

REZA RASHIDI, PhD

Associate Professor of Practice (Primary) | Research Associate Professor (Secondary)

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PROFESSIONAL PROFILE

Mechanical engineering educator, curriculum leader, and applied researcher with interests spanning engineering design, project-based engineering education, AI-enabled engineering, mechanical design, smart structures and sensors, energy harvesting, mechanical metamaterials, advanced manufacturing, and intelligent physical systems. Ten years of faculty teaching and academic leadership, including current appointments at the University at Buffalo and prior service as department chair at SUNY Alfred, complemented by substantial industrial engineering experience at Siemens Energy. Current work combines engineering education, applied research, student mentoring, AI-enabled design, and industry-sponsored engineering projects.

AREAS OF EXPERTISE

- AI-enabled engineering design & decision support
- Human-AI collaboration, robotics & embedded-system integration
- Mechanical metamaterials & architected structures
- Project-based engineering education, curriculum design & ABET assessment
- Mechanical design, FEA, advanced manufacturing & product development
- Sensors and actuators, PZT/smart structures, energy harvesting, MEMS & SHM

EDUCATION

- PhD, Mechanical Engineering** May 2011
University of British Columbia, Vancouver, BC
 - Dissertation: MEMS Pressure, Temperature and Conductivity Sensor Devices (SmartChip) for High-Temperature and Harsh Environments.
- MS, Materials Engineering** Aug 1995
University of Tehran, Tehran, Iran
 - Thesis: Development of Electrodes for Alkaline Fuel Cells.
- BS, Materials Engineering** Aug 1993
Sharif University of Technology, Tehran, Iran
 - Senior work: Coupled experimental-numerical validation of SUTCAST heat-transfer simulations for metal solidification (FEM/FDM).

ACADEMIC AND INDUSTRY APPOINTMENTS

- Associate Professor of Practice (Primary) / Research Associate Professor (Secondary)** Jan 2023-Present / Jul 2026-Present
Department of Mechanical and Aerospace Engineering,
University at Buffalo (SUNY)
 - Coordinate and continuously redesign MAE 451 / MAE 494, a two-course senior design sequence serving more than 200 students annually across large fall and spring cohorts.
 - Lead and co-mentor AI-enabled engineering design, mechanical metamaterials, orthodontic-device, piezoelectric/smart-system, and industry-sponsored senior-design projects.
- Associate Professor and Chair, Department of Mechanical & Electrical Engineering Technology** Jan 2021-Jan 2023
SUNY Alfred, Alfred, NY
 - Led an engineering department spanning mechatronics, mechanical, electrical, and computer engineering technology programs.
 - Coordinated multidisciplinary senior projects; in Fall 2022, all 13 senior projects were fully industry-sponsored, and the semester included the first Fall senior-project poster presentation and a project showcase during the 2022 Pioneer Walk.
 - Oversaw curriculum, faculty, laboratories, student projects, assessment, and industry engagement while continuing teaching and applied research.
- Assistant Professor, Department of Mechanical & Electrical Engineering Technology** Sep 2016-Dec 2020
SUNY Alfred, Alfred, NY
 - Taught mechanics of materials, engineering computing, sensors/actuators, microfabrication, MEMS, and senior design; developed new courses and laboratories and mentored student research that produced refereed publications.
- Senior Engineer, Gas Turbine - FEA, Design, Materials, and Failure Analysis** Nov 2011-Aug 2016
Siemens Energy, Charlotte, NC
 - Applied finite element analysis, mechanical design, materials engineering, and failure analysis to industrial gas turbine components and engineering problems.

Postdoctoral Fellow, Department of Electrical & Computer Engineering

Jan-Nov 2011

University of British Columbia, Vancouver, BC

Research Assistant / Teaching Assistant

Sep 2006-Dec 2010 / Sep 2008-Dec 2009

University of British Columbia, Vancouver, BC

Director and Faculty Member, Chemistry and Materials Center

2000-2006

Niroo Research Institute (NRI), Tehran, Iran

- Directed applied product-development projects and prepared technical reports and funding proposals.
- Led commercialization activities for four developed products.
- Supervised reference laboratories implementing ISO/IEC 17025 requirements.

Vice President for Training and Education and Faculty Member

1998-2000

Niroo Research Institute (NRI), Tehran, Iran

- Led professional training and education programs for engineering and industry personnel.
- Developed short-term technical courses for industry employees.
- Helped develop joint master's-degree programs with universities in Mechanical and Electrical Engineering.

TEACHING AND CURRICULUM LEADERSHIP**University at Buffalo - Current Teaching****MAE 451 - Design Process and Methods (redesigned)**

Fall 2023 (214); Spring 2024 (18); Fall 2024 (198); Spring 2025 (30); Fall 2025 (135); Fall 2026 (three sections).

MAE 494 - Senior Design Project (redesigned)

Spring 2023 (98); Spring 2024 (177); Fall 2024 (18); Spring 2025 (194); Fall 2025 (24); Spring 2026 (133).

MAE 498 - Undergraduate Research & Creative Activity

Faculty-supervised research in engineering design, mechanical systems, sensing, manufacturing, smart structures, and educational innovation.

MAE 501 – Graduate Individual Problems

Faculty-supervised graduate independent study and research in advanced engineering analysis, design, modeling, experimentation, and technical communication.

Teaching and Curriculum Innovation

- Project-centered, flipped senior design: structured milestones, in-class design work, technical reviews, sponsor interaction, peer/instructor feedback, prototype development, testing, and evidence-based verification.
- Integrates AI-supported engineering education and collaborative OER development into design, robotics, and embedded-systems curricula, with emphasis on human-guided AI, accessible instructional resources, and scalable project-based learning.
- Established recurring senior-design poster presentations and prototype demonstration events; developed sponsor/project solicitation workflows and strengthened earlier purchasing, facilities, competition, and multidisciplinary project infrastructure.

Previous Courses - SUNY Alfred

BSET 8003 Senior Project (redesigned); BSET 7001 Senior Seminar and Project Design (redesigned); MECH 7403 Microfabrication (new course and lab); MECH 5900 MEMS Development (new course); MECH 5900 Sensors & Actuators; MECH 5334 Mechanics of Materials; ENGR 2201 Engineering Science Seminar; ENGR 2001 Engineering Computing Applications (MATLAB).

SELECTED AI-ENABLED ENGINEERING AND EDUCATION INITIATIVES**AI-Enabled Open Instructional System for Accessible and Scalable Engineering Design - PI, 2026-2027**

- SUNY-funded development of an AI-guided engineering-design support system integrated with openly licensed instructional resources for MAE 451 / MAE 494. The 14-module framework supports engineering-method selection, alternatives and trade-offs, design justification, reflection, and scalable project-based learning while preserving student responsibility and faculty oversight.
- Interdisciplinary student team: Hadley Douglas (MAE), Bryce Lin and Sai Krishna Arthanari (CSE); co-advising with Dr. Roshan Ayyalasomayajula (CSE).

AI-Enabled Senior Design and Intelligent-System Projects - 2023–Present

- Senior design applications include AI-assisted piezoelectric energy harvesters, an autonomous AI-based laser weeder, and an AI-generated interactive music-lighting system incorporating neural networks, live-audio classification, embedded control, robotics, and hardware/software integration.

AI-Driven Robotics and Distributed Embedded Control - Collaborative Research, 2025–Present

- Collaboration with SUNY Buffalo State on autonomous solar-panel inspection and maintenance, AI-enabled image recognition, robotic cleaning, embedded systems, distributed multi-agent control, MATLAB simulation, and Raspberry Pi implementation; contributions focus on mechanical and robotic integration and physical-system validation.

ACADEMIC LEADERSHIP, MENTORING, AND SERVICE

- ABET Coordinator / Lead, MAE ABET assessment: outcome review, accreditation preparation, evidence collection, ABET visit presentation and meeting, and continuous improvement.
- Director, Senior Design Lab; secured and developed three dedicated spaces for design, fabrication, integration, testing, and competition work.
- Coordinator, MAE Senior Design Sequence, Jan 2023-Present; Chair, Ad Hoc Committee for the MAE Senior Design Sequence, Jan 2023-Spring 2024.
- University Senate Senator, University at Buffalo, Aug 2026-Present; member, MAE Undergraduate Studies Committee; prior member, SEAS New Engineering Building Development committee.
- Faculty advisor to approximately 18-28 undergraduate students annually and mentor to graduate/undergraduate research teams spanning MAE, CSE, engineering technology, and external partners.

Student Team Awards as Faculty Advisor

2026 - 1st Place, NAVY Promoting Electric Propulsion Competition - displacement category, Virginia Beach, VA.

2025 - 1st Place, NAVY Promoting Electric Propulsion Competition - displacement category, Virginia Beach, VA.

2025 - NASA Lunabotics - Best First-Year Presentation, Orlando, FL.

2025 - People's Choice Award, Panasci Technology Entrepreneurship Competition - Laser Weeders for Small-Scale Farms, Buffalo, NY.

2024 - 3rd Place, NAVY Promoting Electric Propulsion Competition - displacement category, Virginia Beach, VA.

2022 - 1st Place, Allegany County Startup Collegiate Competition.

2021 - 3rd Place, Allegany County Startup Collegiate Competition.

CURRENT RESEARCH AREAS AND STUDENT TEAMS

1. AI-Enabled Engineering Design, Intelligent Systems, and Engineering Education

- Research in AI-assisted engineering design and decision support, intelligent physical systems, robotics, distributed embedded control, and AI-enhanced project-based engineering education.
- Current student researchers and collaborators: Hadley Douglas (MAE); Bryce Lin and Sai Krishna Arthanari (CSE); co-advising with Dr. Roshan Ayyalasomayajula (CSE); collaboration with Dr. Maryam Nasri at SUNY Buffalo State University.

2. Mechanical Metamaterials and Architected Structures

- Design, modeling, fabrication, and experimental investigation of reconfigurable, multistable, and mechanically intelligent structures, including state-dependent behavior, mechanical memory, nonlinear response, and disorder-tolerant architectures.
- Current student researchers: Jeremy Kandler (M.S.); Brandon Alcera, Zachary Walsh, Joedarney Gaston, George Zou, and Musleh Saeed (undergraduate researchers).

3. Advanced Manufacturing and Biomedical Device Design

- Design and manufacturing of customized biomedical and mechanical components using conventional and advanced fabrication methods, supported by CAD, FEA, dimensional characterization, mechanical testing, and design optimization. Current work includes customizable metallic and polymeric orthodontic brackets.
- Current student researchers: Mahdi Howlader (M.S.), metallic orthodontic brackets; Piyush Ohri, polymeric orthodontic brackets. Collaboration with Dr. Ashish Gurav and Steven Makowka.

4. Smart Structures, Sensors, and Energy-Harvesting Systems

- Research in piezoelectric systems, sensing and actuation, structural-health monitoring, energy harvesting, and self-powered or intelligent mechanical systems.
- Current student work includes piezoelectric energy-harvesting and smart-system design.

FUNDING AND SPONSORED PROGRAM SUPPORT

Current / Recent Competitive and Institutional Support

- SUNY Academic Innovation Grant - AI-Enabled Open Instructional System for Accessible and Scalable Engineering Design, PI, 2026-2027, \$30,000 (plus \$7,600 institutional cost share).
- Senior Design Lab Upgrade, Center for Industrial Effectiveness (TCIE), 2023-2024, \$50,000.
- Design Validation and Material Selection of Navy Field Boxes, industry project through TCIE, 2024, \$15,000.
- SUNY Alfred instructional equipment purchase support, 2016-2022, approximately \$80,000.
- SUNY Alfred Research Applied Learning Fund, 2016-2022, approximately \$20,000.
- Canadian Microsystems research support (two projects), 2008, \$20,000 total; contributed to proposal preparation as a graduate researcher.

Industry / Competition / Senior Design Sponsorship

- GlobalFoundries senior design sponsorship, \$22,000 cumulative.
- Promoting Electric Propulsion (American Society of Naval Engineers / Office of Naval Research), \$44,000 cumulative support.
- More than 10 sponsored senior-design projects annually in recent cycles, with additional hardware, software, and technical support provided by industry and community partners.

PUBLICATIONS AND TECHNICAL PRESENTATIONS

Google Scholar: <https://scholar.google.com/citations?user=TJLkLIEAAAAJ&hl=en> | * graduate student; + undergraduate student

Refereed Journal Articles

1. A.J. Hildreth+, R. Rashidi, M. Nasri, N. Amiri, O.C. Manley+, D. DeFord+, D. Tantal+, D. Albicker+, and J. Clement+, "Integrated Piezoelectric Sensing and Actuation System for Guided-Wave Crack Detection and On-Demand Repair in Steel Structures," *Actuators*, 15(10), 513, 2026.
2. R. Hall+ and R. Rashidi, "Multi-directional universal energy harvesting ball," *Micromachines*, 12(4), 457, 2021.
3. J. Martin+ and R. Rashidi, "A differential transformer-based force sensor utilizing a magnetic fluid core," *Microsystem Technologies*, 27(1), 115-126, 2021.
4. T. Coughlin+ and R. Rashidi, "A powerless iron oxide based magnetometer," *Microsystem Technologies*, 26, 2487-2498, 2020.
5. A. DeGraff+ and R. Rashidi, "Ferrofluid transformer-based tilt sensor," *Microsystem Technologies*, 26, 2499-2506, 2020.
6. R. Rashidi, N. Summerville+, and M. Nasri, "Magnetically actuated piezoelectric-based rotational energy harvester with enhanced output in a wide range of rotating speeds," *IEEE Transactions on Magnetics*, 55(9), 1-8, 2019.
7. R. Rashidi, J. Alenezi+, J. Czechowski+, J. Niver+, and S. Mohammad+, "Graphite-on-paper-based resistive sensing device for aqueous chemical identification," *Chemical Papers*, 73(11), 2845-2855, 2019.
8. 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), 025015, 2013.
9. 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), 349-356, 2012.
10. 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), 2738-2746, 2012.
11. 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, 300-305, 2011.
12. D. Brox*, R. Rashidi, and K. Takahata, "A non-lithographically microfabricated capacitive pressure sensor for biomedical applications," *Electronics Letters*, 47(18), 1015-1017, 2011.
13. 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), 015009, 2011.
14. 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), 149-160, 2011.
15. 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), 471-480, 2010.
16. M.H. Pishbin, R. Rashidi, and M. Nasri, "Optimization of manufacturing parameters for Ni-Ag fuel cell electrode," *Fuel Cells*, 7(4), 291-297, 2007.
17. M. Mohandes and R. Rashidi, "Variables affecting the fabrication and glazing of zinc oxide varistor blocks," *Journal of Electrical Science and Engineering*, 44, 43-54, 2005 (Persian).
18. A. Zhaam and R. Rashidi, "Corrosion and its prevention methods in thermal power plants," *Journal of Electrical Science and Engineering*, 25, 1-7, 1998 (Persian).

Invited / Other Articles

1. R. Rashidi, R. Lohr+, and T. Sax+, "Triboelectric Energy Harvester for Self-Powered Nighttime Running Vest," SSRN 4713841, February 2024.
2. R. Rashidi, "MEMS piezoresistive pressure sensor for high-temperature applications," CMC Microsystems, online application note, 2010.
3. R. Rashidi, "Packaging of MEMS pressure sensors for harsh environments," CMC Microsystems, online application note, 2010.
4. R. Rashidi, "Superalloys used in gas turbine blades," MATN-PAYAM, 23, 17-20, 1997 (Persian).

Refereed Proceedings Articles

1. R. Rashidi, "Project-Centered Flipped Senior Design (UB-PCFSD): Multi-Year Redesign and Outcomes in a Two-Course Capstone Sequence," 2026 ASEE Annual Conference & Exposition, Charlotte, NC, June 2026.
2. R. Rashidi, "Redesigning Senior Capstone Sequence with Multidisciplinary, Industry-Sponsored Projects," 2023 ASEE Annual Conference & Exposition, Baltimore, MD, June 2023.
3. M.A. Palmateer+, J. Plesums+, R. Santiago+, A. Miller+, and R. Rashidi, "3D-Printed Piezoelectric Acoustic Energy Harvester," 2023 ASEE Annual Conference & Exposition, Baltimore, MD, June 2023.
4. G. Bathgate+, D. Perlino+, C. Howard+, O. Frink+, and R. Rashidi, "Fabrication of Fluidic Devices through Dissolution of 3D Printed Material in PDMS Mold," 2023 ASEE Annual Conference & Exposition, Baltimore, MD, June 2023.
5. 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, November 2021.

6. 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," 2020 ASEE Annual Conference and Exposition, Montreal, Canada, June 2020.
7. 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, November 2019.
8. 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, November 2019.
9. J. Bianconi+, J. Hallett+, J. Pealo+, and R. Rashidi, "A hybrid piezoelectric and inductive rotational energy harvester," 6th International Conference on Mechanics and Mechatronics Research, Chongqing, China, July 2019.
10. 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, October 2018.
11. K. Bower+, R. Colon+, C. Karnyski+, J. Minkel+, and R. Rashidi, "Piezoelectric-based monitoring of restless legs syndrome (RLS)," International Conference on Mechatronics and Intelligent Robotics, Kunming, China, May 2018.
12. J. Alenezi+, J. Czechowski+, J. Niver+, S. Mohammad+, and R. Rashidi, "Graphite Line on Paper as an Aqueous Chemical Sensor," International Conference on Mechatronics and Intelligent Robotics, Kunming, China, May 2018.
13. T. Duell+, M. Muehlbauer+, T. Seitzinger+, J. Westfall+, and R. Rashidi, "MEMS Capacitive Sensor for Wound Monitoring Applications," 5th International Conference on Mechanics and Mechatronics Research, Tokyo, Japan, July 2018.
14. A. Mbaye+, C. Kreamer+, L. Zink+, M. Fredenburg+, and R. Rashidi, "3D Printed Micro Check Valve for Biomedical Applications," 5th International Conference on Mechanics and Mechatronics Research, Tokyo, Japan, July 2018.
15. D. Brox*, R. Rashidi, and K. Takahata, "Non-Lithographically Micromachined Capacitive Pressure Sensor Based on Stainless Steel for Biomedical Applications," IEEE Sensors, Limerick, Ireland, October 2011.
16. R. Rashidi and M. Chiao, "A simple method for adhesive bonding of capacitive pressure sensors," ASME International Mechanical Engineering Congress, Vancouver, Canada, November 2010.
17. T.C.M. Graham, E. Liu*, R. Rashidi, N. Sadeghi*, E. Albadvi*, S. Mirabbasi, M. Chiao, J.D. Madden, and C.P.J. Bennington, "Development of a flow-following sensor package for application in chemical pulp digesters," EXFOR & Annual Meeting, Montreal, Canada, February 2010, pp. 51-59.
18. R. Rashidi and A. Zhaam, "Study on corrosion of thermal power plant condenser tubes," EUROCORR 2004, Nice, France, September 2004, pp. 12-16.
19. R. Rashidi and A. Zhaam, "Study and production of fuel cell electrodes," ISATA 2000, Dublin, Ireland, September 2000, pp. 25-27.
20. R. Rashidi+, "A simulation for effect of chill thickness on solidification rate," 4th National Congress of Foundry Directors, China Foundry Association, Beijing, China, May 2000, pp. 5-7.
21. 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).

Other Conference Presentation

1. R. Rashidi and N. Summerville+, "Piezoelectric energy harvesters for rotational applications," AUenergy Symposium, Alfred, NY, October 2018.

STUDENT MENTORING RESULTING IN PUBLICATIONS

1. **Wireless monitoring of blood pressure inside a stent**
D. Brox, University of British Columbia, PhD work, 2011; co-advisor (primary advisor: K. Takahata); journal and conference publications.
2. **Integrated piezoelectric crack detection and on-demand repair in steel structures**
Andrew Hildreth, Olivia Manley, Dan DeFord, Danny Tantalo, Dylan Albicker, and Joe Clement, University at Buffalo, Senior Design, 2025-2026; resulting Actuators journal article published in 2026.
3. **3D-Printed Piezoelectric Acoustic Energy Harvester**
M.A. Palmateer, J. Plesums, R. Santiago, and A. Miller, SUNY Alfred, Senior Design, 2022; ASEE conference paper.
4. **Fluidic devices through dissolution of 3D-printed material in PDMS mold**
G. Bathgate, D. Perlino, C. Howard, and O. Frink, SUNY Alfred, Senior Design, 2020; ASEE conference paper.
5. **Triboelectric energy harvester for self-powered nighttime running vest**
R. Lohr and T. Sax, SUNY Alfred, Independent Study, 2020; online paper.
6. **Triboelectric-based energy-harvesting facemask using recyclable materials**
B. Miller and S. Barker, SUNY Alfred, Independent Study, 2020; conference paper.
7. **Multi-directional energy harvesting ball**
R. Hall, SUNY Alfred, Independent Study, 2019; journal paper.
8. **Differential transformer-based force sensor using magnetic fluid**
J. Martin, SUNY Alfred, Independent Study, 2019; journal paper.
9. **Ferrofluid transformer-based tilt sensor**
A. DeGraff, SUNY Alfred, Independent Study, 2019; journal paper.

10. Powerless iron-oxide magnetometer

T. Coughlin, SUNY Alfred, Independent Study, 2019; journal paper.

11. Microfabrication of microfluidic pressure sensor arrays

A. Bailey and T. Michelson, SUNY Alfred, Independent Study, 2019; conference paper.

12. Magnetic and shape-memory-alloy actuated gripper

I. Cooke, B. DeClerck, J. Hallett, T. Miller, and A. Mitchell, SUNY Alfred, Senior Design, 2019; conference paper.

13. Ferrofluid valve-less pump

T. Michelson, J. Rudnick, and J. Baxter, SUNY Alfred, Senior Design, 2019; conference paper.

14. Hybrid piezoelectric and inductive rotational energy harvester

J. Bianconi, J. Hallett, and J. Pealo, SUNY Alfred, Senior Design, 2019; conference paper.

15. Piezoelectric-based rotational energy harvester

N. Summerville, SUNY Alfred, Senior Design, 2018; journal and conference publications.

16. Graphite-on-paper aqueous chemical sensor

J. Alenezi, J. Czechowski, J. Niver, and S. Mohammad, SUNY Alfred, Senior Design, 2018; journal and conference publications.

17. MEMS capacitive sensor for wound monitoring

T. Duell, M. Muehlbauer, T. Seitzinger, and J. Westfall, SUNY Alfred, Senior Design, 2018; conference paper.

18. 3D-printed micro check valve for biomedical applications

A. Mbaye, C. Kreamer, L. Zink, and M. Fredenburg, SUNY Alfred, Senior Design, 2018; conference paper.

19. Electrochemical polishing of micro-EDM stainless-steel stents

D. Lappin, University of British Columbia, Independent Study, 2011; co-advisor (primary advisor: K. Takahata); journal paper.

SELECTED INDUSTRY-SPONSORED AND MULTIDISCIPLINARY SENIOR DESIGN PROJECTS

Coordinated or advised more than 50 industry-sponsored and multidisciplinary engineering projects. Representative projects are listed below; recent work spans semiconductor manufacturing, automation, robotics, energy, museums, biomedical systems, infrastructure, and national competitions.

1. ASML Scanner Ultra-Pure Water Bath-Level Monitoring - GlobalFoundries, 2025-2026.
2. Polyimide Cup-Wash Disk Redesign - GlobalFoundries, 2025-2026.
3. Can-Lid Component for Spooling Machine - Eastman Kodak, 2024-2025.
4. Pulse-Oxidation Water-Disinfection System Redesign - Oxi-Tech America, 2024-2025.
5. Surgery Lamp Automatically Tracking a Surgeon's Hands - Center for Plastic Surgery, 2024-2025.
6. Bell X-22 Interactive Ducted-Fan Exhibit - Niagara Aerospace Museum; multidisciplinary MAE/CSE team, 2023-2025.
7. Interactive Wind Tunnel - Niagara Aerospace Museum, 2023-2024.
8. Pump Test Stand - Moog, 2023-2024.
9. Sheet-Metal Flattening Equipment Automation - Niagara Specialty Metals, 2023-2024.
10. SUNY Alfred Fall 2022 portfolio - 13 fully industry-sponsored multidisciplinary senior projects across mechatronics, mechanical, electrical, and computer engineering technology; partners included Jabil, Moog, National Grid, Siemens Energy, HDM Hydraulics, Encorus, FLICK, IBC, Pathfinder, Patriot, ASC, and SAE Baja.
11. FANUC robot-based semi-automated welding system - HDM Hydraulics, 2021-2022.
12. Semi-automated isolator machine optimization using Stage-Gate/DMAIC - Eaton, 2021-2022.
13. Farm biogas digester prototype - Atlantic Ocean Aquaculture / SUNY Alfred, 2021-2022.
14. Robotic automation of engineering processes, including 3D modeling and electrical design - Adaptec Solutions, 2021-2022.

PROFESSIONAL SERVICE AND EDITORIAL LEADERSHIP

Guest Editor, Actuators (MDPI), 2026-Present. Special Issue: Artificial Intelligence in Piezoelectric Systems and Smart Structures: Design, Actuation, Sensing, and Control. [Special Issue](#)

Peer Review

Reviewer (2008-Present) for journals, conferences, theses, and funding programs including Nature Communications; Energy Conversion and Management; Journal of Micromechanics and Microengineering; IEEE Sensors Journal; Smart Materials and Structures; Sensors and Actuators A: Physical; Measurement Science and Technology; ASEE Annual Conference & Exposition; Romanian National Council for Scientific Research; and other engineering venues.

Conference and Professional Service

Conference committee service includes SEIA (2015-2026), ALLSENSORS (2016-2023), ICMR 2018, and AUenergy Symposium 2018; earlier service includes ASME IMECE volunteer (2010), Chair of the Seminar of Heat Exchangers of Thermal Power Plants (2000), and Executive Board / Head of Workshops for the 14th International Power System Conference (1999).

Professional Memberships

American Society for Engineering Education (2023-Present); American Society of Mechanical Engineers (2010-2012); ASM International (2013-2017); CMC Microsystems (2007-2011).

SELECTED AWARDS AND FELLOWSHIPS

- \$40,000/year NSERC Industrial R&D Postdoctoral Fellowship for two years, 2011.
- \$75,000 British Columbia Innovation Council Award, Province of British Columbia, 2011.
- Full PhD tuition scholarship, University of British Columbia, 2006-2010.
- Canada Study Grant, Government of Canada, 2006-2010.

SELECTED MEDIA COVERAGE

- SUNY Alfred Public Media, "Dr. Rashidi making a big difference with small technology," July 2, 2021.
- Olean Times, "SUNY Alfred engineering students developing innovative energy harvesting devices," April 13, 2021.
- UBC Public Media, "UBC researchers devise new technology to monitor brain aneurysms," November 4, 2011.