

## Mohammad Abutayeh

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## Education

2003–2010 (intermittent): Doctor of Philosophy in Chemical Engineering, University of South Florida, Tampa, FL  
1997–1999: Master of Science in Chemical Engineering, University of South Florida, Tampa, FL  
1994–1997: Bachelor of Science in Chemical Engineering, University of South Florida, Tampa, FL  
1991–1994: Associate in Arts, St. Petersburg Junior College, St. Petersburg, FL

## Academic Experience

2020–Now: Assistant Professor, Mechanical Engineering Department, Colorado State University, Fort Collins, CO  
2012–2017: Assistant Professor, Mechanical Engineering Department, Khalifa University, Abu Dhabi, UAE  
2007–2010: Graduate Assistant, Clean Energy Research Center, University of South Florida, Tampa, FL  
1997–2010 (seasonal): GT Assistant, Chemical Engineering Department, University of South Florida, Tampa, FL

## Corporate Experience

2012–Now: Part-Time Consultant, NextEra Energy Resources, Juno Beach, FL  
2012–Now: Part-Time Consultant, Saeta Yield, Madrid, Spain  
2010–2012: Senior Professional, NextEra Energy Resources, Juno Beach, FL  
2004–2006: Project Engineer, Kemco Systems, Clearwater, FL  
2002–2003: Patent Examiner, US Patent & Trademark Office, Arlington, VA  
2001–2002: Control & Instrumentation Engineer, Orica USA, Watkins, CO  
2000–2001: Control Systems Engineer, International Paper, Courtland, AL  
1998–2000: Network Designer, Hal-Tec Engineering, Tampa, FL

## Technical Skills

- Industrial: Allen Bradley PLC, Foxboro DCS, IBM transistor–transistor logic, Intel CPU assembly language, National Instruments DAQ data acquisition system, OR with MS Excel and Visual Basic for Applications, PI Process Book
- Language: Fluency in Arabic and English
- Software: Adobe Acrobat Professional, ArcGIS, Aspen, AutoCAD, ChemCAD, Comsol, FORTRAN, HTML, IPSEpro, Maple, MathCAD, Matlab, Microsoft Office Suite, Polymath, System Advisor Model, TK Solver, UNIX, Visual Basic

## Professional Affiliation

- American Institute of Chemical Engineers
- American Society of Mechanical Engineers
- American Solar Energy Society
- Clean Energy Research Center
- Florida State Board of Professional Engineers
- International Society of Automation
- Mine Safety and Health Administration
- Phi Theta Kappa Honor Society
- Solar Power and Chemical Energy Systems
- United Kingdom Energy Research Center
- University of South Florida Alumni Association

## Books

- M Abutayeh, DY Goswami, S Al-Kharabsheh, Solar Distillation and Drying, Module in: Earth Systems and Environmental Sciences, Elsevier Press, Amsterdam, Netherlands, 2015, ISBN 978-0-1240-9548-9
- M Abutayeh, C Li, DY Goswami, EK Stefanakos, Solar Desalination, Chapter in: Desalination: Water from Water, Scrivener Publishing, Salem, MA, 2014, ISBN 978-1-1182-0852-6
- M Abutayeh, Simulation of Passive Vacuum Solar Flash Desalination, Lambert Academic Publishing, Saarbrücken, Germany, 2010, ISBN 978-3-8383-8875-5
- M Abutayeh, Thermodynamic Model of Phosphate Lattice Loss, Lambert Academic Publishing, Saarbrücken, Germany, 2010, ISBN 978-3-8383-9102-1

## Journal Publications

- K Abugazleh, M Abutayeh, H Ali, K Jeong, Fate and Transport Analysis of a Dowtherm–A Chemical Release Event, *Process Safety Progress*, November 2023
- M Abutayeh, K Jeong, Retrofitting Solar Power Plants with Thermal Energy Storage, *International Journal of Renewable Energy Technology*, July 2020
- M Abutayeh, K Jeong, A Alazzam, B Khasawneh, Reducing Optical Losses in Parabolic Trough Collector Solar Fields, *Springer Proceedings in Energy*, March 2020
- M Abutayeh, R Vasquez–Padilla, M Lake, M Sedighi, Y Too, J Garcia, K Jeong, Effect of Short Cloud Shading on the Performance of Parabolic Trough Solar Power Plants: Motorized vs Manual Valves, *Renewable Energy*, November 2019
- A Alazzam, N Alamoodi, M Abutayeh, I Stiharu, V Nerguizian, Fabrication of Porous Gold Film Using Graphene Oxide as a Sacrificial Layer, *Materials*, July 2019
- M Abutayeh, K Jeong, A Alazzam, B Khasawneh, Streamlining the Power Generation Profile of Concentrating Solar Power Plants, *Solar Energy Engineering Journal*, April 2019
- M Abutayeh, Y Addad, E Abu–Nada, A Alazzam, Doping Solar Field Heat Transfer Fluid with NanoParticles, *Solar Energy Engineering Journal*, February 2019
- W Waheed, A Alazzam, E Abu–Nada, S Khashan, M Abutayeh, A Microfluidics Device for 3D Switching of Microparticles Using Dielectrophoresis, *Journal of Electrostatics*, August 2018
- M Abutayeh, M Maalouf, Improved Modeling of Solar Flash Desalination Using Support Vector Regression, *Energy Engineering Journal*, August 2017
- Y Addad, M Abutayeh, E Abu–Nada, Effects of Nanofluids on the Performance of a PCM–Based Thermal Energy Storage System, *Energy Engineering Journal*, August 2017
- M Abutayeh, A Alazzam, Adapting Steady State Solar Models to Incorporate Transients, *Solar Energy Engineering Journal*, April 2017
- B Mathew, A Alazzam, S Khashan, M Abutayeh, Lab–on–Chip for Liquid Biopsy (LoC–LB) Based on Dielectrophoresis, *Talanta Journal*, March 2017
- S Al–Hanaei, S Al–Shomali, M Abutayeh, Performance Model of Shams I Solar Power Plant, *Heat Transfer Engineering Journal*, November 2016
- B Mathew, A Alazzam, M Abutayeh, I Stiharu, Model–Based Analysis of a Dielectrophoretic Microfluidic Device for Field–Flow Fractionation, *Separation Science Journal*, August 2016
- M Maalouf, D Homouz, M Abutayeh, Accurate Prediction of Preheat Temperature in Solar Flash Desalination Systems Using Kernel Ridge Regression, *Energy Engineering Journal*, June 2016
- B Mathew, A Alazzam, M Abutayeh, A Gawanmeh, Modeling the Trajectory of Microparticles Subjected to Dielectrophoresis in a Microfluidic Device for Field Flow Fractionation, *Chemical Engineering Science Journal*, July 2015
- M Abutayeh, A Alazzam, B Khasawneh, Optimizing Thermal Energy Storage Operation, *Solar Energy Journal*, October 2015
- M Abutayeh, A Alazzam, B Khasawneh, Balancing Heat Transfer Fluid Flow in Solar Fields, *Solar Energy Journal*, July 2014
- M Abutayeh, DY Goswami, EK Stefanakos, Solar Thermal Power Plant Simulation, *Environmental Progress & Sustainable Energy Journal*, July 2013
- M Abutayeh, DY Goswami, EK Stefanakos, Theoretical and Experimental Simulation of Passive Vacuum Solar Flash Desalination, *Solar Energy Engineering Journal*, May 2013
- M Abutayeh, Thermodynamic Analysis of Electrolyte Systems: A Methodical Approach for Modeling the Behavior of Aqueous Electrolyte Systems, *Chemical Engineering Magazine*, March 2012
- M Abutayeh, DY Goswami, Experimental Simulation of Solar Flash Desalination, *Solar Energy Engineering Journal*, November 2010
- M Abutayeh, DY Goswami, Passive Vacuum Solar Flash Desalination, *American Institute of Chemical Engineers Journal*, May 2010
- M Abutayeh, SW Campbell, Predicting the Citrate Soluble Loss of the Dihydrate Process, *Industrial & Engineering Chemistry Research Journal*, September 2009
- M Abutayeh, DY Goswami, Solar Flash Desalination under Hydrostatically Sustained Vacuum, *Solar Energy Engineering Journal*, August 2009

## Conference Proceedings

- S Aryal, M Abutayeh, YM Kim, K Jeong, Analytical Modelling on Simultaneous Phase Transitions in Low Temperature Evaporator for Organic Rankine Cycle Applications, *World Congress on Mechanical, Chemical, and Material Engineering*, Prague, Czech Republic, August 2022

- M Abutayeh, K Jeong, A Alazzam, B Khasawneh, Absorber End Loss Attenuation of Parabolic Trough Collectors, AIChE Annual Meeting, Orlando, FL, November 2019
- M Abutayeh, A Alazzam, B Khasawneh, Streamlining the Power Generation Profile of Concentrating Solar Power Plants, ASME 12<sup>th</sup> International Conference on Energy Sustainability, Lake Buena Vista, FL, June 2018
- M Abutayeh, Y Addad, E Abu-Nada, A Alazzam, Doping Solar Field Heat Transfer Fluid with NanoParticles, ASME International Mechanical Engineering Congress & Exposition, Tampa, FL, November 2017
- M Abutayeh, A Alazzam, B Khasawneh, A Case Study Of Augmenting Solar Power Generation With Thermal Energy Storage, ASME 10<sup>th</sup> International Conference on Energy Sustainability, Charlotte, NC, June 2016
- A Gawanmeh, A Alazzam, B Mathew, M Abutayeh, H Sung, Formalizing the Movement of Microparticles in a Continuous Flow Microfluidic Device for Field Flow Fractionation using Event-Driven Methods, IEEE 17<sup>th</sup> International Conference on E-Health Networking, Application, & Services, Boston, MA, October 2015
- B Mathew, A Alazzam, M Abutayeh, I Stiharu, Modeling Microparticles' Path in DEP-FFF Microfluidic Device, IEEE 10<sup>th</sup> Regional Symposium on Micro and Nanoelectronics, Kuala Terengganu, Malaysia, August 2015
- M Abutayeh, Adapting Steady State Solar Power Models to Incorporate Transients, ASME 9<sup>th</sup> International Conference on Energy Sustainability, San Diego, CA, July 2015
- M Abutayeh, Modeling Dual-Tank Molten Salt Thermal Energy Storage Systems, ASME International Mechanical Engineering Congress & Exposition, Montreal, QC, November 2014
- M Abutayeh, Operating Logic of Thermal Energy Storage Systems, ICHMT 10<sup>th</sup> International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics, Orlando, FL, July 2014
- S Al-Hanaei, S Al-Shomali, M Abutayeh, Performance Model of Shams I CSP Plant, ICHMT 10<sup>th</sup> International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics, Orlando, FL, July 2014
- M Abutayeh, M Maalouf, Improved Modeling of Solar Flash Desalination via Support Vector Regression, The Industrial and Systems Engineering Research Conference, Montreal, QC, June 2014
- M Humood, A Farraj, A Alsheghri, A Hammadi, M Abutayeh, Experimental Study of a Solar Thermal Desalination Unit, ASME International Mechanical Engineering Congress & Exposition, San Diego, CA, November 2013
- A Alazzam, B Khasawneh, M Abutayeh, Simple Fast and Low Cost Fabrication Methods of Microchannels for Manipulation of Living Cells, ASME International Mechanical Engineering Congress & Exposition, San Diego, CA, November 2013
- M Abutayeh, A Alazzam, B Khasawneh, Balancing Heat Transfer Fluid Flow in Solar Fields, ISES Solar World Congress, Cancun, Mexico, November 2013
- M Abutayeh, DY Goswami, EK Stefanakos, Solar Thermal Power Plant Simulation, AIChE Annual Meeting, Minneapolis, MN, October 2011
- M Abutayeh, DY Goswami, EK Stefanakos, Sustainable Desalination Process Simulation, ASME International Mechanical Engineering Congress & Exposition, Vancouver, BC, November 2010
- C. Li, M Abutayeh, DY Goswami, EK Stefanakos, Seawater Desalination Using Solar Energy, Florida Section of AWWA Regional Conference, Orlando, FL, November 2010
- M Abutayeh, SW Campbell, Phosphate Lattice Loss Simulation, AIChE International Phosphate Fertilizer & Sulfuric Acid Technology Conference, Clearwater, FL, June 2010
- M Abutayeh, DY Goswami, Experimental Simulation of Solar Flash Desalination, ASME International Mechanical Engineering Congress & Exposition, Lake Buena Vista, FL, November 2009
- M Abutayeh, DY Goswami, Passive Vacuum Solar Flash Desalination, AIChE Annual Meeting, Philadelphia, PA, November 2008
- M Abutayeh, DY Goswami, Solar Flash Desalination under Hydrostatically Sustained Vacuum, ASME 2<sup>nd</sup> International Conference on Energy Sustainability, Jacksonville, FL, August 2008

## Research Grants

- Co-Principal Investigator, Numerical Simulation of Heat and Mass Transfer in Condensing Heat Exchangers for Water and Energy Recovery in Power Plants, Korea Institute of Machinery and Materials, \$ 284 K, January 2018
- Principal Investigator, Streamlining Power Generation of Concentrating Solar Power Plants, Eleanor Lane and Nathan Deutsch Faculty Development Endowment Funds, \$ 1500, November 2017
- Principal Investigator, Travel Award to Initiate Collaboration on Energy-Related Research, Oak Ridge Associated Universities, \$ 800, July 2017
- Principal Investigator, Balancing Heat Transfer Fluid Flow in Solar Fields, Khalifa University Internal Research Fund, \$ 55 K, January 2014
- Co-Principal Investigator, A Novel Microdevice for Separation of Rare Cells from Blood Using Traveling Surface Acoustic Waves and Dielectrophoresis, Khalifa University Internal Research Fund, \$ 820 K, September 2013
- Co-Principal Investigator, Novel Microfabrication of Microfluidic Device with 3D Patterned Microelectrodes Structure for Bio-Applications, Khalifa University Internal Research Fund, \$ 55 K, January 2013