahab, A Yousry, M Shamardl. A portable solar power-driven desalination system. Cairo University (2020).
5. A. Abd El Aliem, H. Ewes, H. Abd El Fatah, M. Nagaty, M. Galal, M. Zein. Sizing and simulating the performance of a water/space heating system using linear Fresnel solar concentrators. Cairo University (2019).
6. A. Youssef, A. Hesham, O.A. Ismail, O. Tarek, M. Maged. Concept development and simulation of a stand-alone solar power-driven hybrid system for remote oases in Egypt. Cairo University (2019).
7. B. Ibrahim, H. Gomaa, O. Asaad, M. Tharwat. A portable test rig for evaluating solar collectors. The German University in Cairo (2019).

Taught Courses

- **Postgraduate courses:**

Numerical Methods in Energy Sciences	Renewable Energy
Technical Writing	Convective Heat Transfer

- **Undergraduate Courses:**

Heat Transfer	Advanced Air Conditioning	Hydraulic Machines
Thermodynamics	Conventional Power Plants	Thermal Machines
Fluid Mechanics	Heat and Mass Transfer	Numerical Methods
Renewable Energy	Engineering Measurements	Refrigeration & Air Conditioning
Internal Combustion Engines		

Other Academic Activities

1. Member of the Department Laboratories Advancement Committee (2020-2022).
2. Instructor at the Renewable Energy Laboratory, Cairo University (2016-2022).
3. Member of the department's research plan committee (2018-2019).
4. Consultant at Centre of Studies and Training, Cairo University (2018).
5. Member of the department's quality assurance unit for international accreditation (2013-2018).

Professional Membership

1. Member: International Solar Energy Society ISES (since 2020).
2. Member: World Society of Sustainable Energy Technologies WSSET (since 2019).
3. Member: Fulbright Alumni Community (since 2018).
4. Professional Engineer: Egyptian Engineer's Syndicate (since 2012).
5. Member: Cairo University Staff Club (since 2012).

Training Experience

- **Faculty development courses and trainings:**

2018	Teaching Assistant Institute Preparation, Center for Teaching Excellence, Texas A&M University.	
2012-2022	Faculty and Leadership Development Centre (FLDC), Cairo University:	
	Effective Presentation Skills	Communication Skills
	Exams and Student Evaluation Systems	Meetings and Time Management
	Academic Code of Ethics	Academic Management
	E-learning	Managing Research Teams
	Quality Standards in Teaching	Use of Technology in Teaching
	Scientific Publishing	Critical Thinking
	Basics of Blended Learning	Education for Sustainable Development
	Digital Transformation	Question Banks

Legal and Financial Aspects in Academic Environment

- ***Internships and professional training:***

- 2019 Analysing wind data and planning wind power farms using WASP; NREA, Egypt
- 2018 Solar Heat for Industrial Processes (SHIP), UNIDO
- 2011 Khalda Petroleum Company
- 2011 Ministry of Industry and Trading
- 2010 National Research Center (NRC)
- 2009 Arab Contractors (OAO & Co.)

Language Skills

Arabic: Mother tongue

English: Proficient

French: Basic use

Computer Skills

Matlab; OpenModelica; FMI; Julia; Engineering Equations Solver; Python; SolidWorks; AutoCAD; SketchUp; Solar Advisor Model; Meteonorm; TRNSYS; PVsyst; PolySun; SolTrace; Tonatiuh; TracePro; Labview; ANSYS Fluent; COMSOL Multiphysics; FloXpress; Minitab; EnergyPlus; HAP; Open Studio; RadPro; BEOpt; GIMP; OriginLab.