Reza Rashidi

Associate Professor of Practice
Mechanical and Aerospace Engineering Department
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EDUCATION

- **Ph.D. – Mechanical Engineering** 2006-2011
  - **Subspecialization – Engineering Management (management and entrepreneurship)**

University of British Columbia Vancouver, Canada
Dissertation: Development of MEMS Pressure, Temperature and Conductivity Sensor devices (SmartChip) for High-Temperature and Harsh Environments

- **M.Sc. – Materials Engineering** 1993-1995

University of Tehran Tehran, Iran
Thesis: Development of Alkaline Fuel Cells

- **B.Sc. – Materials Engineering** 1989-1993

Sharif University of Technology Tehran, Iran

ACADEMIC EXPERIENCE

Associate Professor of Practice – Mechanical & Aerospace Engineering Department Jan 2023-present
University at Buffalo, State University of New York Buffalo, NY

- Teaching MAE 451 and MAE 494
- Lead coordinator for senior design sequence

Associate Professor & Department Chair – Mechanical & Electrical Engineering Technology Jan 2021-Jan 2023
Assistant Professor – Mechanical & Electrical Engineering Technology Department Aug 2016-Dec 2020
State University of New York, Alfred State Alfred, NY

- Connection with local industry
  - Acquired over 30 multidisciplinary funded projects (see the details in Industry Fundraising section) and coordinated the projects to be advised by faculty members.
  - Supporting 50-70 students from four engineering majors in their senior project every year
  - Advised industrial senior projects
  - Chair of IAB general committee and executive committee
- Teaching
  - Senior Seminar & Project Design (industry-sponsored style developed)
  - Senior Technical Project (industry-sponsored style developed)
  - Mechanics of Materials (lecture and lab)
  - Microfabrication (lecture and lab, developed)
  - MEMS Development (developed, design project based)
  - Sensors and Actuators (developed, design project based)
  - Engineering Computing Applications (MATLAB and SIMULINK)
  - Engineering Science Seminar
- ABET / Assessment
  - Coordinated MET BS program
  - Helped prepare a self-study report for 2018 ABET visit
  - Mapped outcome assessment
  - Assessed student outcomes
  - Evaluated the data collected from courses to facilitate continuous program improvement
  - Used Watermark to record student learning outcomes

- Research areas
  - Mechanical Design
  - Energy Harvesting
  - MEMS
  - Sensors and Actuators
  - Biomedical Devices
- Advised 30-40 students
- Coordinated the cleanroom and purchased Microfabrication/characterization equipment
- Committee member/chair
  - Campus-wide Promotion and Continuing Appointment Committee
  - Campus-wide College Strategic Planning Committee
  - Faculty Search Committees (several)
- Department chair activities
  - Developed and implementing the department strategic vision/mission
  - Led the development, implementation, and evaluation of department programs, plans, and goals
  - Engaged with local industry and professional organizations
  - Helped maximize successes within existing program initiatives in the areas of clean energy, manufacturing, industrial automation, design, and microsystems
  - Led the department for program accreditation and evaluation
  - Managed department budgets
  - Held IAB meetings and engaged IAB in the department activities

Postdoctoral Fellow – Department of Electrical and Computer Engineering 2011
University of British Columbia Vancouver, BC, Canada

- Development of Smart Stents Using Micro-Electro-Discharge-Machining (µEDM) Technique for Wirelessly Monitoring Blood Flow/Pressure in Coronary Arteries
- Monitoring Coiled Cerebral Aneurysms Using a Wireless Sensory System
- Co-supervised graduate and undergraduate students

Invited Lecturer – Department of Electrical and Computer Engineering 2011
University of British Columbia Vancouver, BC, Canada

- MEMS Sensors: Design, Fabrication and Characterization

Teaching Assistant – Department of Mechanical Engineering 2008-2009
University of British Columbia Vancouver, BC, Canada

- Engineering Case Studies

Research Assistant – Department of Mechanical Engineering 2006-2010
University of British Columbia Vancouver, Canada

- Developed MEMS liquid conductivity, pressure, and temperature micro-sensors for chemical process monitoring of harsh- environment pulp digesters

Lecturer – Department of Materials Science and Engineering 2003-2005
Azad University Saveh, Iran

- Mechanical Properties of Materials (I)
- Heat Treatment

Adjunct Lecturer – Training and Education Office 1999-2005
Niroo Research Institute Tehran, Iran

- Manufacturing Processes of Metallic parts
- Design, Manufacturing and Materials of Gas Turbine Blades
- Quality Management System for Testing Laboratories (ISO/IEC 17025)

Adjunct Lecturer – Department of Mechanical Engineering 1997
Azad University Kerman, Iran
- Materials Science and Engineering

INDUSTRIAL EXPERIENCE

Senior Engineer – Gas Turbine 2011-2016
Siemens Energy Charlotte, NC
- Stress/strain analysis of gas turbine's critical components (e.g. blades and vanes)
- Simulated laser welding process using FEM Sysweld software
- Conducted experimental research in laser welding repair of superclean rotors
- Performed root cause, failure analysis and remaining life assessment of gas turbine's hot components
- Provided technical guidance relating to manufacturing issues to ensure the proper functioning of gas turbines
- Created or edited technical specifications and process qualifications
- Reviewed vendor test reports to ensure their compliance with applicable requirements

Director and Faculty Member– Chemistry and Materials Center 2000-2006
Niroo Research Institute (NRI) Tehran, Iran
- Performed and managed several product development projects
- Prepared several technical reports and funding proposals
- Managed commercializing four products
- Supervised reference laboratories for implementation of standard ISO/IEC 17025

Vice-President of Training and Education and Faculty Member 1998-2000
Niroo Research Institute Tehran, Iran
- Conducted training and education at NRI
- Developed short term courses for industry employees
- Signed memorandum with two universities for joint project-based master programs

Engineer– Department of Materials Engineering 1997-1998
Niroo Research Institute Tehran, Iran

Engineer – Department of Materials Engineering 1996-1997
Electric Power Research Center Tehran, Iran

INDUSTRY FUNDRAISING AT ALFRED STATE FOR STUDENT PROJECTS

I35. Automate wash process of two cast iron assemblies, HDM Hydraulics, LLC, Tonawanda, NY, Three students from Mechanical and Electrical Engineering, Budget: $50,000, Fall 2022 – Spring 2023

I34. Redesign fixture system to eliminate unwanted movement and redesign flushing and air blow system, General Motors – Engine Plant, Tonawanda, NY, Three students from Mechanical and Computer Engineering, Fall 2022 – Spring 2023

I33. Automatic control of temperature and humidity in a concrete curing room, Encorus, Springville, NY, Two students from Mechanical and Electrical Engineering, Budget: all hardware funded, Fall 2022 – Spring 2023

I32. Recip Compressor Valve Manifold Design, Siemens Energy, Painted Post, NY, Two students from Mechanical Engineering, Budget: all hardware funded, Fall 2022 – Spring 2023

I31. Design, build, implement, and support automated book convetor/sorter system, Dematic, West Henrietta, NY, Three students from Mechanical, Electrical and Computer Engineering, Budget: all hardware and $750 funded, Fall 2022 – Spring 2023

I30. Design, build, and test an effective FLISR scheme using relays to simulate faults on the simplified feeder, National Grid, NY, Two students from Electrical Engineering, Budget: all hardware funded, Fall 2022 – Spring 2023

I29. Design and build a hypochlorous acid electrolyzed water conveyor produce wash system with UV light tunnel, Finger Lakes Incubator and Commercial Kitchen (FLICK), LLC, Auburn, NY, Three students from Mechanical Engineering, Budget: $5,000, Fall 2022 – Spring 2023

I28. Integrated Sustainable Building Design (ISBD), Patriot Design and Consulting, Rochester, NY, Three students from Mechanical and Electrical Engineering, Fall 2022 – Spring 2023

I27. Automate the current packaging process for K-wires, Jabil, Horseheads, NY, Three students from Mechanical and Computer Engineering, Budget: $5,000 and more if needed, Fall 2022 – Spring 2023

I26. Automate installing protective tip of drill tip guide wire, Jabil, Horseheads, NY, Three students from Mechanical and Electrical Engineering, Budget: $5,000 and more if needed, Fall 2022 – Spring 2023

I25. Design aspects of a building, Pathfinder Engineers & Architects, LLP, Rochester, NY, Three students from Mechanical and Electrical Engineering, Fall 2022 – Spring 2023

I24. Development of an analysis/reporting software and exploring adding sensors to equipment, Moog – Industrial Controls Division, East Aurora, NY, Three students from Mechanical, Electrical and Computer Engineering, Budget: all hardware/software funded, Fall 2022 – Spring 2023

I23. Full MEP design of a past IBC project, IBC Engineering P.C., Rochester, NY, Three students from Mechanical and Electrical Engineering, Fall 2022 – Spring 2023

I22. Design a building system for Crypto mining, Hunt Engineers, Architects, and Surveyors, Horseheads, NY, Three students from Architecture and Mechanical and electrical Engineering, Fall 2022 – Spring 2023 (declined)

I21. Event robotic vending machine, ASC Applied Learning, Alfred, NY, Two students from mechatronics and electrical Engineering, Budget: $5,000, Fall 2022 – Spring 2023

I20. Development of a Fanuc robot based semi-automated weld machine, HDM Hydraulics, LLC, Tonawanda, NY, Five students from Mechanical, Electrical, and Mechatronics Engineering, Budget: $50,000, Fall 2021 – Spring 2022

I19. Large Valve Manifold Design, Siemens Energy, Painted Post, NY, Four students from Mechanical, electrical and Mechatronics Engineering, Budget: all hardware funded, Fall 2021 – Spring 2022

I18. Optimization and design improvement of semi-automated isolator machine using Stage Gate Project Management (DMAIC) process, Eaton, Olean, NY, Four students from Mechanical, electrical and Mechatronics Engineering, Budget: initial $15,000 and other costs paid by the company, Fall 2021 – Spring 2022

I17. Development of metal oxide varistor epoxy collar machine, Eaton, Olean, NY, Four students from Mechanical, electrical and Mechatronics Engineering, Budget: initial $15,000 and other costs paid by the company, Fall 2021 – Spring 2022

I16. Design of a geo-thermal heating and cooling system for walk-in cooler and freezer, Feast Kitchen, LLC, Auburn, NY, Four students from Architecture, and Mechanical and electrical Engineering, Budget: $45,000, Fall 2021 – Spring 2022 (not started)

I15. Conversion of an existing commercial dishwasher to a hypochlorous acid electrolyzed water conveyor produce wash system with UV light tunnel, Feast Kitchen, LLC, Auburn, NY, Three students from Mechanical and electrical Engineering, Budget: $7,500, Fall 2021 – Spring 2022

I14. Mass 3D-printed finishing machine, Cross Product Design R&D, Buffalo, NY, Four students from Mechanical, Electrical and Computer Engineering, Budget: $2,000, Fall 2021 – Spring 2022

I13. Development of a farm biogas digester prototype, Alfred State, Alfred, NY, Four students from Mechanical Engineering, Budget: $5,000, Fall 2021 – Spring 2022

I12. Evaluation of the feasibility of using native AutoDesk REVIT HVAC load modeling software for system design in comparison to Carrier HAP, Trane Trace and DOE2 eQUEST, Popli Design Group, Penfield, NY, Two students from Architecture and Mechanical Engineering, Budget: $1,500, Fall 2021 – Spring 2022

I11. Robotic automation of engineering process including 3D modeling and electrical design and implementation, Adaptec Solutions, Rochester, NY, Four students from Mechanical, electrical, Computer and Mechatronics Engineering, Fall 2021 – Spring 2022

I10. Design of energy-efficient HVAC systems, IPD Engineering, Buffalo, NY, Three students from Mechanical Engineering, Fall 2021 – Spring 2022

I9. HVAC design calculations of energy-efficient buildings and energy systems, Patriot Design and Consulting, Rochester, NY, Two students from Mechanical Engineering, Fall 2021 – Spring 2022

I8. HVAC system selection of energy-efficient buildings and energy systems, Patriot Design and Consulting, Rochester, NY, Three students from Mechanical Engineering, Fall 2021 – Spring 2022

I7. Integrated sustainable building design (ISBD) of energy-efficient buildings and energy systems, Patriot Design and Consulting, Rochester, NY, Five students from Architecture, and Mechanical and Electrical Engineering, Fall 2021 – Spring 2022

I6. Feasibility study for conversion of a commercial building located in Climate Zone 5A to a carbon neutral ready building meeting a target annual energy usage index, Pathfinder, Rochester, NY, Four students from Architecture, and Mechanical and Electrical Engineering, Fall 2021 – Spring 2022

I5. Design for conversion of an old warehouse into central New York's PBS television/radio station in Syracuse: HVAC systems zoning, load/energy and ductwork design, and equipment selection, IBC Engineering P.C., Rochester, NY, Seven students from Mechanical Engineering, Fall 2021 – Spring 2022

I4. Design for conversion of an old warehouse into central New York's PBS television/radio station in Syracuse: power, lighting and telecommunication systems design, and day light harvesting and electrical panel sizing, IBC Engineering P.C., Rochester, NY, Two students from Electrical Engineering, Fall 2021 – Spring 2022

I3. Power system design of Alfred State medium voltage distribution system, C&S Engineers, Inc., Syracuse, NY, Two students from Electrical Engineering, Fall 2021 – Spring 2022

I2. Development of a data consolidation system for the existing heat exchanger product line, Allegheny Bradford Corp., Bradford, PA, One student from Computer Engineering, Budget: $2,000, Spring 2021

I1. Qualification of new bearing babbitting process, Scott Rotary Seals, Olean, NY, Two students from Mechanical Engineering, Budget: all hardware funded, Fall 2017 – Spring 2018

RESEARCH/EQUIPMENT FUNDRAISING

- **Equipment Purchase Fund**
  Alfred State, ~$80,000, 2016-2022
- **Applied Learning Fund**
  Alfred State, ~$20,000, 2016-2022
- **Development of piezoresistive pressure sensors for use in high temperature applications**
  Canadian Microsystems (CMC), $10,000, 2008
- **High temperature and harsh environment packaging of piezoresistive pressure sensors**
  Canadian Microsystems (CMC), $10,000, 2008

PUBLICATIONS

Refereed Journals

J17. R. Hall and **R. Rashidi**, Multi-directional universal energy harvesting ball, *Micromachines,* 12 (4) (2021) 457

J16. J. Martin and **R. Rashidi**, A differential transformer-based force sensor utilizing a magnetic fluid core, Microsystem Technologies, 27(1) (2021) 115-126

J15. T. Coughlin and **R. Rashidi**, A powerless iron oxide based magnetometer, *Microsystem Technologies,* 26 (2020) 2487–98

J14. A. DeGraff and **R. Rashidi**, Ferrofluid transformer-based tilt sensor, *Microsystem Technologies,* 26 (2020) 2499–2506

J13. **R. Rashidi,** N. Summerville and M. Nasri, Magnetically actuated piezoelectric-based rotational energy harvester with enhanced output in wide range of rotating speeds, *IEEE Transactions on Magnetics*, 55 (9) (2019) 1-8

J12. **R. Rashidi,** J. Alenezi, J. Czechowski, J. Niver and S. Mohammad, Graphite-on-paper-based resistive sensing device for aqueous chemical identification. Chemical Papers, *Chemical Papers*, 73 (11) (2019) 2845-55

J11. **R. Rashidi**, M.S.M. Ali, D. Lappin, C. Schlosser and K. Takahata, Inductive antenna stent: design, fabrication, and characterization, *Journal of Micromechanics and Microengineering*, 23 (2) (2013) 025015

J10. D. Lappin, **R. Rashidi** and K. Takahata, An experimental study of electrochemical polishing for micro-electro-discharge-machined stainless-steel stents, *Journal of Materials Science: Materials in Medicine,* 23 (2) (2012) 349-56

J9. R. Rashidi, T.C.M. Graham, J.D. Madden and C.P.J. Bennington, Towards a flow following ionic conductivity and temperature sensor package, *Industrial & Engineering Chemistry Research*, 51 (6) (2012) 2738-46

J8. R. Rashidi, K. Chen, M.S.M. Ali and K. Takahata, Radio aneurysm coils for noninvasive detection of cerebral embolization failures: A preliminary study, *Biosensors and Bioelectronics*, 30 (2011) 300-5

J7. D. Brox, **R. Rashidi** and K. Takahata, A non-lithographically microfabricated capacitive pressure sensor for biomedical applications, *Electronics Letters*, 47 (18) (2011) 1015-17

J6. R. Rashidi, C.P.J. Bennington and M. Chiao, Development of a combined piezoresistive pressure and temperature sensor using chemical protective coating for kraft pulp digester process monitoring, *Journal of Micromechanics and Microengineering*, 21 (1) (2011) 015009

J5. R. Rashidi, C.P.J. Bennington and M. Chiao, A hybrid capacitive pressure and temperature sensor fabricated by adhesive bonding technique for harsh environment of kraft pulp digesters, *Microsystem Technologies*, 17 (1) (2011) 149-60

J4. R. Rashidi, T.C.M. Graham, C.P.J. Bennington and M. Chiao, Development of a compensated capacitive pressure and temperature sensor using adhesive bonding and chemical-resistant coating for multiphase chemical reactors, *Sensors and Actuators A: Physical*, 163 (2) (2010) 471-80

J3. M.H. Pishbin, **R. Rashidi** and M. Nasri**,** Optimization of manufacturing parameters for Ni-Ag fuel cell electrode, *Fuel Cells*, 7 (4) (2007) 291-97

J2. M. Mohandes and **R. Rashidi,** Variables affecting the fabrication and glazing of zinc oxide varistor blocks, *Journal of Electrical Science and Engineering*, 44 (2005) 43-54 *(Persian)*

J1. A. Zhaam and **R. Rashidi,** Corrosion and its prevention methods in thermal power plants, *Journal of Electrical Science and Engineering*, 25 (1998) 1-7 *(Persian)*

Refereed Conferences

C17. B. Miller, S. Barker and **R. Rashidi**, Triboelectric-based energy harvesting face mask using recyclable materials, *12th International Conference on Sensor Device Technologies and Applications,* Athens, Greece, Nov. 2021

C16. A. Bailey, T. Michelson and **R. Rashidi**, An Undergraduate Hands-On Approach to Microfabrication Applied Learning Towards Developing a Silicon-Based Microfluidic Pressure Sensor Array, *ASEE Annual Conference and Exposition,* Montreal, Canada, June 2020

C15. I. Cooke, B. DeClerck, J. Hallett, T. Miller, A. Mitchell and **R. Rashidi**, A magnetic and shape memory alloy actuated gripper for surgical applications, *ASME International Mechanical Engineering Congress and Exposition (IMECE),* Salt Lake City, UT, Nov. 2019

C14. T. Michelson, J. Rudnick, J. Baxter and **R. Rashidi**, A novel ferrofluid-based valve-less pump, *ASME International Mechanical Engineering Congress and Exposition (IMECE),* Salt Lake City, UT, Nov. 2019

C13. J. Bianconi, J. Hallett, J. Pealo and **R. Rashidi**, A hybrid piezoelectric and inductive rotational energy harvester, *IOP* 6th *International Conference on Mechanics and Mechatronics Research*, Chongqing, China, July 2019

C12. R. Rashidi, N. Summerville and M. Nasri, A Dual-Purpose Piezoelectric Multi-Beam Energy Harvesting and Frequency Measurement Device for Rotational Applications, *IEEE-MIT Undergraduate Research Technology Conference*, Boston, MA, Oct. 2018

C11. K. Bower, R. Colon, C. Karnyski, J. Minkel and **R. Rashidi**, Piezoelectric-based monitoring of restless legs syndrome (RLS), *Springer International Conference on Mechatronics and Intelligent Robotics*, Kunming, China, May 2018

C10. J. Alenezi, J. Czechowski, J. Niver, S. Mohammad and **R. Rashidi**, Graphite Line on Paper as an Aqueous Chemical Sensor, *Springer International Conference on Mechatronics and Intelligent Robotics*, Kunming, China, May 2018

C9. T. Duell, M. Muehlbauer, T. Seitzinger, J. Westfall and **R. Rashidi,** MEMS Capacitive Sensor for Wound Monitoring Applications, *IOP* 5th *International Conference on Mechanics and Mechatronics Research*, Tokyo, Japan, July 2018

C8. A. Mbaye, C. Kreamer, L. Zink, M. Fredenburg and **R. Rashidi**, 3D Printed Micro Check Valve for Biomedical Applications, *IOP* 5th *International Conference on Mechanics and Mechatronics Research*, Tokyo, Japan, July 2018

C7. D. Brox, **R. Rashidi** and K. Takahata, Non-Lithographically Micromachined Capacitive Pressure Sensor Based on Stainless Steel for Biomedical Applications, *IEEE Sensors*, Limerick, Ireland, Oct. 2011

C6. R. Rashidi and M. Chiao, A simple method for adhesive bonding of capacitive pressure sensors, *ASME International Mechanical Engineering Congress*, Vancouver, Canada, Nov. 2010

C5. T.C.M. Graham, E. Liu, **R. Rashidi**, N. Sadeghi, E. Albadvi, S. Mirabbasi, M. Chiao, J.D. Madden, C.P.J. Bennington, Development of a flow-following sensor package for application in chemical pulp digesters, *EXFOR & Annual Meeting*, Montreal, Canada, Feb. 2010, pp. 51-59

C4. R. Rashidi and A. Zhaam, Study on corrosion of thermal power plant condenser tubes, *EUROCORR 2004 conference*, Nice, France, Sep. 2004, pp. 12-16

C3. R. Rashidi and A. Zhaam, Study and production of fuel cell electrodes, *ISATA 2000 conference*, Dublin, Ireland, Sep. 2000, pp. 25-27

C2. R. Rashidi, A simulation for effect of chill thickness on solidification rate, *The 4th National Congress of Foundry Directors*, China Foundry Association, Beijing, China, May 2000, pp. 5-7

C1. R. Rashidi and P. Davami, Effect of chill thickness on solidification rate of alloy Al-7%Si, *6th Seminar of Iranian Founders Society,* Tehran, Iran, May 1994 *(Persian)*

Invited Publications

A3. R. Rashidi, MEMS piezoresistive pressure sensor for high-temperature applications, CMC Microsystems, Online application note (2010)

A2. R. Rashidi, Packaging of MEMS pressure sensors for harsh environments, CMC Microsystems, Online application note (2010)

A1. R. Rashidi, Superalloys used in gas turbine blades, *MATN-PAYAM*, 23 (1997) 17-20 *(Persian)*

Presentations

P1. R. Rashidi and N. Summerville, Piezoelectric energy harvesters for rotational applications, *AUenergy Symposium*, Alfred, NY, October 2018

Media Release

M3. R. Rashidi, Dr. Rashidi making a big difference with small technology, ASC Public Media, July 2, 2021

M2. R. Rashidi, S. Barker, B. Miller, R. Lohr, T. Sax, X. Ramos and J. King, ASC engineering students developing innovative energy harvesting devices, Olean Times, April 13, 2021

M1. R. Rashidi and K. Takahata, UBC researchers devise new technology to monitor brain aneurysms, UBC Public Media, November 4, 2011

SELECETD RESEARCH AT ALFRED STATE (Funded by Provost through Applied Learning)

A29. Triboelectric-based Energy Harvesting Face Mask 2021
Advisor, SUNY Alfred State Alfred, NY

A28. Piezoelectric Energy Harvesting Shoe Insole 2021
Advisor, SUNY Alfred State Alfred, NY

A27. Triboelectric Energy Harvesting Nighttime Running Vest 2021
Advisor, SUNY Alfred State Alfred, NY

A26. MEMS Tilt Sensors 2020
Advisor, SUNY Alfred State Alfred, NY

A25. PCB-based Tilt Sensors 2020
Advisor, SUNY Alfred State Alfred, NY

A24. Microfluidic Pressure Sensor Array Chip 2020
Advisor, SUNY Alfred State Alfred, NY

A23. Automatic Sorting Pneumatic Can Crusher 2020
Advisor, SUNY Alfred State Alfred, NY

A22. Ferrofluid-Based Visual Magnetometer 2019
Advisor, SUNY Alfred State Alfred, NY

A21. Multi-Directional Universal Energy Harvesting Ball 2019
Advisor, SUNY Alfred State Alfred, NY

A20. Ferrofluid-Based Tilt Sensor 2019
Advisor, SUNY Alfred State Alfred, NY

A19. Ferrofluid-Based Force Sensor 2019
Advisor, SUNY Alfred State Alfred, NY

A18. Magnetic and Shape Memory Alloy Gripper 2019
Advisor, SUNY Alfred State Alfred, NY

A17. Miniature Shape Memory Alloy based flow control valve 2019
Advisor, SUNY Alfred State Alfred, NY

A16. Miniature Ferrofluid Based Solenoid Valve 2019
Advisor, SUNY Alfred State Alfred, NY

A15. Ferrofluid-Based Valve-less Pump 2019
Advisor, SUNY Alfred State Alfred, NY

A14. Piezoelectric and Inductive Rotational Energy Harvester 2019
Advisor, SUNY Alfred State Alfred, NY

A13. Laser-Patterned Polymers for Sensing Applications 2018
Investigator, SUNY Alfred State Alfred, NY

A12. Flexible Capacitive Sensor for Biomedical Applications 2018
Investigator, SUNY Alfred State Alfred, NY

A11. MEMS Capacitive Sensor for Wound Monitoring Applications 2018
Advisor, SUNY Alfred State Alfred, NY

A10. Paper-based Sensing Device for Structural Health Monitoring 2018
Advisor, SUNY Alfred State Alfred, NY

A9. Piezoelectric Energy Harvesting in Typing Applications 2018
Advisor, SUNY Alfred State Alfred, NY

A8. Piezoelectric-based Monitoring of Restless Legs Syndrome (RLS) 2018

Advisor, SUNY Alfred State — Alfred, NY

A7. Electrical Switch Device based on Graphite on Paper Strain Sensing Functionality — 2018
Advisor, SUNY Alfred State — Alfred, NY

A6. Graphite on Paper as Aqueous Chemical Sensor — 2018
Advisor, SUNY Alfred State — Alfred, NY

A5. 3D Printed Micro Check Valve for Biomedical Applications — 2018
Advisor, SUNY Alfred State — Alfred, NY

A4. Paper-based Force Sensor — 2018
Advisor, SUNY Alfred State — Alfred, NY

A3. High Performance 3D Printed Tesla Check Valve — 2018
Advisor, SUNY Alfred State — Alfred, NY

A2. Rotational Energy Harvester Using Piezoelectric Beams — 2017
Advisor, SUNY Alfred State — Alfred, NY

A1. Miniature 3D printed Electrochemical Accelerometer — 2017
Advisor, SUNY Alfred State — Alfred, NY

SELECETED INDUSTRIAL / ACADEMIC PROJECTS (Funded by Companies or Universities)

P15. FEM Simulation of Stress and Distortion in Gas Turbine Weldments Using Sysweld and Weld Planner, Supporting Design and Service Groups — 2011-2016
Engineer, Siemens Energy — Charlotte, NC

P14. Superclean Rotor Repair Using Laser Welding: Experimental and Computational Modeling — 2013-2016
Engineer, Siemens Energy — Charlotte, NC

P13. Optimization of Heat Treatment Process of Compressor Diaphragms — 2014
Engineer, Siemens Energy — Charlotte, NC

P12. Root Cause Failure Analysis of Gas Turbine Components — 2011-2016
Senior Engineer, Siemens Energy — Charlotte, NC

P11. Lifetime Evaluation of Gas Turbine Blades and Vanes — 2011-2016
Senior Engineer, Siemens Energy — Charlotte, NC

P10. Development of Smart Stents Using Micro-Electro-Discharge-Machining (μEDM) and Laser Cutting Techniques for Wirelessly Monitoring Blood Flow/Pressure in Coronary Arteries — 2011
Postdoctoral Fellow, Electrical and Computer Engineering, University of British Columbia — Vancouver, BC

P9. Development of a Custom Electropolishing System for Biomedical Devices — 2011
Postdoctoral Fellow, Electrical and Computer Engineering, University of British Columbia — Vancouver, BC

P8. Monitoring Coiled Cerebral Aneurysms Using a Wireless Sensory System — 2011
Postdoctoral Fellow, Electrical and Computer Engineering, University of British Columbia — Vancouver, BC

P7. Development of MEMS Pressure, Temperature and Liquid Conductivity Micro-sensors as Components of a Smart Flow-Following Sensor Package for High-Temperature and Harsh Environments of Multi-phase Chemical Reactors — 2006-2010
Research Assistant, Mechanical Engineering, University of British Columbia — Vancouver, BC

P6. Development of Varistor Blocks Used in Power Distribution and Transmission Lines — 2002-2005
Project Manager, Niroo Research Institute — Tehran, Iran

P5. Failure Analysis of Gas Turbine Blades — 2001-2002
Project Manager, Niroo Research Institute — Tehran, Iran

P4. Remaining Life Assessment of Gas Turbine Blades and Vanes — 2000-2001
Project Manager, Niroo Research Institute — Tehran, Iran

P3. Failure Analysis of Thermal Power Plant Boiler Tubes — 1997-1998
Research Engineer, Niroo Research Institute — Tehran, Iran

P2. Feasibility Study on Manufacturing Method Substitution of Gas Turbine Blades 1996-1997
Research Engineer, Electric Power Research Center Tehran, Iran

P1. Development of Alkaline Fuel Cell Electrodes 1993-1995
Electric Power Research Center Tehran, Iran

PROFESSIONAL ACTIVITIES

Technical Reviewer (2008-Present)

- Research Papers, Energy Conversion and Management
- Research Papers, Journal of Micromechanics and Microengineering
- Research Papers, IEEE MEMS Journal
- Research Papers, IEEE Sensors Journal
- Research Papers, Smart Materials & Structure
- Research Papers, Sensors and Actuators A: Physical - Elsevier
- National Funding Proposals, Romanian National Council for Scientific Research
- Research Papers, Scientific Research and Essays
- Research Papers, Journal of Electrical Science and Engineering
- Research Papers, International Power System Conference

Conference Committee Member and Chair

- SEIA' 2022, 8th International Conference on Sensors and Electronic Instrumental Advances, September 21-23, 2022, Corfu, Greece
- ALLSENSORS 2022, 7th International Conference on Advances in Sensors, Actuators, Metering and Sensing, June 26-30, 2022, Porto, Portugal
- SEIA' 2021, 7th International Conference on Sensors and Electronic Instrumental Advances, September 22-24, 2021, Palma De Mallorca, Mallorca, Spain
- ALLSENSORS 2021, 6th International Conference on Advances in Sensors, Actuators, Metering and Sensing, July 18-22, 2021, Nice, France
- SEIA' 2020, 6th International Conference on Sensors and Electronic Instrumental Advances, September 23-25, 2020, Porto, Portugal
- ALLSENSORS 2020, 5th International Conference on Advances in Sensors, Actuators, Metering and Sensing, November 21-25, 2020, Valencia, Spain
- SEIA' 2019, 5th International Conference on Sensors and Electronic Instrumental Advances, September 25-27, 2019, Canary Islands, Spain
- ALLSENSORS 2019, 4th International Conference on Advances in Sensors, Actuators, Metering and Sensing, February 24-28, 2019, Athens, Greece
- AUenergy Symposium, 2018 symposium on power grids and generation
- SEIA' 2018, 4th International Conference on Sensors and Electronic Instrumental Advances, September 19-21, 2018, Amsterdam, Netherlands
- ICMMR 2018, 5th International Conference on Mechanics and Mechatronics Research July 19-21, 2018, Tokyo, Japan
- ALLSENSORS 2018, 3rd International Conference on Advances in Sensors, Actuators, Metering and Sensing, March 25-29, 2018, Rome, Italy
- SEIA' 2017, 3rd International Conference on Sensors and Electronic Instrumental Advances, September 20-22, 2017, Moscow, Russia
- ALLSENSORS 2017, 2nd International Conference on Advances in Sensors, Actuators, Metering and Sensing, March 19-23, 2017, Nice, France
- SEIA' 2016, 2nd International Conference on Sensors and Electronic Instrumental Advances, September 22-23, 2016, Barcelona, Spain
- ALLSENSORS 2016, 1st International Conference on Advances in Sensors, Actuators, Metering and Sensing, April 24-28, 2016, Venice, Italy
- SEIA' 2015, 1st International Conference on Sensors Engineering and Electronics Instrumental Advances, In conjunction with 1st International Workshop on Recent Advances on Electrical, Sensors and Transducers Equipment, November 21-22, 2015, Dubai, UAE
- Volunteer, ASME International Mechanical Engineering Congress, Vancouver, BC, 2010
- Chair, Seminar of Heat Exchangers of Thermal Power Plants, Tehran, Iran, 2000
- Executive Board and Head of Workshops, 14th International Power System Conference, Tehran, Iran, 1999

HONORS AND AWARDS

•**2022 Allegany County Startup Collegiate Competition** – Won Grand Prize		2022
•**2021 Allegany County Startup Collegiate Competition** – Ranked 3rd place		2021
•**Travel Grant (Alfred State)**	(More than $8,000)	2016-2020
•**Industrial R&D Postdoctoral Fellowship** – Pre-approved by NSERC	($40,000/year)	2011-2013
•**BC Innovation Council Award** – University of British Columbia	($75,000)	2011
•**Ph.D Tuition Full Scholarship** – University of British Columbia	($4,000/year)	2006-2010
•**Canada Study Grant** – University of British Columbia	($2,000/year)	2006-2010
•**Travel Awards for Three Conference Presentations** – Niroo Research Institute	($6,000)	2000-2005

MEMBERSHIPS

•**Member –** American Society of Mechanical Engineers (ASME)	2010-2012
•**Member –** American Society of Materials (ASM)	2013-2017
•**Member -** Canadian Microelectronics Corporation (CMC), Canada	2007-2011
•**Member -** Microsystems and Nanotechnology Group (MiNa), U. of British Columbia, Vancouver, Canada	2007-2011

TECHNICAL SKILLS

Computer Applications

- Experienced with CAD (Solidworks, L-Edit and Ultiboard)
- Experienced with FEM computational modeling (COMSOL Multiphysics, Sysweld, and Weld Planner)
- Experienced with MATLAB
- Experienced with LabVIEW
- Experienced with coding machines (EDM G-code programming)

Engineering

- More than 1500 hrs experience in class 1000 and 10000 cleanroom
- Expert in metal, semiconductor and dielectric deposition using thermal and electron-beam and sputtering techniques
- Expert in photolithography, wet and dry chemical etching, and lift-off patterning
- Experienced with electrochemical polishing and plating
- Experienced with working with chemicals used in cleanroom
- Experienced with µ-EDM machine
- Experienced with laser patterning machine
- Experienced with parylene and silicone coating
- Experienced with optical lithography mask design
- Expert in sensor design and characterization
- Experienced with electrical characterization of sensor devices (device probing, I-V, inductance and capacitance-voltage measurements)
- Experienced with wire bonding techniques
- Experienced with machine shop
- Expert in materials tests: metallography (image analysis, SEM, EDS etc.) and mechanical testing (tensile strength, hardness, bending, creep, fatigue, impact, fracture etc.)