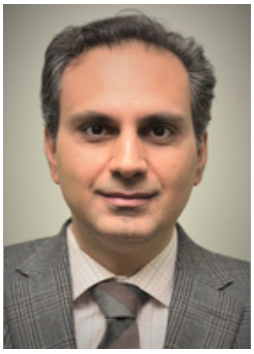
CURRICULUM VITAE



Siamak Farhad

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Co-Director of the Manufacturing Graduate Certificate Program
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EDUCATION

Ph.D. in Mechanical Engineering, University of Waterloo (Canada), 2012
Dissertation: *Performance Simulation of Planar Solid Oxide Fuel Cells*
Advisor: Prof. Feridun Hamdullahpur (University President)

M.Sc. in Mechanical Engineering, Amirkabir University of Technology (Iran), 2002
Thesis: *Optimization of Steam Power Plants Using Pinch Technology and Exergy Analysis*
Advisor: Prof. Majid Saffar-Avval

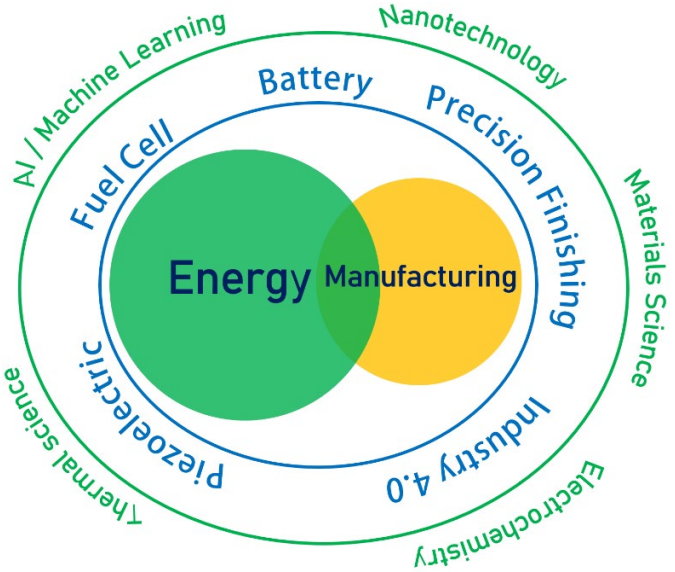
B.Sc. in Mechanical Engineering, South-Tehran – Azad University (Iran), 2000
Capstone Project: *Design and Optimization of a thermal solar energy system*

PROFESSIONAL APPOINTMENTS

- **Interim Director**, Timken Foundation Center for Precision Manufacturing (an industry-driven center for research & workforce development) (March 2021– Present) https://cpm.uakron.edu/
- **Co-Director**, Manufacturing Graduate Certificate Program (Fall 2022– Present) www.uakron.edu/engineering/me/manufacturing-graduate-certificate-program
- **Associate Professor**, Mechanical Engineering Dept., University of Akron (2019 – Present)
- **Assistant Professor**, Mechanical Engineering Dept., University of Akron (2013 – 2019)
- **ASME Committee Member for Codes/Standards Development**, PTC-53 (2015 – Present)
- **ASEE Officer**, Mechanical Engineering Division (June 2021 – Present); Manufacturing Division (2019 – Present); Energy Conversion & Conservation Division (2017 – 2022)
- **Adjunct Professor,** Department of Mechanical & Mechatronics Engineering, and Department of Chemical Engineering, University of Waterloo, Canada (2014 – 2019)
- **Post-Doctoral Fellow**, Applied Nanomaterials & Clean Energy Lab., and Electrochemical Power Sources Lab., Worked on General Motors (GM) Electric Vehicle project, University of Waterloo, Canada (2012 – 2013)
- **Visiting Researcher**, National Research Council Canada (NRC), Institute for Chemical Process and Environmental Technology (ICPET), Ottawa, Canada (2008 – 2010).
- **Mechanical Engineer**, Hirbodan Oil & Gas and Power plant EPC Company, Iran (2003 – 2006)
- **Research Associate,** Energy Research Center, Amirkabir University, Iran (2002 – 2003)
- **Mechanical Engineer**, Vehicle Standard & Quality Inspection Institute, Iran (2001 – 2002)

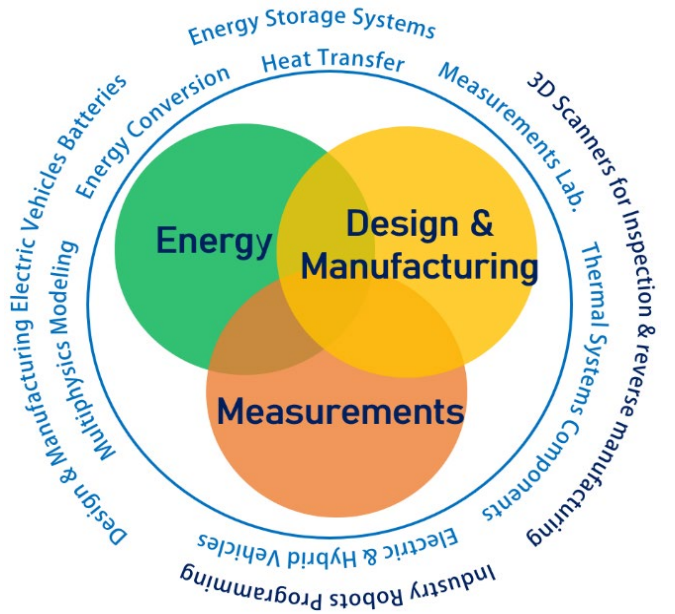
RESEARCH SUMMARY

My research fields are Energy and Manufacturing, both modeling and experimental for applications in electric vehicles & aircraft, battery manufacturing, sensor manufacturing, space manufacturing, and recently, ceramics grinding for aircraft engine bearings, electronic chips, etc. My focus in the field of energy is on energy conversion and storage with emphasis on batteries, fuel cells, and piezoelectrics; and covers the entire spectrum from materials development to system development and recycling. My focus in the field of Manufacturing is on precision finishing technologies (such as grinding) and Industry 4.0 for precision finishing. Most of my research activities are interdisciplinary and are linked to nanotechnology, electrochemistry, thermal science, materials science, and AI/machine learning.



TEACHING SUMMARY

My teaching activities are in the fields of Energy, Measurements/sensors, and Design & Manufacturing. The courses that I taught are: "Heat Transfer," "Energy Conversion," "Measurements Laboratory," "Thermal systems Components," "Multiphysics Modeling of Engineering Systems," "Energy Storage Systems," "Electric & Hybrid Vehicles," "Experimental Investigation in Mechanical Engineering," and "Design & Manufacturing Electric Vehicles Batteries." The short courses that I offered are "3D Scanners for Inspection and reverse manufacturing," and "Industry Robots Programming." I have supervised 30+ design and manufacturing capstone projects since 2012. Because of my close tie with ASEE and Industry, I cover several useful topics in my courses, such as sustainably, reduction of greenhouse gases, engineering codes and standards, related engineering software, and AI & machine learning to prepare the next generation of engineers for current and future needs of industry and society.



SERVICE SUMMARY

My service activities at university fall into four main categories "serving as director & manager," "serving as an advisor," and "serving in committees." Serving as director & manager include "Interim director for Center for Precision Manufacturing," and "Manager for Measurements educational

laboratory." Serving as an advisor includes "Advisor for undergraduate students," and "Advisor for SAE Electric Formula students design team." Serving in committees include "Committee chair for development of manufacturing graduate certificate program," "Committee chair for faculty Retention, Tenure and Promotion (RTP)," "Committee chair for updating the department RTP guideline," "Committee chair for updating graduate core courses," "Committee chair/member for several faculty and technicians hiring," "Committee chair/member for several Ph.D. dissertations and MSc theses," and "Committee member for graduate/undergraduate students' awards."

My service activities outside the university fall into two main categories serving as a peer reviewer/editor and serving in communities. Serving as a peer reviewer/editor includes "NSF panelist," "Proposal reviewer," "Journal/conference manuscript reviewer," and "Guest editor for Energies journal." Serving in communities include "ASEE officer in 3 divisions," "ASME committee for code/standard development," "organizer, technical chair, session chair, session moderator, and panel moderator in several conferences," and "Member of ASME (lifetime member), ASEE, etc."

TEACHING EXPERIENCE

Undergraduate Level:

MECE–315: Heat Transfer

Spring 2014, Fall 2014, Fall 2015, Summer 2020. Summer 2021, Summer 2022

MECE–483: Measurements Lab.

Fall 2014, Spring 2014, Spring 2015, Spring 2016, Fall 2016, Spring 2017, Fall 2017, Spring 2018, Fall 2018, Spring 2019, Fall 2019, Spring 2020, Fall 2020, Spring 2021, Summer 2021, Fall 2021, Spring 2022, Summer 2022.

MECE–498: Experimental Investigation in Mechanical Engineering

Summer 2017

MECE–400: Thermal Systems Components

Spring 2015, Summer 2020.

Graduate Level:

MECE–696–602: Energy Storage Systems

Spring 2016

MECE–696–402: Electric & Hybrid Vehicles

Summer 2016

MECE–696–806: EV Battery Design and Manufacturing

Spring 2022

Dual-Level:

MECE–486/696: Multiphysics Modeling

Spring 2015, Fall 2017, Fall 2019, Fall 2021.

MECE–415/515: Energy Conversion

Fall 2018, Fall 2020.

HONORS AND AWARDS

1. Breakthrough Research Project - National Science Foundation (NSF) (iucrc.nsf.gov/centers/achievements/test-helps-rubber-meet-the-road), 2020.
2. Best Presentation Award (1st place), CenTiRe, Virginia Tech, Blacksburg, Virginia, 2019.
3. Top downloaded paper, Wiley, 2018-19
4. Best Paper Award (1st place), ASME Energy Sustainability Conference, Florida, 2018.
5. Five-Year Service Award, University of Akron, 2018.
6. Best (1st place) Undergraduate Capstone Project Awards, U. of Akron (2016, 2017).
7. Industrial Fellowship, NSERC (Natural Sciences & Eng. Research Council) Canada, 2013.
8. Strategic Post-Doctoral Fellowship Award, MITACS Elevate, 2012.
9. Best Idea Award (1st place), Toyota Motor Manufacturing Canada (TMMC), 2010.
10. Best Poster Award (1st place), Fuel Cell Research and Development Network, University of Ontario Institute of Technology (UOIT), 2011.
11. Three Ph.D. student awards from the University of Waterloo for research activities (2009, 2010, 2011).
12. Best MSc Thesis Award (1st place), Countrywide Competition, Iranian Society of Mechanical Engineers, 2002.

PROFESSIONAL ACTIVITIES

1. Collaborated for the establishment of a new Industry-Driven "Research" and "Workforce Development" Center for Precision Manufacturing, University of Akron (2016 – 2021).
2. Development of a new Graduate Manufacturing Certificate Program (Fall 2022).
3. Advisor – SAE Electric Formula Students' Design Team, University of Akron (2015–2019).
4. Advisor for Undergraduate Students of Mechanical and Aerospace Engineering, University of Akron (2014 – Present)
5. Students Recruitment activities, University of Akron (2014- Present).
6. Committee Chair – Hiring Tenure-Track Faculty for Center for Precision Manufacturing, Department of Mechanical Engineering, University of Akron (Fall 2022).
7. Committee Member – Hiring Non-Tenure-Track Faculty, Department of Mechanical Engineering, University of Akron (Spring 2021).
8. Committee Member – Hiring Non-Tenure-Track Faculty, Department of Mechanical Engineering, University of Akron (Summer 2021).
9. Committee Member – Updating Graduate Core Courses, Department of Mechanical Engineering, University of Akron (Summer 2019).
10. Committee Member – Hiring Engineering Technician Senior (Instrumentation), Department of Mechanical Engineering, University of Akron (Fall 2021).
11. Committee Chair – Hiring Engineering Technician Senior (Instrumentation), Department of Mechanical Engineering, University of Akron (Fall 2019).
12. Committee Member – Hiring Engineering Technician Senior (Manufacturing), Department of Mechanical Engineering, University of Akron (Spring 2019).
13. Committee Chair – Updating RTP guideline, Department of Mechanical Engineering, University of

Akron (2020-21).

14. Committee Member – ASME Code/Standard Development, PTC 53: Mechanical and Thermal Energy Storage Systems (2015-Present)
15. ASEE Officer, Mechanical Engineering Division (2022-23: Program Chair-Elect, 2021-22: Treasurer & Secretary)
16. ASEE Officer, Manufacturing Division (2022-23: Program Chair, 2021-22: Assistant Program Chair and Treasurer; 2020-2021: Secretary; 2019-20: Secretary)
17. ASEE Officer, Energy Conversion & Conservation Division (2022-23: Division Past Chair, 2021-22: Division Chair; 2020-21: Vice Chair; 2019-20: Program Chair; 2018-19: Treasurer & Secretary; 2017-18: Newsletter Editor)
18. Purchased advanced manufacturing equipment for the Department of Mechanical Engineering and the Center for Precision Manufacturing including manufacturing robots, carbon fiber and composite 3D printer, color 3D printer, metal 3D printer, and 3D scanners.
19. Preparation of educational videos for students for 3D scanner, metal 3D printer, and color 3D printer. (2020, 2021)
20. Application Evaluator for Graduate School, University of Akron (Summer 2020 – Present).
21. RTP Committee Chair for evaluation of four faculty members, Department of Mechanical Engineering, University of Akron (2020-21).
22. Committee Member – Several PhD proposals/dissertations and MSc thesis (2014 – Present).
23. Involved in document preparation for ABET evaluations (2014 – Present).
24. Referee for College of Engineering Trajectory Award (Spring 2020)
25. Contributed to Qualifying Exam for PhD students (Fall 2015, Fall 2016, Fall 2017, Spring 2021, Spring 2022)
26. Manager of Advanced Energy & Manufacturing Research Laboratory (AEML), Engineering Research Center, University of Akron (2014–Present).
27. Manager of the Measurements Educational Laboratory (2014–Present).
28. <u>Conference / Workshop Organizer:</u>
    - Session Chair – ASEE Conference in Minneapolis, MN, Session M1777: ECCNE Division – Enhancing Energy-Related Education with Student Design Projects, 2022.
    - Organized Workshop – Training employees of the manufacturing industry, faculty, and students for inspection and reverse engineering using metrology-grade 3D scanners, October 2021.
    - Session Chair – ASEE's Virtual Conference, Session M416: ECC Division – Mechanical and CAD Track, 2021.
    - Panel Chair – SAE Virtual Conference, Session WCX502: Advanced Battery Technologies, 2020.
    - Program Chair – ASEE's Virtual Conference, Energy Conversion and Conservation Division, 2020.
    - Session Chair – ASEE's Virtual Conference, Session T416: ECC and Manufacturing Divisions – NSF Guest Speaker Session, 2020.
    - Session Chair – ASEE's Virtual Conference, Session M416: Innovations in Energy, Environmental, and Engineering Education, 2020.
    - Session Chair – ASEE's Virtual Conference, Session W716: Virtual Tour – Energy Facilities, 2020.
    - Session Chair – ASEE Conference, Session T116: Energy Efficiency and Power Grid Security

(Salt Lake City, Utah 2018).

- Track Chair – ASME Power & Energy Conference, Track 4-4: Thermal Energy Storage Systems (Charlotte, NC 2017).
- Session Chair – ASME Power & Energy Conference, Session 4-4-2: Thermal Energy Storage Systems II: Systems (Charlotte, NC 2017).
- Organizing Committee – Recent Advances in Fuel cells (Ontario, Canada 2011 and 2012).
- Organizing Committee – Networking Event in Applications of Micro/Nano Technologies (Ontario, Canada 2012).
- Organizing Committee – Summer Course, "Exergy and Its Applications for Better Environment and Sustainability" (UOIT, Ontario, Canada 2012).

29. Proposal Review / Panelist
    - Panelist: ESF (European Science Foundation) (February 2022)
    - Panelist: NSF – CBET Program – Energy for Sustainability (Spring 2018)
    - Proposal Review – Research Foundation, University of Wisconsin-Milwaukee (Spring 2019)
    - Proposal Review – Research Growth Initiative (RGI), University of Wisconsin-Milwaukee (Fall 2018)
    - Book Proposal Review: Degradation, health monitoring, and prediction of lithium-ion batteries for EV application, Publisher: Elsevier, May 2022.
    - Book Proposal Review: Multifunctional Coordinated Materials for Green Energy Technologies, Publisher: CRC Press/Taylor & Francis, April 2022.
    - Book Proposal Review: Graphene-Metal Oxide Composites Synthesis, Properties, and Applications, Publisher: Royal Society of Chemistry, December 2021.
    - Book Proposal Review: Smart Lighting: From Light Pollution to Nature Light, Publisher: CRC Press, December 2020.
    - Research Proposal Review – MITACS Program (2013)

30. Reviewer – Journals & Conferences

    AI Energy; Journal of Power Sources; International Journal of Hydrogen Energy; Applied Energy; Fuel Cell; International Journal of Energy Research; Electrochimica Acta; Applied Thermal Engineering; Environmental Impact Assessment Review; AIChE; Journal of Energy Storage; Ceramics International; ASME Journal of Electrochemical Energy Conversion and Storage, Energies; ASEE conferences, ASME Conferences, SAE Conferences, etc.

31. Editor – Discover Energy journal, Springer Nature (Fall 2022-Present)

32. Guest Editor – Energies Journal, Special Issue "Recycling, Regeneration, and Reusing of Lithium-Ion Batteries" (2020-21)

33. Guest Editor – Energies Journal, Special Issue "Lithium-Ion Batteries: Latest Advances, Challenges and Prospects" (2021-22)

JOURNAL PUBLICATIONS

58. H. Khatibi, E. Hassan, D. Frisone, M. Amiriyan, R. Farahati, **S. Farhad**, **Recycling and Reusing Copper and Aluminum Current-Collectors from Spent Lithium-Ion Batteries**, Energies 15(23):9069, 2022.
57. O.M. Ayoola, A. Buldum, **S. Farhad**, S.A. Ojo, **A Review on the Molecular Modeling of Argyrodite Electrolytes for All-Solid-State Lithium Batteries**, *Energies, 15(19):7288,* 2022.

56. M. Kelly, **S. Farhad, Simplified mathematical modeling and parametric study on friction coefficient of rubber materials for vehicle's tire application,** *Polymer Engineering and Science*, 2022.
55. M. Alhadri, W. Zakri, **S. Farhad, Study on Integration of Retired Lithium-Ion Battery with Photovoltaic for Net-Zero Electricity Residential Homes,** *ASME Journal of Solar Energy Engineering*, 145(2):21011, 2022.
54. H. Barua, M. Younessi-Sinaki, and **S. Farhad**, **Study on Geothermal Heat Exchangers with Nanofluids Containing Ceramic Nanoparticles**, *Journal of Thermal Science and Engineering Applications*, 15(1):11008, 2022.
53. W. Zakri, H. Fagehi, M. Alhadri, A. Abutaleb, **S. Farhad**, **Three-dimensional Heterogeneous Modeling of a Flexible Lithium-ion Battery Made from Semi-Solid Electrodes**, *Journal of Electrochemical Energy Conversion and Storage*, 20(2):21007, 2022.
52. E. Hassan, M. Amiriyan, D. Frisone, J. Dunham, R. Farahati, and **S. Farhad**, **Effects of Coating on the Electrochemical Performance of a Nickel-Rich Cathode Active Material**, *Energies*, 15:4886, 2022.
51. I. Kay, **S. Farhad**, A. Mahajan, R. Esmaeeli, and S.R. Hashemi, **Robotic Disassembly of Electric Vehicles' Battery Modules for Recycling**, *Energies*, 15:4856, 2022.
50. N.G. Garafolo, **S. Farhad**, M.V. Koricherla, S. Wen, and R. Esmaeeli, **Modal Analysis of a Lithium-Ion Battery for Electric Vehicles**, *Energies*, 15:4841, 2022.
49. E. Hamidi-Asl, L. Heidari, J.B. Raoof, T.P. Richard, **S. Farhad**, M. Ghani, **A Review on the Recent Achievements on Coronaviruses Recognition Using Electrochemical Detection Methods**, *Microchemical Journal*, 178:107322, 2022.
48. H. Al-Shammari, **S. Farhad**, **Performance of Cathodes Fabricated from Mixture of Active Materials Obtained from Recycled Lithium-Ion Batteries,** *Energies,* 15(2):410, 2022.
47. S.R. Hashemi, A. Bahadoran Baghbadorani, R. Esmaeeli, A. Mahajan, **S. Farhad**, **Machine Learning-based Model for Lithium-ion Batteries in BMS of Electric/Hybrid Electric Aircraft,** *International Journal of Energy Research,* 45(4):5747, 2021.
46. S.R. Hashemi, A.M. Mahajan, **S. Farhad**, **Online Estimation of Battery Model Parameters and State of Health in Electric and Hybrid Aircraft Application,** *Energy,* 229:120699, 2021.
45. H. Al-Shammari, **S. Farhad**, **Heavy Liquids for Rapid Separation of Cathode and Anode Active Materials from Recycled Lithium-Ion Batteries,** *Resources, Conservation and Recycling,* 174:105749, 2021.
44. H. Ilkhani, N. Hedayat, **S. Farhad, Novel Approaches for Rapid Detection of COVID-19 During the Pandemic: A Review,** *Analytical Biochemistry*, 634:114362, 2021.
43. R. Esmaeeli, **S. Farhad**, **Parameters Estimation of Generalized Maxwell Model for SBR and Carbon-filled SBR using a Direct High-Frequency DMA Measurement System**, *Mechanics of Materials,* 146:103369, 2020.
42. R. Esmaeeli, T. Tada, **S. Farhad**, **A New High Frequency Dynamic Mechanical Analysis System: An Approach to Direct High Frequency Testing of Tire Tread Rubber,** *Polymer Testing,* 86:106491, 2020.
41. S.R. Hashemi, R. Esmaeeli, A. Nazari, H. Aliniagerdroudbari, M. Alhadri, W. Zakri, A.H. Mohammed, A. Mahajan, **S. Farhad**, **A Fast Diagnosis Methodology for Typical Faults of a Lithium-Ion Battery in Electric and Hybrid Electric Aircraft**, *ASME Journal of Electrochemical Energy Conversion and Storage,* 17(1): 2020.
40. A.H Mohammed, R. Esmaeeli, H. Aliniagerdroudbari, M. Alhadri, S.R. Hashemi, G. Nadkarni, and **S. Farhad**, **Dual-Purpose Cooling Plate for Thermal Management of Prismatic Lithium-Ion**

Batteries During Normal Operation and Thermal Runaway, *Applied Thermal Engineering,* 160: 114106, 2019.

39. R. Esmaeeli, H. Aliniagerdroudbari, S.R. Hashemi, A. Nazari, M. Alhadri, W. Zakri, A.H. Mohammed, C. Batur and **S. Farhad**, **A Rainbow Piezoelectric Energy Harvesting System for Intelligent Tire Monitoring Applications**, *Journal of Energy Resources Technology,* 141(6):062007, 2019.

38. **S. Farhad**, A. Nazari; **Introducing the Energy Efficiency Map of Lithium-ion Batteries**, *International Journal of Energy Research,* 43(2):931-944, 2019.

37. M.S. Herdem, M. Mundhwa, **S. Farhad**, F. Hamdullahpur, **Catalyst Layer Design and Arrangement to Improve the Performance of a Microchannel Methanol Steam Reformer**, *Energy Conversion and Management,* 180:149-161, 2019.

36. M.S. Herdem, M. Younessi Sinaki, **S. Farhad**, F. Hamdullahpur, **An Overview of the Methanol Reforming Process: Comparison of Fuels, Catalysts, Reformers, and Systems**, *International Journal of Energy Research,* 43(10):5076-5105, 2019.

35. R. Esmaeeli, H. Aliniagerdroudbari, S.R. Hashemi, M. Alhadri, W. Zakri, C. Batur, **S. Farhad**, **Design, Modeling, and Analysis of a High Performance Piezoelectric Energy Harvester for Intelligent Tires**, *International Journal of Energy Research,* 1-14, 2019.

34. R. Esmaeeli, H. Aliniagerdroudbari, S.R. Hashemi, C. JBR, and **S. Farhad**, **Designing a New Dynamic Mechanical Analysis (DMA) System for Testing Viscoelastic Materials at High Frequencies**, *Modelling and Simulation in Engineering,* 2019.

33. M.S. Herdem, M. Mundhwa, **S. Farhad**, F. Hamdullahpur, **Multiphysics Modeling and Heat Distribution Study in a Catalytic Microchannel Methanol Steam Reformer**, Energy & Fuels, 32: 7220-7234, 2018.

32. H. Ilkhani, **S. Farhad**, **A Novel Electrochemical DNA Biosensor for Ebola Virus Detection**, *Analytical Biochemistry*, 557:151-155, 2018.

31. M. Mastali, E. Foreman, A. Modjtahedi, E. Samadani, A. Amirfazli, **S. Farhad**, R. Fraser, M. Fowler, **Electrochemical-Thermal Modeling and Experimental Validation of Commercial Graphite/$LiFePO_4$ Pouch Lithium-Ion Batteries**, *International Journal of Thermal Sciences,* 129: 218-230, 2018.

30. E. Foremen, W. Zakri, M.H. Sanatimoghaddam, A. Modjtahedi, S. Pathak, N.G. Garafolo, **S. Farhad**, **A Review of Inactive Materials and Components of Flexible Lithium-Ion Batteries**, *Advanced Sustainable Systems,* 1(11): 2017.

29. A.Ghorbani Kashkooli, E. Foreman, **S. Farhad**, D. Un Lee, W. Ahn, K. Feng, V. De Andrade, Z. Chen, **Morphological and Electrochemical Characterization of a Nanostructure $Li_4Ti_5O_{12}$ Electrode Using Multiple Imaging Mode Synchrotron X-ray Computed Tomography**, *Journal of The Electrochemical Society,* 164(12):A2861-A2871, 2017.

28. A. Nazari, **S. Farhad**, **Effects of Nominal Capacity and Electrode Materials on Heat Generation in Lithium-ion Batteries**, *Applied Thermal Engineering,* 125:1501-1517, 2017.

27. A. Ghorbani Kashkooli, E. Foreman, **S. Farhad**, D. Un Lee, W. Ahn, K. Feng, V. De Andrade, Z. Chen, **Synchrotron X-ray Nano Computed Tomography Based Simulation of Stress Evolution in $LiMn_2O_4$ Electrodes**, *Electrochimica Acta,* 247:1103-1116, 2017.

26. A.G. Kashkooli, A. Amirfazli, **S. Farhad**, D.U. Lee, S. Felicelli, H.W. Park, K. Feng, V.D Andrade, Z. Chen, **Representative Volume Element Model of Lithium-ion Battery Electrodes Based on X-ray Nano-tomography**, *Journal of Applied Electrochemistry*, 47(3):281-293, 2017.

25. M. Mastali, M. Farkhondeh, **S. Farhad**, R.A. Fraser, Michael Fowler, **Electrochemical Modeling of Commercial $LiFePO_4$ and Graphite Electrodes: Kinetic and Transport Properties and Their Temperature Dependence**, *Journal of The Electrochemical Society,* 163(13):A2803-A2816, 2016.

24. A. Modjtahedi, A. Amirfazli, **S. Farhad**. **Low Catalyst Loaded Ethanol Gas Fuel Cell Sensor**. Sensors & Actuators B: Chemical. 234:70–79, 2016.

23. M. Mastali, E. Samadani, **S. Farhad**, R. Fraser, M. Fowler. **Three-dimensional Multi-Particle Electrochemical Model of $LiFePO_4$ Cells based on a Resistor Network Methodology**. *Electrochimica Acta*. 190:574-587, 2016.

22. A.G. Kashkooli, G. Lui, **S. Farhad**, D.U. Lee, K. Feng, A. Yu, Z. Chen. **Nano-particle Size Effect on the Performance of $Li_4Ti_5O_{12}$ Spinel**, *Electrochimica Acta.* 196:33-40, 2016.

21. A.G. Kashkooli, **S. Farhad**, D.U Lee, K. Feng, S. Litster, S.K. Babu, L. Zhu, Z. Chen. **Multiscale Modeling of Lithium-ion Battery Electrodes based on Nano-scale X-ray Computed Tomography**, *Journal of Power Sources.* 307:496-509, 2016.

20. E. Samadani, M. Mastali, **S. Farhad**, R.A. Fraser, M. Fowler. **Li-ion Battery Performance and Degradation in Electric Vehicles under Different Usage Scenarios**, *International Journal of Energy Research*. 40:379-392, 2016.

19. M.S. Herdem, **S. Farhad,** F. Hamdullahpur. **Modeling and Parametric Study of a Methanol Reformate Gas-fueled HT-PEMFC System for Portable Power Generation Applications**, *Journal of Energy Conversion and Management.* 101:19-29, 2015.

18. E. Samadani, **S. Farhad**, W. Scott, M. Mastali, L.E. Gimenez, M. Fowler, R.A. Fraser. **Empirical Modeling of Lithium-ion Batteries Based on Electrochemical Impedance Spectroscopy Tests.** *Electrochimica Acta*. 160:169-177, 2015.

17. M. Majdabadi, **S. Farhad**, M. Farkhondeh, R. Fraser, M. Fowler. **Simplified Electrochemical Multi-particle Model for $LiFePO_4$ Cathodes in Lithium-ion Batteries.** *Journal of Power Sources.* 275:633-643, 2015.

16. A. Ghorbani Kashkooli, **S. Farhad**, V. Chabot, A. Yu, Z. Chen. **Effects of Structural Design on the Performance of Electrical Double Layer Capacitors.** *Applied Energy*. 138:631-639, 2015.

15. H. Zarrin, **S. Farhad**, F. Hamdullahpur, V. Chabot, A. Yu, M. Fowler, Z. Chen. **Effects of Diffusive Charge Transfer and Salt Concentration Gradient in Electrolyte on Li-ion Battery Energy and Power Densities.** *Electrochimica Acta*. 125:117-123, 2014.

14. M.S. Herdem, **S. Farhad**, I. Dincer, F. Hamdullahpur. **Thermodynamic Modeling and Assessment of a Combined Coal Gasification and Alkaline Water Electrolysis System for Hydrogen Production.** *International Journal of Hydrogen Energy*. 39:3061-3071, 2014.

13. V. Chabot, **S. Farhad**, Z. Chen, A.S. Fung, A. Yu, F. Hamdullahpur. **Effect of Electrodes Physical and Chemical Properties on Lithium-ion Battery Performance.** *International Journal of Energy Research.* 37(14):1723-1736, 2013.

12. A. Ghorbani Kashkooli, **S. Farhad**, A.S. Fung, Z. Chen. **Effect of Convective Mass Transfer on Lead-acid Battery Performance.** *Electrochimica Acta.* 97:278-288, 2013.

11. **S. Farhad**, F. Hamdullahpur. **Effect of Composite Electrode Microstructure on Temperature Distribution in Solid Oxide Fuel Cells.** *Electrochimica Acta.* 99: 9– 14, 2013.

10. **S. Farhad**, F. Hamdullahpur. **Minimization of Polarization Resistance in Solid Oxide Fuel Cells by Proper Design of Micro-/ Nano-structure of Porous Composite Electrodes.** *Electrochimica Acta*. 61: 1–12, 2012.

9. **S. Farhad**, F. Hamdullahpur. **Optimization of the Microstructure of Porous Composite Cathodes in Solid Oxide Fuel Cells.** *AIChE Journal*. 58(4):1248–1261, 2012.

8. **S. Farhad**, F. Hamdullahpur. **Micro-modeling of Porous Composite Anodes for Solid Oxide Fuel Cells.** *AIChE Journal*. 58(6):1893–1906, 2011.

7. **S. Farhad**, Y. Yoo, F. Hamdullahpur. **Performance Evaluation of Different Configurations of Biogas-fuelled SOFC Micro-CHP Systems for Residential Applications.** *International Journal of Hydrogen Energy*. 35(8):3758–3768, 2010.

6. **S. Farhad**, F. Hamdullahpur. **Conceptual Design of a Novel Ammonia–fuelled Portable Solid Oxide Fuel Cell System.** *Journal of Power Sources*. 195:3084–3090, 2010.

5. **S. Farhad**, Y. Yoo, F. Hamdullahpur. **Effects of Fuel Processing Methods on Industrial Scale Biogas–fuelled SOFC System for Operating in Wastewater Treatment Plants.** *Journal of Power Sources*. 195:1446–1453, 2010.

4. **S. Farhad**, F. Hamdullahpur. **Developing Fuel Map to Predict the Effect of Fuel Composition on the Maximum Efficiency of Solid Oxide Fuel Cells.** *Journal of Power Sources*. 193(2):632–638, 2009.

3. **S. Farhad**, F. Hamdullahpur. **Developing Fuel Map to Predict the Effect of Fuel Composition on the Maximum Voltage of Solid Oxide Fuel Cells.** *Journal of Power Sources*. 191(2):407–416, 2009.

2. **S. Farhad**, M. Younessi, M. R. Golriz, F. Hamdullahpur. **Exergy Analysis and Performance Evaluation of CNG to LNG Converting Process.** *International Journal of Exergy*. 5(2):164–176, 2008.

1. **S. Farhad**, M. Saffar-Avval, M. Younessi-Sinaki. **Efficient Design of Feedwater Heaters Network in Steam Power Plants Using Pinch Technology and Exergy Analysis.** *International Journal of Energy Research*. 32:1–11, 2008.

CONFERENCE PAPERS (REFREED AND PUBLISHED IN PROCEDING)

44. D. Frisone, M. Amiriyan, E. Hassan, J. Dunham, R. Farahati, **S. Farhad**, **Effect of $LiNbO_3$ Coating on Capacity and Cycling of Nickel-Rich NMC Cathode Active Material**, *Proceeding of the ASME 2021, International Mechanical Engineering Congress and Exposition (IMECE),* Virtual Conference, doi.org/10.1115/IMECE2021-73728, November 2021.

43. J. Dunham, D. Frisone, M. Amiriyan, E. Hassan, J. Feng Hu, R. Farahati, **S. Farhad**, **Effect of Pressure and Temperature on the Performance of Argyrodite $Li_6PS_5Cl_{0.5}Br_{0.5}$ Electrolyte for All-Solid-State Lithium Battery**, *Proceeding of the ASME 2021, International Mechanical Engineering Congress and Exposition (IMECE),* Virtual Conference, doi.org/10.1115/IMECE2021-73735, November 2021.

42. M. Alhadri, W. Zakri, **S. Farhad**, **Second-Life Analysis of Lithium-Ion Battery in a Residential Solar Photovoltaic Grid-Tied System**, *Proceeding of the ASME 2021, International Mechanical Engineering Congress and Exposition (IMECE),* Virtual Conference, doi.org/10.1115/IMECE2021-73403, November 2021.

41. W. Zakri, H. Fagehi, M. Alhadri, A. Abutaleb, **S. Farhad**, **Mathematical Modelling of Semi-Solid Electrodes for Flexible Lithium-Ion Batteries**, *Proceeding of the ASME 2021, International Mechanical Engineering Congress and Exposition (IMECE),* Virtual Conference, doi.org/10.1115/IMECE2021-73345, November 2021.

40. H. Barua, M. Younessi Sinaki, **S. Farhad**, **Geothermal Heat Exchanger Performance With Nanofluids Containing Ceramic MgO and Al_2O_3 Particles**, *Proceeding of the ASME 2021, International Mechanical Engineering Congress and Exposition (IMECE),* Virtual Conference, doi.org/10.1115/IMECE2021-73370, November 2021.

39. H. Aliniagerdroudbari, R. Esmaeeli, **S. Farhad**, **Experimental Study of a Piezoelectric Strain-Based Energy Harvester for Intelligent Tires of Autonomous Vehicles**, *Proceeding of the ASME 2021, International Mechanical Engineering Congress and Exposition (IMECE),* Virtual Conference, doi.org/10.1115/IMECE2021-73353, November 2021.

38. M. Alhadri, W. Zakri, R. Esmaeeli, **S. Farhad**, **A Study on Degradation of Lithium-Ion Batteries for Aircraft Applications**, *Proceeding of the ASME 2021, International Mechanical Engineering Congress and Exposition (IMECE),* Virtual Conference, doi.org/10.1115/IMECE2021-73606, November 2021.

37. S. Rashidi, A. Zandiatashbar, **S. Farhad**, **Study of Defect Morphology and Density on Mechano-Electrochemical Effect of Pipeline Corrosion**, *Proceeding of the ASME 2021, International Mechanical Engineering Congress and Exposition (IMECE),* Virtual Conference, doi.org/10.1115/IMECE2021-73358, November 2021.

36. H. Al-Shammari, **S. Farhad**, **Regeneration of Cathode Mixture Active Materials Obtained from Recycling Lithium Ion Batteries***, SAE Technical Paper,* doi.org/10.4271/2020-01-0864, June 2020.

35. H. Al-Shammari, R. Esmaeeli, H. Aliniagerdroudbari, M. Alhadri, S.R. Hashemi, H. Zarrin, **S. Farhad**, **Recycling Lithium-Ion Battery: Mechanical Separation of Mixed Cathode Active Materials**, *Proceeding of the ASME 2019, International Mechanical Engineering Congress and Exposition (IMECE),* Salt Lake City, UT, USA, November 2019.

34. I. Kay, R. Esmaeeli, S.R. Hashemi, A. Mahajan, **S. Farhad**, **Recycling Li-ion Batteries: Robot Disassembly of Electric Vehicle Battery Systems**, *Proceeding of the ASME 2019, International Mechanical Engineering Congress and Exposition (IMECE),* Salt Lake City, UT, USA, November 2019.

33. S.R. Hashemi, R. Esmaeeli, H. Aliniagerdroudbari, M. Alhadri, H. Al-Shammari, A. Mahajan, **S. Farhad**, **New Intelligent Battery Management System for Drones**, *Proceeding of the ASME 2019, International Mechanical Engineering Congress and Exposition (IMECE),* Salt Lake City, UT, USA, November 2019.

32. R. Esmaeeli, H. Aliniagerdroudbari, S.R. Hashemi, H. Al-Shammari, M. Alhadri, **S. Farhad**, **Univariate and Multivariate Gauge Repeatability and Reproducibility Analysis on the High Frequency Dynamic Mechanical Analysis (DMA) Measurement System**, *Proceeding of the ASME 2019, International Mechanical Engineering Congress and Exposition (IMECE),* Salt Lake City, UT, USA, November 2019.

31. M. Alhadri, W. Zakri, R. Esmaeeli, A.H. Mohammed, S.R. Hashemi, H. Barua, H. Aliniagerdroudbari, **S. Farhad**, **Analysis of Second-Life of a Lithium-Ion Battery in an Energy Storage System Connected to a Wind Turbine**, *IEEE Power and Energy Conference,* Champaign, Illinois, DOI: 10.1109/PECI.2019.8698782, 2019.

30. H. Aliniagerdroudbari, R. Esmaeeli, S.R. Hashemi, M. Alhadri, W. Zakri, **S. Farhad**, **A Piezoelectric Sandwich Structure for Harvesting Energy from Tire Strain to Power up Intelligent Tire Sensors**, *IEEE Power and Energy Conference,* Champaign, Illinois, DOI: 10.1109/PECI.2019.8698908, 2019.

29. **S. Farhad**, D. Kandray, and M. Younessi Sinaki, **Undergraduate Students' Research on Energy Saving in Industrial Robots: Effect of Regular and Irregular Meetings on Deductive Research**, *ASEE Annual Conference, Paper ID # 26532*, Tampa, Florida, 2019.

28. A. Nazari, R. Esmaeeli, S. R. Hashemi, H. Aliniagerdroudbari, and **S. Farhad**, **Low-Temperature Energy Efficiency of Lithium-ion Batteries**, *ASME IMECE,* Pittsburgh, PA, United States, 2018.

27. R. Esmaeeli, A. Nazari, H. Aliniagerdroudbaria, S.R. Hashemi, M. Alhadria, W. Zakri, **S. Farhad**, **Heat Built up During Dynamic Mechanical Analysis (DMA) Testing of Rubber Specimens**, *ASME IMECE,* Pittsburgh, PA, United States, 2018.

26. R. Esmaeeli, H. Aliniagerdroudbari, S.R. Hashemi, M. Alhadri, W. Zakri, C. Batur, **S. Farhad**, **Strain-Driven Piezoelectric Energy Harvester for Intelligent Tires**, *7th Global Conference on Global Warming (GCGW*), Izmir, Turkey, 2018.

25. M. Alhadri, R. Esmaeeli, A.H. Mohammed, W. Zakri, S.R. Hashemi, H. Aliniagerdroudbari, H. Barua, **S. Farhad**. **Studying the Degradation of Lithium-Ion Batteries Using an Empirical Model for Aircraft Applications**. *ASME Power & Energy Conference*, Lake Buena, Florida, United States, June 25-27, 2018.

24. W. Zakri, M. Alhadri, A.H. Mohammed, R. Esmaeeli, S.R. Hashemi, H. Aliniagerdroudbari, **S. Farhad**. **Quasi-Solid Graphite Anode for Flexible Lithium-ion Battery**. *ASME Power & Energy Conference*, Lake Buena, Florida, United States, June 25-27, 2018.

23. S.R. Hashemi, A. Nazari, R. Esmaeeli, H. Aliniagerdroudbari, M. Alhadri, W. Zakri, A.H. Mohammed, A. Mahajan, **S. Farhad**. **Fast Fault Diagnosis of a Lithium-ion Battery for Hybrid Electric Aircraft**. *ASME Power & Energy Conference*, Lake Buena, Florida, United States, June 25-27, 2018.

22. A. Nazari, R. Esmaeeli, S.R. Hashemi, H. Aliniagerdroudbari, **S. Farhad**. **The Effect of Temperature on Lithium-ion Battery Energy Efficiency with Graphite/$LiFePO_4$ Electrodes at Different Nominal Capacities**. *ASME Power & Energy Conference*, Lake Buena, Florida, United States, June 25-27, 2018.

21. R. Esmaeeli, H. Aliniagerdroudbari, A. Nazari, S.R. Hashemi, M. Alhadri, W. Zakri, A.H. Mohammed, C. Batur, **S. Farhad**. **Optimization of a Rainbow Piezoelectric Energy Harvesting System for Tire Monitoring Applications**. *ASME Power & Energy Conference*, Lake Buena, Florida, United States, June 25-27, 2018.

20. A.H. Mohammed, M. Alhadri, W. Zakri, H. Aliniagerdroudbari, R. Esmaeeli, S.R. Hashemi, G. Nadkarni, **S. Farhad**, **Design and Comparison of Cooling Plates for a Prismatic Lithium-ion Battery for Electrified Vehicles,** *SAE Technical Paper, 2018-01-1188,* https://doi.org/10.4271/2018-01-1188, 2018.

19. M. Alhadri, A.H. Mohammed, **S. Farhad, Comparison of Duty-Cycle of a Lithium-Ion Battery for Electric Airplane and Electric Vehicle Applications**, *SAE Technical Paper,* 2018-01-0666, *https://doi.org/10.4271/2018-01-0666, 2018.*

18. R. Esmaeeli, H. Aliniagerdroudbari, C.S. JBR, C. Batur, **S. Farhad**, **Designing a New Dynamic Mechanical Analysis (DMA) System for Testing Viscoelastic Materials at High Frequencies**. *36th Annual Meeting and Conference on Tire Science and Technology,* Akron, Ohio, 2017.

17. M.M.M. Kohneh, E. Samadani, **S. Farhad**, R. Fraser, M. Fowler. **Three-dimensional Electrochemical Analysis of a Graphite/$LiFePO_4$ Li-ion Cell to Improve Its Durability**. *SAE Technical Paper.* doi: doi:10.4271/2015-01-1182, 2015.

16. E. Samadani, L. Gimenez, W. Scott, **S. Farhad**, M. Fowler, R. Fraser. **Thermal Behavior of Two Commercial Li-ion Batteries for Plug-in Hybrid Electric Vehicles**. SAE Technical Paper. doi: 10.4271/2014-01-1840, 2014.

15. E. Samadani, **S. Farhad**, S. Panchal, R. Fraser, M. Fowler. **Modeling and Evaluation of Li-ion Battery Performance Based on the Electric Vehicle Field Tests.** *SAE Technical* Paper. doi: 10.4271/2014-01-1848, 2014.

14. V. Chabot, **S. Farhad**, A.S. Fung, Z. Chen, A. Yu, F. Hamdullahpur. **The Impact of Lithium Diffusivity in the Active Electrode Material on the Power and Energy Density of Lithium-ion Cells**. *223th ECS meeting, Toronto, Ontario, Canada*, 12-16 May 2013.

13. **S. Farhad**, F. Hamdullahpur. **Effect of the Microstructure of Porous Composite Electrodes on the Electric Power Density of Solid Oxide Fuel Cells.** *ASME 9th Fuel Cell Science, Engineering and Technology Conference, Washington, DC, USA*, 2011.

12. **S. Farhad**, Y. Yoo, F. Hamdullahpur. **Performance Evaluation of Different Configurations of Biogas-fuelled SOFC Micro-CHP Systems for Residential Applications**. *European Fuel Cell Forum,* Lucerne, Switzerland, 2009.

11. **S. Farhad**, Y. Yoo, F. Hamdullahpur. **Conceptual Design of Anaerobic Digestion Gas-fuelled SOFC Systems to Generate Electricity and Heat in Wastewater Treatment Plants**. *ASME-ICEPAG,* Newport Beach, California, USA, 2009.

10. **S. Farhad**, F. Hamdullahpur. **Performance Evaluation of an Ammonia Fuelled Portable SOFC System**. *IEEES* Sharjah, UAE, 2009.

9. **S. Farhad**, M. Younessi, M. Golriz, F. Hamdullahpur. **Second Law Analysis and Parametric Study of a CNG to LNG Converting Process**. *2nd International Green Energy Conference,* Canada, 2006.

8. **S. Farhad**, M. Saffar-Avval, M. Younessi-Sinaki. **Effects of Rotary Air Preheater Leakage on Steam Power Plants Performance.** *ECOS Conference,* Norway, 2005.

7. M. Younessi-Sinaki, M. Saffar-Avval, **S. Farhad**. **Dynamic Behavior of Steam Power Plants.** *ECOS Conference,* Norway, 2005.

6. **S. Farhad**, M. Younessi-Sinaki, M. Saffar-Avval. **Energy Saving in Operating Steam Power Plants Based on ASME Performance Test Codes.** *ASME Power Conference,* Chicago, USA, 2005.

5. **S. Farhad**, M. Younessi-Sinaki, A. H. Modarres. **Development of ASME Performance Test Codes for Operating Systems to Reduce Energy Consumption and Environmental Pollution**. *Kuwait International Mechanical Engineering Conference*, 2004.

4. M. Saffar-Avval, **S. Farhad**, M. Younessi-Sinaki. **Performance Evaluation of In-service Boilers based on ASME PTCs for Reduction of Fuel Consumption, Part A: Preparation for Conducting Periodic Performance Tests**. *ISME International Conference,* 2004.

3. M. Saffar-Avval, **S. Farhad**, M. Younessi-Sinaki. **Performance Evaluation of In-service Boilers based on ASME PTCs for Reduction of Fuel Consumption, Part B: Test Results.** *ISME International Conference,* 2004.

2. M. Saffar-Avval, M. Younessi-Sinaki, **S. Farhad**. **Periodic Performance Tests based on ASME PTCs for Energy Saving in Steam Turbines.** *ISME International Conference,* 2004.

1. M. Saffar-Avval, **S. Farhad**, M. Younessi-Sinaki. **Periodic Performance Tests based on ASME PTCs for Energy Saving in Gas Turbines.** *ISME International Conference,* 2004.

PATENTS

2. Dynamic Mechanical Analysis (DMA) Measurement System with an Adjustable Clamp Assembly, US Patent #: US 10,809,170 B2, Oct. 20, 2020.

1. Polymer Electrolyte Membrane Fuel Cell (PEMFC) Sensor, US Patent #: US 10,788,445 B2, Sept. 29, 2020.

BOOKS

2. R.K. Gupta, A Behera, S. Farhad, T.A. Nguyen, "Advanced Flexible Ceramics: Design, Properties, Manufacturing, and Emerging Applications," Elsevier, 2022.

1. S. Farhad, R.K. Gupta, G. Yasin, T.A. Nguyen, "Nanotechnology for Battery Recycling, Remanufacturing, and Reusing", Elsevier, ISBN-13: 978-0323911344, 2022.

BOOK CHAPTERS

3. H. Al-Shammari, S. Farhad, "Separation of Battery Nano / Micro Electrode Active Materials Using Physical Method", in *Nanotechnology for Battery Recycling, Remanufacturing, and Reusing*, Chapter 13, Edited by S. Farhad, R.K. Gupta, G. Yasin, T.A. Nguyen, Elsevier, 2022.

2. H. Al-Shammari, S. Farhad, "Effects of Imperfect Separation of Cathode Active Materials in Recycling Facilities on the Performance of Remanufactured Lithium-Ion Batteries", in *Nanotechnology for Battery Recycling, Remanufacturing, and Reusing*, Chapter 21, Edited by S. Farhad, R.K. Gupta, G. Yasin, T.A. Nguyen, Elsevier, 2022.

1. S. Farhad, "Mathematical Modeling for Charging/Discharging Processes of Batteries/Nanobatteries", in *Nanobatteries and Nanogenerators*, Chapter 3, Edited by H. Song, R. Venkatachalam, T.A. Nguyen, H.B. Wu and P. Nguyen-Tri, Elsevier, 2021.

PROFESSIONAL AFFILIATIONS & CERTIFICATES

Member of ASME (lifetime member), SAE, ASEE, and SME.

Certificates:

- ASEE, National Effective Teaching Institute (NETI)
- Fanuc Robot Programming and Robot Vision
- I-Corps NSF Innovation Corps.

RESEARCH SUPERVISION

(a) Ph.D. Students

Current:

3. Motaz Roshdy (Fall 2022 – Present) — Dissertation: Study on Machine Learning Algorithms for On-Orbit Inspection and Repair of Spacecraft

2. Dominic Frisone (Summer 2022 – Present) — Dissertation: Separation of Electrode Active Materials from Retire EV Batteries for Recycling

1. Eman Hassan (Summer 2021 – Present) — Dissertation: Synthesizing Stable Argyrodite Electrolyte in Air and at Interface of Lithium and Nickle-rich NMC Cathode

Graduated:

8. Haniph Aliniagerdroudbari (Fall 2017 – Spring 2021) — Dissertation: Strain-Based Piezoelectric Energy Harvesters for Intelligent Tire Sensors
7. Hammad Al-Shammari (Summer 2018 – Summer 2021) — Dissertation: Modeling and Experimental Investigation of Regenerating the Mixed Cathode Active Materials of Spent Lithium-Ion Batteries
6. Reza Hashemi (Fall 2016 – Spring 2021) — Dissertation: An Intelligent Battery Management System for Electric and Hybrid Electric Aircraft
5. Roja Esmaeeli (Fall 2016 – Summer 2020) — Dissertation: Direct Testing of Tire Tread Compounds at High Frequencies Using a Newly Developed Dynamic Mechanical Analysis (DMA) System
4. Muapper Alhadri (Fall 2015 – Summer 2019) — Dissertation: Empirical Modeling and Analysis of Degradation of the Lithium-Ion Battery for Different First- and Second-Use Applications
3. Münür S. Herdem (Summer 2014 – Spring 2019) — Dissertation: Multiphysics Modeling of Micro-channel Methanol Reformer. (Co-supervisor)
2. Waleed Zakri (Fall 2014 – Summer 2018) — Dissertation: Fabrication and Simulation of Semi-Solid Electrodes for Flexible Lithium-ion Batteries
1. Ali Ghorbani Kashkooli (Spring 2014 – Fall 2017) — Dissertation: Nanoscale X-ray Computed Tomography Based Modeling of Lithium ion Battery Electrodes. (Co-supervisor)

(b) M.Sc. Students

Current:

3. Joshua Campbell (Spring 2021 – Present) — Thesis: Experimental Study on Material Removal Mechanisms in Single Grit Grinding of Silicon Nitride
2. Joshua Dunham (Fall 2020 – Present) — Thesis: Study on Dendrite Growth Mechanisms in Argyrodite Electrolyte for Lithium Batteries
1. Hamid Khatibi (Fall 2019 – Present) — Thesis: Recycling and Reusing Copper and Aluminum Current-Collectors from Spent Electric Vehicles' Lithium-ion Batteries

Graduated:

7. Mike Kelly (Fall 2019 – Summer 2021) — Thesis: Simplified Model for Rubber Friction to Study the Effect of Direct and Indirect DMA Test Results
6. Ian Kay (Fall 2017 – Fall 2019) — Thesis: Robotic Disassembly of Electric Vehicle Lithium-ion Battery Packs for Recycling
5. Mohammed Abdul Haq (Fall 2016 – Spring 2018) — Thesis: Dual-purpose Cooling Plates for Thermal Management of Lithium-ion Batteries During Normal Operation and Thermal Runaway
4. M. Varma Koricherla (Fall 2016 – Summer 2017) — Thesis: Experimental Modal Analysis of a Lithium-ion Battery Using Dynamic Excitation (Co-supervisor)

3. Evan Foreman (Fall 2015 – Spring 2017) — Thesis: Fluidized Cathodes for Flexible Lithium-ion Batteries
2. Amir Amirfazli (Summer 2015 – Fall 2016) — Thesis: Low Catalyst Loaded Ethanol Gas Fuel-Cell Sensor
1. Ashkan Nazari (Fall 2014 – Summer 2016) — Thesis: Heat Generation in Lithium-ion Batteries

(c) Undergraduate Research:

9. Dylan Luptak (Fall 2022 – Present) — Machine Learning Code Development to Model Grinding Silicon Nitride
8. Isabelle Davis (Fall 2022 – Present) — Topology Optimization for Part Manufacturing to Repair Spacecraft
7. Kayla Dremann (Fall 2022 – Present) — Inspection of Spacecraft Using 3D Scanners for Fault Detection and Repair
6. Melisa Cardew (Spring 2022) — Market Analysis for Recycling Electric Vehicles' Lithium-ion Batteries
5. Alexis Jordan (Spring 2022) — Market Analysis for Recycling Electric Vehicles' Lithium-ion Batteries
4. Matthew Rozmajzl (Spring 2021 – Summer 2022) — Designing a Single Grit Scratch Test Setup for Silicon Nitride
3. Dominic Frisone (Fall 2020 – Present) — Recycling Lithium-Ion Battery Materials
2. Letia Bass **(NSF-REU)** (Fall 2017 – Spring 2018) — Designing and Building a New DMA Measurement System
1. Chiran JBR (Fall 2016 – Fall 2017) — Modeling and Computer Simulation for Determination of Natural Frequency and Mode Shapes of a Miniaturized Test Clamp

DEFENSE COMMITTEE MEMBER

Ph.D. Dissertations / Proposals:

13. Ruiting Xu, Fall 2022 — Microfluidic Sensor for Aptamer-Based Molecular Detection via Nanoparticle Counting and Geometry Modulation; Advisor: Dr. Jiang John Zhe, Mechanical Eng. Dept.
12. Ulises Martin Diaz, Fall 2021 — Stress Corrosion Cracking, Passivity Breakdown and Fracture Mechanisms of Stainless Steel Reinforcements in Simulated Concrete Pore Solution; Advisor: Dr. David Bastidas, Chemical & Biomolecular Eng. Dept.
11. Yaser Almazrou, Summer 2020 — Multifunctional Flexoelectric Polymer Electrolyte Membranes (PEMs) for Energy Harvesting and Storage Devices; Advisor: Dr. T. Kyu, Polymer School
10. Md Omar Faruk Emon, Spring 2020 — Ionic Liquid-based 3D Printed Soft Pressure Sensors and Their Applications; Advisor: Dr. Jae-Won Choi, Mechanical Engineering Department
9. Han Lin, Spring 2020 — Graphene Oxide-based Membrane for Liquid and Gas Separation; Advisor: Dr. Jiahua Jack Zhu, Chemical & Biomolecular Eng. Dept.
8. Mohammad Ranjbar, Summer 2019 — Optimal Signaling Strategies and Fundamental Limits of Next Generation Energy-Efficient Wireless Networks; Advisor: Dr. N.H. Tran, Elec. Eng. Dept.
7. Xiao Zhang — Probing Polymer Dynamics Using High Throughput Broadband Dielectric

	Summer 2018	Spectroscopy; Advisor: Dr. Alamgir Karim, Polymer Engineering Department
6.	Camilo Piedrahita Summer 2018	Neuro Inspired Polymer Electrolyte Membrane; Ion Concentration Gradient for Energy Restoration in Li-ion Batteries; Advisor: Thein Kyu, Polymer Eng. Dept.
5.	Yahya Fageehi Summer 2018	Simulation-Based Optimization for Complex System with Supply and Demand Uncertainty, Advisor: Dr. Shengyong Wang, Mechanical Eng. Department
4.	Ehsan Saeidpour Parizy Fall 2017	Electrical Energy Retail Price Optimization for an Interconnected / Islanded Power Grid; Advisor: Dr. Hamid Bahrami, Electrical & Computer Eng. Dept.
3.	Fatih Cingoz Summer 2016	Effective Power Management for Autonomous Operations of Microgrids, Advisor: Dr. Yilmaz Sozer, Electrical & Computer Engineering Department
2.	Shirin N. Oliaee Spring 2016	Catalytic Decomposition of Hydrazine; Advisors: Dr. Zhenmeng Peng and Dr. Harry M. Cheung, Chemical Engineering Department
1.	Bikash Parajuli Spring 2016	Laminar flame speeds and autoignition of dimethyl ether at elevated pressure; Advisor: Gaurav Mittal, Mechanical Engineering Department

M.Sc. Theses/Reports:

13.	Rayanne Pinto Costa Fall 2020	Transition to Turbulence within an Eccentric Stenosis Geometry under Steady Flow Using Laser Doppler Vibrometer for Non-Newtonian and Newtonian Fluid; Advisor: Dr. Francis Loth, Mechanical Eng. Dept.
12.	Vaidehi Menon Summer 2020	Stiffness and Strain Sensitivity of Graphene-CNT Van Der Waals Heterostructures: Molecular Dynamics Study; Advisor: Dr. Alper Buldum, Mechanical Eng. Dept.
11.	Ran Li Spring 2020	Research on Highly Conductive Solid-State Electrolyte Membrane and New Electrode Binder (FLEP 60) in Polymer Electrolyte Lithium Ion Half Cells; Advisor: Dr. Thein Kyu, Polymer Eng. Dept.
10.	Steve Macsay Fall 2018	Aeroponics System Nozzle Study; Advisor: Dr. Gopal Nadkarni, Mechanical Eng. Dept. (MSc. Report)
9.	Alex Russell Fall 2018	A Low-Cost Portable Monitoring Solution for Seamless Patient Data and Wireless Vitals Monitoring in the OR; Advisor: Dr. Ajay Mahajan, Mechanical Eng. Dept.
8.	Tamira Ford Fall 2018	Synthesis and Characterization of Zeolite Adsorbents for Application in Fuel Vapor Recovery Systems; Mechanical Eng. Dept. (MSc. Report)
7.	Ishwor Gautam Summer 2018	Quaternion Based Attitude Estimation Technique Involving the Extended Kalman Filter; Advisor: Dr. Celal Batur, Mechanical Eng. Dept.
6.	Pashupati Dhakal Spring 2016	Numerical Investigations of the Effect of Fill Factor in an Internal Mixer for Tire Manufacturing Process; Advisor: Dr. Abhilash Chandy, Mech. Eng. Dept.
5.	Mohammad Moasherziad Spring 2016	Investigating on Steel Riveting Process and Obtaining the Equation for Calculation of Steel Riveting Force; Advisor: Dr. Sergio Felicelli, Mechanical Eng. Dept. (MSc Report)
4	Bhavya Sree Godavarthi Fall 2014	A Computational Study on the Effect of Injection Strategy on Emissions in a DME Fueled CI Engine; Advisor: Gaurav Mittal, Mechanical Eng. Department
3.	Amar KC Fall 2014	Numerical Simulations of Magnetohydrodynamic Flow and Heat Transfer; Advisor: Abhilash Candy, Mechanical Engineering Department
2.	Michael Crawford Summer 2014	A Computational Study of Mixing in Jet Stirred Reactors, Advisor: Gaurav Mittal, Mechanical Engineering Department
1.	Varun Anthony Davies Spring 2014	Auto-ignition Study of Ethanol and Heptane in a Rapid Compression Machine, Advisor: Gaurav Mittal, Mechanical Engineering Department

ADVISING UNDERGRADUATE SENIOR DESIGN / CAPSTONE PROJECTS

35.	Spencer Frase, Jared Vance, Ryan Ohlin, Duncan Welch, John DiPaolo Fall 2022 – Present	Design a Machine for Recycling Scrap Materials in Lithium-Ion Batteries Manufacturing Facilities
34.	Dylan Luptak Fall 2022 – Present	Design a Test Machine to Study Grinding of Silicon Nitride for Roller Bearings
33.	Bamidele Oluwadare, Luke Musil, Nelson Lopez Mazariegos, Dominic Frisone Fall 2021 – Spring 2022	Design a Machine for Recycling Electric Vehicles' Lithium-Ion Battery Packs **AWARD WINNER**
32.	Michael Simon, Ryan Hosso Fall 2021 – Spring 2022	Design a Test Machine to Study Grinding and Super-Finishing Manufacturing Processes
31.	Seyed Taha Fida Fall 2021 – Fall 2022	Design a Precision Thickness Measurement System for Pelletization of Ceramics Powder for Lithium Batteries
30.	Jacob Knechtel, Ryan Slivka, Aaron Markgraf, Adam Johnson, Jacob Buechele Fall 2020 – Spring 2021	Designing an energy harvesting and measurement system for intelligent tires
29.	Eli Chiti, Bartholomew Kitko, Matthew Berger, Trayce Harris, Mark Kulesa Fall 2019 – Spring 2020	Design of a Recycling Facility for Energy Materials
28.	Jeremiah Fitzgerald, Zachary J Lindsey, Nathan Embaugh, Jason Mack Fall 2019 – Spring 2020	Piezoelectric Energy Harvester Improvements
27.	Troy Hudson, Mohammad Felemban Fall 2018 – Spring 2019	Hydrogen Fuel System for an Internal Combustion Engine
26.	Greg Young, Thomas Thornton, Nate Moskos Fall 2018 – Spring 2019	Shop N' Charge Cell Phone Battery
25.	Samuel Horn, Ben Roessler, Isaac Smith Fall 2018 – Spring 2019	Energy Saving in Industrial Robots
24.	Ziyad Almohatrish, Michael Condo, Jacob Eberly, John Wilson Fall 2018 – Spring 2019	Design of Piezoelectric Energy Harvester for Intelligent Tires
23.	Letia Bass, Michaela McCrae, Ethan Goodman, Joseph Mazur Fall 2017 – Spring 2018	Test Setup for Rubber Properties Measurements
22.	Andres Viduya, Matt Mc-Clone, Alec Drzemieck, Brandon Groves Fall 2017 – Spring 2018	Energy Saving by Properly Programming of Industrial Robots
21.	Noah Purdy, Olivia Cole, Jake Happ Fall 2017 – Spring 2018	Designing and Building a Safe Chamber for Battery Post Tests
20.	Johnathan Klebe, Tyler Miller, Mitchell Wheeler, Madison Popa Fall 2017 – Spring 2018	Designing and Building a New Garbage Disposer System
19.	Kaitlin Klotzle, Cynthia Stoller, Kelsey Wilson, Katrina Elfrink, Crysta Yamamoto	Designing a Light-Weight, Inexpensive, Disposable, and High-Strength Lighted Ear Curette **AWARD WINNER**

	Fall 2016 – Spring 2017	
18.	Matt Stolfer, Matt Murrow, Aaron Moser, Ryan Kramanak, Jered Tyler Fall 2016 – Spring 2017	Flexible Battery Design and Testing
17.	Elisha Dale, Anatoliy Torchilo, Chiran JBR, Megan Staimer Fall 2016 – Spring 2017	Designing a New DMA Device for Measurement of Rubber Mechanical Properties
16.	Ben Todd, Matt Rabenold, Carl Vilardo, Joshua Van Pelt Fall 2016 – Spring 2017	Auxiliary Power for Trucks by Wind Turbine
15.	Luke Baker, Cory Price Fall 2015 – Spring 2016	Aerial Aquatic Drone (Hydro Drone) **AWARD WINNER**
14.	Steven Feyedelem, Robert Mitman Fall 2015 – Spring 2016	Designing a New Weight Lifting Clip
13.	Stephen Hostutler, Daniel Bolovan Fall 2015 – Spring 2016	Soap Pump Despiser Dystem Design
12.	Trevin Hartzler Fall 2015 – Spring 2016	High-voltage Battery Pack Design for Electric FSAE Race Car
11.	Kyle Leifhert, Joseph Dejacimo, Jared Cornett, Annie Klindworth Fall 2015 – Spring 2016	Designing Nano Drones with Hybrid Structural Energy Storage
10.	Zachary Wysocki, Isaiah William, Matthew Jost, Lucas Barker Fall 2015 – Spring 2016	Designing a New Housing for Fuel Cell Sensors to Minimize Fuel Leakage
9.	Alex Prorok Fall 2015 – Spring 2016	Optimization of Formula SAE Electric Vehicle Frame with Finite Element Analysis
8.	Fitim Musahu Summer 2015 – Fall 2015	Impact Attenuator for Formula Electric Vehicle
7.	Tony Romito Summer 2015 – Fall 2015	Electrochemical Sensor Fabrication and Testing
6.	Heather Perod, Michael Massaro, Matthew Massaro Fall 2014 – Spring 2015	Designing Low Cost and Modern Rims for Vehicles
5.	Aaron Jackson, Chris Remington, Evan Foreman, Dylan Irvine, Samuel Endrizzi Fall 2014 – Spring 2015	Designing Heat Sinks for Effective Cooling of Lithium-ion Battery Packs in Electric Vehicles
4.	Nick Galbincea Fall 2014 – spring 2015	Formula Electric SAE, Heat Transfer Analysis of Braking System and Rotor Design for Vehicle
3.	Rob Weise, Andrew Rodaites Fall 2014 – Spring 2015	Designing Fuel Cell and Battery-Operated Equipment for Underground Mines for Reducing Ventilation Load
2.	Adam Ghannoum Fall 2014 – Spring 2015	Pilot-chute Improvement and Optimization
1.	James Hayes Fall 2014 – Spring 2015	Computer Design and Analysis of Shell and Tube Heat Exchangers for Minimization of Pressure Drop