

# Mohammad Saghafifar

OBJECTIVE Working/Researching in Mechanical and Energy Engineering

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RESEARCH INTERESTS Energy, Renewable energy, Concentrated solar power, Photovoltaic, Gas turbine, Gas turbine inlet cooling, Power generation, Thermal energy storage, Energy storage, Compressed air energy storage, Solar electricity generation, Solar air conditioning, Chemical looping, Carbon capture and storage, Solar thermochemical processes, Solar water desalination, Hydrogen generation

EDUCATION **University of Cambridge**, Cambridge, U.K.

PhD in Engineering, *Expected* December 2020

- CGPA:-
- Thesis Topic: *Chemical looping electricity storage systems*
- Advisor: [Stuart Scott, Ph.D](#)

**American University of Sharjah**, Sharjah, UAE

Master of Science in Mechanical Engineering, January 2016

- CGPA: 4/4
- Thesis Topic: *Thermo-economic optimization of hybrid combined power cycles using heliostat field collector (PDF)*
- Advisor: [Mohamed Gadalla, Ph.D](#)

Bachelor of Science in Mechanical Engineering, July 2012

- CGPA: 3.71/4
- *Magna Cum Laude*

REFEREED JOURNAL PUBLICATIONS

1. **Saghafifar, M.**, Schnellmann, M., Scott, S., “Chemical looping electricity production.” *Applied Energy*, 2020.
2. **Saghafifar, M.**, Mohammadi, K. , and Powell, K. “Design and analysis of a dual-receiver direct steam generator solar power tower plant with a flexible heliostat field.” *Sustainable Energy Technologies and Assessments*, 39:100698, 2020.
3. **Saghafifar, M.**, and Gabra, S. “A critical overview of solar assisted carbon capture systems: Is solar always the solution?.” *Journal of Greenhouse Gas Control*, 92:102852, 2020.
4. Mohammadi, K., Khaledi, MSE, **Saghafifar, M.**, and Powell, K. “Hybrid systems based on gas turbine combined cycle for trigeneration of power, cooling, and freshwater: A comparative techno-economic assessment.” *Sustainable Energy Technologies and Assessments*, 37:100632, 2020.
5. **Saghafifar, M.**, and Gadalla, M. “A critical assessment of thermo-economic analyses of different air bottoming cycles for waste heat recovery.” *International Journal of Energy Research*, 43(4):1315–1341, 2019.
6. Mohammadi, K., **Saghafifar, M.**, McGowan, J., and Powell, K. “Thermo-economic analysis of a novel hybrid multigeneration system based on an integrated triple effect refrigeration system for production of power and refrigeration.” *Journal of Cleaner Production*, 238:117912, 2019.

7. Mohammadi, K., **Saghafifar, M.**, Ellingwood, and K., Powell, K. “Hybrid concentrated solar power (CSP)-desalination systems: A review.” *Desalination*, 468:114083, 2019.
8. **Saghafifar, M.**, Omar, A., Mohammadi, K., Alashkar, A., and Gadalla, M. “A review of unconventional bottoming cycles for waste heat recovery: Part I- Analysis, design, and optimization.” *Energy Conversion and Management*, 198:110905, 2019.
9. Mohammadi, K., McGowan, J., and **Saghafifar, M.** “Thermoeconomic analysis of multi-stage recuperative Brayton power cycles: Part I- Hybridization with a solar power tower system.” *Energy Conversion and Management*, 198:110905, 2019.
10. **Saghafifar, M.**, Gadalla, M., and Mohammadi, K. “Thermo-economic analysis and optimization of heliostat fields using AINEH code: Analysis of Implementation of Non-Equal Heliostats (AINEH).” *Renewable Energy*, 185:898–919, 2019.
11. Omar, A., **Saghafifar, M.**, Mohammadi, K., Alashkar, A., and Gadalla, M. “A review of unconventional bottoming cycles for waste heat recovery: Part II- Applications.” *Energy Conversion and Management*, 180:559–583, 2019.
12. Mohammadi, K., **Saghafifar, M.**, and McGowan, J. “Thermo-economic evaluation of several feasible modifications to the gas power plant with air bottoming combined cycle for different applications.” *Energy Conversion and Management*, 172:619–644, 2018.
13. Mohammadi, K., Naderi, M., and **Saghafifar, M.** “Economic feasibility and environmental benefits of developing grid-connected photovoltaic plants in the southern coast of Iran.” *Energy*, 156:17–31, 2018.
14. Gadalla, M., and **Saghafifar, M.** “A concise overview of heliostat fields-solar thermal collectors: Current state of art and future perspective.” *International Journal of Energy Research*, 42(10):3145–3163, 2018.
15. Gadalla, M., and **Saghafifar, M.** “Energy and Exergy analyses of integration of pulse combustor in air bottoming cycle power plants.” *Applied Thermal Engineering* 121:674–687, 2017.
16. **Saghafifar, M.**, and Gadalla, M. “Thermo-economic optimization of hybrid solar Maisotsenko bottoming cycles using heliostat field collector: Comparative analyses.” *Applied Energy*, 190:686–702, 2017.
17. **Saghafifar, M.**, and Gadalla, M. “Thermo-economic evaluation of water-injected air bottoming cycles hybridization using heliostat field collector: Comparative analyses.” *Energy*, 119:1230–1246, 2017.
18. **Saghafifar, M.**, Omar, A., Erfanmoghaddam, S, and Gadalla, M. “Thermo-economic analysis of recuperated Maisotsenko bottoming cycle using triplex air saturator: Comparative analyses.” *Applied Thermal Engineering*, 111:431–444, 2017.
19. **Saghafifar, M.**, and Poullikkas, A. “Comparative analysis of power augmentation in air bottoming cycles.” *International Journal of Sustainable Energy*, 36(1):47–60, 2017.
20. Gadalla, M. and **Saghafifar, M.**, “Thermo-economic and comparative analyses of two recently proposed optimization approaches for circular heliostat fields: Campo radial-staggered and biomimetic spiral.” *Solar Energy*, 136:197–209, 2016.

21. Omar, A., **Saghafifar, M.**, and Gadalla, M. “[Thermo-economic Analysis of Air Saturator Integration in Conventional Combined cycles.](#)” *Applied Thermal Engineering*, 107:1104–1122, 2016.
22. **Saghafifar, M.**, and Gadalla, M. “[Thermo-economic analysis of air bottoming cycle hybridization using heliostat field collector: A comparative analysis.](#)” *Energy* 112:698–714, 2016.
23. Gadalla, M., and **Saghafifar, M.** “[Performance assessment and transient optimization of air precooling in multi-stage solid desiccant air conditioning systems.](#)” *Energy Conversion and Management*, 119:187–202, 2016.
24. **Saghafifar, M.**, and Gadalla, M. “[Thermo-economic analysis of conventional combined cycle hybridization: United Arab Emirates case study.](#)” *Energy Conversion and Management*, 111:358–374, 2016.
25. **Saghafifar, M.**, and Gadalla, M. “[Performance assessment of integrated PV/T and solid desiccant air-conditioning systems for cooling buildings using Maisotsenko cooling cycle.](#)” *Solar Energy*, 127:79–95, 2016. (25 most downloaded articles Feb 2016 – May 2016)
26. **Saghafifar, M.**, and Poullikkas, A. “[Thermo-economic optimization of air bottoming cycles.](#)” *Journal of Power Technologies*, 95(3):211–220, 2015.
27. **Saghafifar, M.**, and Gadalla, M. “[Innovative inlet air cooling technology for gas turbine power plants using integrated solid desiccant and Maisotsenko cooler.](#)” *Energy*, 87:663–677, 2015.
28. **Saghafifar, M.**, and Gadalla, M. “[Analysis of Maisotsenko open gas turbine power cycle with a detailed air saturator model.](#)” *Applied Energy*, 149:338–353, 2015. Featured by the [Advances in Engineering website](#) as a key scientific article.
29. **Saghafifar, M.**, and Gadalla, M. “[Analysis of Maisotsenko open gas turbine bottoming cycle.](#)” *Applied Thermal Engineering*, 82:351–359, 2015.

CONFERENCE  
PUBLICATIONS

1. Madurawala, D., **Saghafifar, M.**, and Gadalla, M. “[Thermodynamic Analysis and Design of a Heliostat Field to Co-Produce Hydrogen and Electricity.](#)” In *ASME 2017 International Mechanical Engineering Congress and Exposition IMECE2017.*, 2017, Tampa
2. **Saghafifar, M.**, and Gadalla, M. “A thermoeconomic comparative analysis between different approaches of specific carbon dioxide emission reduction for a simple gas turbine power plant.” In *proceedings of 9th International Exergy, Energy and Environment Symposium.*, 2017, Split
3. **Saghafifar, M.**, and Gadalla, M. “[Selecting a proper design period for heliostat field layout optimization using Campo code.](#)” In *SPIE Optics + Photonics for Sustainable Energy symposium.*, 2016, San Diego
4. Gadalla, M., and **Saghafifar, M.** “[Performance assessment and transient optimization of multi-stage solid desiccant air conditioning systems with building PV/T integration.](#)” In *SPIE Optics + Photonics for Sustainable Energy symposium.*, 2016, San Diego
5. **Saghafifar, M.**, and Gadalla, M. “[Improvement in spiral heliostat field layout thermo-economic performance by field zoning implementation.](#)” *ASME 2016 Power and Energy Conference and Exhibition.*, 2016, Charlotte North Carolina

6. Gadalla, M., and **Saghafifar, M.** “Integrating a pulse combustor in air bottoming cycle power plants.” *In proceedings of 7th International Exergy, Energy and Environment Symposium.*, 2015, Valenciennes
7. **Saghafifar, M.**, and Gadalla, M. “Solid Desiccant Air Conditioning System Using Maisotsenko Cooling Cycle in UAE.” *In Proceedings of third International Conference on Water, Energy, and the Environment.*, 2015, Sharjah

BOOK CHAPTERS

1. **Saghafifar, M.**, and Gadalla, M. “[Thermoeconomic Comparative Analyses of Different Approaches Used for Specific Carbon Dioxide Emission Reduction in Gas Turbine Power Plants.](#)” *The Role of Exergy in Energy and the Environment.*, Springer, Cham, 2018. 71-95.
2. Gadalla, M., and **Saghafifar, M.** “[Integrating a pulse combustor in air bottoming cycle power plants.](#)” *Exergy for A Better Environment and Improved Sustainability 1.*, Springer, Cham, 2018. 819-841.

REVIEWER  
EXPERIENCE

Ad hoc Reviewer

- [International Journal of Refrigeration](#)
- [Energy Conversion and Management](#)
- [Applied Thermal Engineering](#)
- [Applied Energy](#)
- [Energy](#)
- [Solar Energy](#)
- [Journal of Renewable and Sustainable Energy](#)
- [International Journal of Earth and Environmental Science](#)
- [International Journal of Energy Research](#)
- [Renewable Energy](#)
- [Renewable and Sustainable Energy Reviews](#)
- [Journal of Building Engineering](#)
- [Scientific Reports](#)

RESEARCH  
EXPERIENCE

**Research Assistant**

Feb 2014 to June 2017

Department of Mechanical Engineering,  
American University of Sharjah  
Supervisor: Mohamed Gadalla, Ph.D

AWARDS

Student Awards — American University of Sharjah,

- Finalist in [Future Generation Competition Middle East Electricity](#) Feb 2017
- Petrofac scholarship 2010–2012
- Chancellor’s Award Oct 2009, Oct 2010
- Dean’s list scholarship 2008–2012
- Merit scholarship 2008–2012

RELEVANT  
PROJECTS

Finite Element

- Finite element analysis on heat transfer through a plate Apr 2012
- Finite element analysis on a hydro-power truss March 2012
- Rayleigh-Ritz approach employment for a tapered axial bar displacement Feb 2012

Control and Measurement

- PID, Lead, and Lag controller design for a DC motor Apr 2012
- PID, Lead, and Lag controller design for a Boeing’s commercial aircraft Dec 2011

	<ul style="list-style-type: none"> <li>• Liquid level measurement tool design with Linear Variable Differential Transformer</li> </ul>	Apr 2011
	Solid Mechanics	
	<ul style="list-style-type: none"> <li>• A hovercraft steering mechanism design</li> <li>• A 20 kg mechanical water lifter design</li> <li>• A robot with bull behavior simulation design</li> </ul>	Dec 2011 Apr 2011 July 2010
	Fluid Mechanics and Thermal sciences	
	<ul style="list-style-type: none"> <li>• An inlet air cooling for air bottoming cycle power plants</li> <li>• A 120 kWe air bottoming cycle power plant</li> <li>• A crude oil transportation pipeline</li> <li>• A 10 kWe based solar thermal power plant</li> <li>• Velocity and pressure coefficients flow field for a specific NACA Airfoil</li> </ul>	Apr 2014 Dec 2013 Apr 2012 Apr 2012 Dec 2011
TEACHING EXPERIENCE	<p>Course Supervisor</p> <p>IIA 3A5 - Thermodynamics and Power Generation Module Leader: Dr. Epaminondas Mastorakos Lecturers: Dr. Epaminondas Mastorakos and Dr. Alex White Department of Engineering, University of Cambridge</p> <p>Co-advisor</p> <p>MCE 490 - Senior Design Project Hybrid combined power cycles Main advisor: Dr. Mohamed Gadalla Department of Mechanical Engineering, American University of Sharjah</p> <p>Co-instructor</p> <p>MCE 241R - Thermodynamics I Recitation Instructor: Dr. Mohammad Hasan Nazzal Department of Mechanical Engineering, American University of Sharjah</p> <p>Teaching Assistant</p> <p>MCE 226L - Computer Applications in MCE I Instructor: Grigorios Georgakis, and Rami Shunnag Department of Mechanical Engineering, American University of Sharjah</p> <p>MCE 326L - Computer Applications in MCE II Instructors: Grigorios Georgakis, and Rami Shunnag Department of Mechanical Engineering, American University of Sharjah</p>	<p>Fall 2018–present</p> <p>Fall 2015–Spring 2016</p> <p>Spring 2014</p> <p>Fall 2012–Spring 2015</p>
ELECTIVE COURSES	<p>American University of Sharjah, Undergraduate</p> <ul style="list-style-type: none"> <li>• Partial Differential Equation, Applied Finite Element Analysis</li> <li>• Turbo Machines, Hydraulic of Pipelines Systems,</li> <li>• Kinematic and Dynamic of Machinery</li> </ul> <p>American University of Sharjah, Graduate</p> <ul style="list-style-type: none"> <li>• HVAC Systems Design, Optimization of Power Plants, Advanced Thermo-fluid</li> </ul> <p>University of Cambridge, Graduate</p> <ul style="list-style-type: none"> <li>• Present and Future Energy Systems, Clean Fossil Fuel Technologies</li> </ul>	

American University of Sharjah, other

- Financial Management, Marketing Concepts, General Psychology, Principles of Macroeconomics, Principles of Microeconomics

HARDWARE AND SOFTWARE SKILLS Computer Programming

- C, MATLAB, EES

Software

- AutoCAD, Inventor, 3ds max
- ANSYS, FEMLAB
- Latex, Microsoft Office

QUALIFICATION

- TOEFL (Total Score: 113, Reading: 29, Listening: 30, Writing: 28, Speaking: 26)
- GRE (Quantitative: 166/91%, Verbal Reasoning: 148/38%, Analytical Writing: 3/17%)
- FE (Fundamental of Engineering)

REFERENCES

Available on request