Prof. Mohammad Mayyas, Ph.D.
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Objective: Aiming for a leadership role where I can apply my 15 years of experience in academic leadership, emphasizing industry-relevant innovation in engineering education. Dedicated to fostering collaboration and upholding excellence in applied teaching and research.

I. Academic Degrees

- **Ph.D.** in Mechanical Engineering
  University of Texas at Arlington, 2007

"*Methodologies for Automated Microassesmnly*", Ph.D Dissertation, University of Texas at Arlington, Publisher: UMI, Ann Arbor, MI. Number 3310640, 308 pages. (2008).

- **Master of Science** in Mechanical Engineering
  University of Texas at Arlington, 2004

"*Wafer surface reconstruction and characterization for motion compensation in a femtosecond laser micromachining system*", Master Thesis, University of Texas at Arlington, Publisher: UMI, Ann Arbor, MI. Number 1421283, 173 pages. (2004).

- **Bachelor of Science** in Mechanical Engineering, Industry Production
  Jordan University of Science & Technology, 2001
  "*Development and Experimentation Solar Tracking Control System*", Senior Design Project, Jordan University of Science and Technology, 2nd place winner presented to Jordan Engineering Association (2001).

II. Administrative and Leadership Positions

1. **Chair of Engineering Technology Department,** August 2024 - Present
   Miami University, Hamilton / Middletown / Oxford, OH. USA

- ☑ Lead diverse undergraduate and graduate programs, including:
  - Bachelor of Science in Applied Science (Electro-Mechanical, Mechanical, and Robotics Engineering Technology concentrations)
  - Associate degrees and microcredentials in engineering technology fields
- ☑ Direct curriculum development ensuring educational quality and relevance
- ☑ Recruit, mentor, and develop faculty to uphold high standards in teaching and research
- ☑ Ensure program accreditation and compliance with educational standards
- ☑ Facilitate industry partnerships to enhance co-op, internship, research & development, workforce development, and training opportunities for students
- ☑ Co-lead the renovation of the 300,000 sq. ft. Advanced Manufacturing Innovation Hub (AMIH)
- ☑ Oversee the integration of the Engineering Technology Department into AMIH, creating collaborative learning spaces with industry and Butler County commission partners

2. **Program Director and Founder, Robotics Engineering,** 2022- August 2024
   Bowling Green State University, School of Engineering, Bowling Green, OH. USA

- ☑ *Directed and founded robotics program, collaboratively creating curriculum in thrust areas like autonomous robotics, AI, biomedical technology, semiconductor manufacturing, dynamic and process control.*
- ☑ *Secured capital equipment fundings over a $1M and led the deployment of engineering curriculum facilities for BGSU in advanced control, Automated material handling, electronics, and advanced manufacturing systems.*
- ☑ *Played a pivotal role in leading faculty to restructure the college, culminating in the creation of a School of Engineering focused on various contemporary engineering disciplines.*
- ☑ *Contributed to the development of the unit's policies on merit, tenure, and promotion, as well as the evaluation of tenure track and teaching faculty.*

3. Program Director and Founder, Mechatronics Engineering Technology, 2013-present
Bowling Green State University, Department of Eng. Technologies

- ☑ *Directed and founded Mechatronics program, working in collaboration to develop specialized curriculum in thrust areas like Industrial robotics and process development in manufacturing.*
- ☑ *Secured capital equipment fundings over a $1M and led the development of advanced training and workforce development facilities, specializing in e-factory (Industrial 4.0 robotics and automation), integrated and additive manufacturing, Fanuc training, and mobile collaborative robotics.*
- ☑ *Effectively leveraged industry relationships and successfully secured over a $1M in in-kind donations from various prominent corporations.*
- ☑ *Oversaw academic budget management, encompassing fund allocation, compliance, cost control, financial planning, reporting, and risk management, while collaborating with research office and college to meet institutional goals.*
- ☑ *Effectively led searches and hired talented faculty members and offered faculty mentorship.*
- ☑ *Led summer camps and workshops, managed recruitment events, and oversaw multimedia marketing for promoting engineering and technology programs.*
- ☑ *Led faculty effectively in securing and renewing ABET accreditation for the Mechatronics Engineering Technology and Mechanical and Manufacturing Engineering programs.*
- ☑ *Collaborated with the school unit, faculty, and advising center to assist in student transfers, address degree plan concerns, and help develop graduation strategies for students.*
- ☑ *Conducted campaign tours and technology demonstrations for high-ranking state officials, industry leaders, collaborators, as well as student and family orientation.*
- ☑ *Assisted in advocating for the establishment of the Center of Advanced Manufacturing, in collaboration with Owens Community College and the University of Findlay.*
- ☑ *Collaborated with regional institutions to form a consortium focused on advanced manufacturing workforce development, representing Bowling Green State University in this initiative.*
- ☑ *Engage with corporate partners to garner support for corporate education, facilitate an industry advisory board program, and initiate collaborative research projects.*

4. **Regional Director of BEST Robotics,** 2015 – 2019
Falcon BEST Robotics Hub, Bowling Green State University

- ☑ *Successfully organized annual STEM competitions for middle and high schools, recruiting participation from 18+ schools across Ohio, Indiana, and Michigan.*
- ☑ *Managed staff, allocated resources, led marketing efforts, conducted recruitment, and secured sponsorships.*

5. **Director of Robotics Division– Full time,** 2011 – 2013
University of Texas Arlington Research Institute

a. *Headed the robotics division at the research institution, working in partnership with university faculty and leading a team of research scientists, post-docs, interns, and both graduate and undergraduate researchers in projects centered on assistive robotics and device technology.*

b. *Collaborated with research groups in both institutional and inter-institutional joint grant proposals and implementation, obtaining funding from a variety of agencies.*

c. *Demonstrated leadership and fostered collaboration by partnering with private sector companies to establish a joint research program, effectively securing various stages of SBIR and STTR grant.*

d. *Exercised a collaborative leadership approach with the administration and research team in developing a strategic plan focused on increasing research spending.*

III. Academic Positions

1. **Full Professor,** August 2024 – Present
Engineering Technology
Miami University, Hamilton / Middletown / Oxford, OH. USA

- ☑ *Advising/supervising students and teaching a course per academic semester.*

2. **Graduate Faculty member – Adjunct,** August 2024 – 2027
College of Engineering

- ☑ Teach graduate-level courses in Robotics and Engineering (excluding thesis/dissertation research)
- ☑ Serve on scholarly project, master's, and doctoral advisory committees
- ☑ Contribute to comprehensive examination committees
- ☑ Engage in collaborative research and quality instruction at the graduate level
- ☑ Support the academic community with a strong commitment to research and education

3. **Full Professor,** 2021 – August 2024
Associate Professor 2013 – 2021
School of Engineering: Robotics Engineering | Mechatronics Engineering Technology
Bowling Green State University, Bowling Green, OH. USA

- ☑ *Developed and taught hands-on courses in areas like advanced industry robot systems.*
- ☑ *Secured over $1M in external funding for STEM education and research.*
- ☑ *Supervised cross-disciplinary senior design projects for all engineering & technology programs.*

- ☑ *Supervised graduate students' theses and guided co-op students in industry.*
- ☑ *Granted tenure in 2019.*

4. **Senior Research Scientist,** 2011 – 2013
   Faculty Associate of Research, 2009 – 2011
   Research Associate (Post Doc), 2008 – 2009
   University of Texas at Arlington Research Institute/ Automation & Robotics Research Institute,

- ☑ *Engaged in research and development of funded projects focused on Microelectromechanical Systems (MEMS), precision manufacturing techniques, medical devices, soft robotics, and novel mechanisms design and modeling.*
- ☑ *Contributed to the establishment of Texas Micro factory's modular cleanroom facilities and oversaw the training of equipment for both internal and external users.*
- ☑ *Created innovative solutions for complex engineering problems, including vibration-based chip release, distributed MEMS-assisted silicon wafer mechanical planarization, and regenerative medicine bioenvironmental devices.*

5. **Special Faculty Member (Affiliate),** 2009 – 2013
   Associate Professor of Research (Affiliate), 2013 – 2016
   University of Texas - Arlington, Mech. & Aerospace Dept.,

- ☑ *Sustained relationships to further enhance international collaborations, including the creation of MOUs, joint engineering programs, faculty exchanges, and sponsorship of doctoral students.*
- ☑ *Overseeing and mentoring graduate students.*

6. **Hashemite University, Mechatronics Engineering Dept.**

- ☑ *Promoted collaborative research and educational partnerships between universities in Jordan and the University of Texas at Arlington.*

7. **Graduate Research Associate,** 2005 - 2007
   Graduate Teaching Assistant, 2004 - 2005
   Graduate Research Assistant, 2003 - 2004
   University of Texas at Arlington- Auto. & Robo. Research Institute, and Mech. & Aerospace Dept.,

- ☑ *Assisted in various undergraduate courses, encompassing Applied Engineering Mathematics and the Design and Modeling of Mechatronics.*
- ☑ *Contributed to several engineering projects, including work in the Laser Micromachining Lab, Robotics (MARS) Laboratory, Hot Embossing Laboratory, and Cleanroom Facilities.*
- ☑ *Offered consulting to research groups in the field of multi-physical computation through finite element modeling.*

8. **Graduate Teaching Assistant**
   Jordan University of Science & Technology, Mech. Eng. Dept., 2001 – 2002

- ☑ *Assisted in teaching the mechatronics and PLC laboratory and served as a teaching assistant for grading dynamics and vibration courses.*
- ☑ *Pursued a master's degree in mechanical engineering, specializing in Applied Engineering Mathematics.*

IV. Industry Positions

1. **General Board member for Industry Council on Material Handling Education (CICMHE) – Volunteer**
   Martial Handling Institute (MHI), USA, 2021-present

- ☑ *Coordinates the Student Day event for MODEX and PROMAT material handling and technology trade shows, attracting participation from over 300 students per year.*

2. **Engineering Intern (Finite Element Developer) – Full time**
   Technology Center, Rhodia Engineering Plastic, Freiburg, Germany, 2000-2001

- ☑ *Conducted computational analysis for the design of engineered plastic injection components used in automotive engines, including those utilized today by Audi and BMW.*

3. **Product Research and Development – Full time**
   Mayyas Pharmaceutical Inc., 1999 – 2002

- ☑ *Managed product packaging design and oversaw manufacturing sourcing, contributing to the successful marketing and launch of cosmetic and medical diagnostic device products.*

V. Technical Hands-on Skills

Robotics Equipment:

- **Industrial Robot Operation & Programming:** Expert in Mitsubishi and Fanuc systems.
- **Machine Vision:** Proficient in Cognex Insight and Deep Learning Cognex technologies.
- **Programmable Logic Control (PLC):** Specialized in Allen-Bradley ControlLogix, and MicroLogix systems.
- **Industrial Automation Design & Integration:** Skilled in integrating PLCs, HMIs, sensors, actuators, Cognex cameras, Sick LiDAR, and robotics.
- **Automated Guided Mobile Vehicles:** Experienced in navigation and manipulation with ClearPath, Robotino, and Quanser systems.
- **Collaborative Robots:** Proficient with Universal Robot systems.
- **Motion Capture Systems:** Skilled in Vicon motion capture technology.

3D Additive Manufacturing Equipment:

- **PolyJet Technology:** Experienced with Stratasys systems.
- **Metal Powder Bed Fusion Technology:** Specialized in Xact Metal technology.
- **Fused Deposition Modeling (FDM):** Proficient in Makerbot and FlashForge systems.
- **PCB Hybrid Technology:** Knowledgeable in BotFactory solutions.
- **Stereolithography (SLA):** Experienced with 3D Systems technology.

Characterization & Instrumentation Equipment:

- **Industrial X-ray/CT Scanning:** Expert in NIKON XTV160 systems.
- **X-ray Fluorescence:** Proficient with Hitachi technology.

- **Mechanical Testing Equipment:** Experienced with Shimadzu tensile, compression, fatigue testers, and Dage Series 4000 Bond Tester.
- **Electrical Systems Instrumentation:** Skilled in using oscilloscopes, signal generators, and NI-boards.
- **3D Dynamic Optical Profilometer:** Proficient in KLA Tencor MicroXAM – 100.
- **Gages:** Experienced with strain force, laser position, and 2D laser profilers.
- **Dynamic Thermal Imaging:** Skilled in FLIR technology.

General Cleanroom Equipment:

- **Photolithography Tools:** Experience with Mask Aligners, Spin Coaters, and Developers.
- **Etching Systems:** Experience with Wet Etching Stations, Dry Etchers, and Plasma Etchers.
- **Deposition Machinery:** Experience with CVD Systems and PVD Systems (sputtering).
- **Inspection & Metrology Instruments:** Experience with SEM, AFM, and Profilometers.
- **Cleaning & Surface Prep Tools:** Experienced with Ultrasonic Cleaners.
- **Dicing & Packaging Devices:** Experienced with Wafer Dicers (laser, saw, scraper), Wire Bonders, and Die Attach Equipment.
- **Environmental Control Systems:** Experienced with HEPA Filters and Temperature & Humidity Control.
- **Specialized Equipment:** Expert in laser micromachining (Excimer and Femtosecond) R&D, Furnaces, and Microscopes.
- **Customized systems:** 3D Micro assembly robotic stages.

Software Proficiencies:

- **FEM/CAD Modeling:** ANSYS Workbench, ANSYS APDL, SOLIDWORKS.
- **Programming:** MATLAB (Script, Simulink), LabView.
- **Embedded Systems:** Arduino.
- **Mechatronics Simulation:** Automation Studio, 20-Sim.
- **Robotics Software:** Fanuc Roboguide, Mitsubishi MELFA RTtoolbox, Studio 5000.

VI. Grants

Bowling Green State University (BGSU) Projects:

1. **Title:** *Next-Gen Engineering Excellence: Aligning Advanced Manufacturing Facilities with Future Skill Priorities in Ohio*.(RAPIDS 7.0)
   - **Awarded Amount:** $764,558.53
   - **Funding Source:** Ohio Department of Higher Education (ODHE), RAPIDS
   - **Period:** 12/1/2023 – 12/1/2025
   - **Team:** PI: Mohammad Mayyas, Co-PIs: MD Sarder, Mohammed Abouheaf, MD Za. Islam, Sri Kola, Sara Amar (Co-PI), Mikhail Shilov (Co-PI)
2. **Title:** *Advancing Regional Talent in Smart Tech-Enabled Manufacturing.*
   - **Funded by:** EDA Department of Commerce
   - **Award Amount:** $332,828
   - **Period:** 2024-2026
   - **Team:** PI: MD Sarder, Co-PIs: Mohammad Mayyas, Za Islam
3. **Title:** *Career Pathways in Smart Manufacturing and Logistics*.
   - **Requested Amount:** $637,2007
   - **Status:** Pending
   - **Funding Source:** NSF-ATE
   - **Period:** 06/1/2025– 05/1/2028
   - **Committed Person-Months Per Year (Summer):** 1.0
   - **Team:** PI: MD Sarder, Co-PIs: Mohammad Mayyas, Mohammed Abouheaf, MD Za. Islam.

4. **Title:** *Additive Metal Manufacturing for Advanced Training & Process Development* (RAPIDS 6)
    - **Funded by:** Ohio Department of Higher Education (ODHE), RAPIDS
    - **Award Amount:** $213,296
    - **Period:** 2023-2025
    - PI: Mohammad Mayyas, Co-PIs: Dr. Zahabul Islam, Dr. Mohammed Abouheaf
5. **Title:** *Advanced Additive Manufacturing: Destructive and Non-destructive Material Testing and Training* (RAPIDS 5)
    - **Funded by:** Ohio Department of Education (ODHE), RAPIDS
    - **Awarded Amount:** $157,745
    - Period: 2023-2025
    - PI: Mohammad Mayyas, Co-PIs: Dr. Zahabul Islam, Dr. Mohammed Abouheaf
6. **Title:** *Quality Design Process Training Based on the Implementation of Industrial Computed Tomography (CT) in Additive and Hybrid Manufacturing Technologies*
    - **Funded by:** Ohio Department of Higher Education (ODHE) RAPIDS, and internal match.
    - **Award Amount:** $202,000
    - **Period:** 2022-2024
    - **PI**: Mohammad Mayyas
7. **Title:** *Supply Chain Lead Time & Visibility Enhancement of GSW Manufacturing*
    - **Funded by:** GSW Manufacturing Inc.
    - **Awarded Amount:** $63,670
    - **Period:** Sept. 2022-Jan.2023
    - PI: MD Sarder, Co-PI: Mohammad Mayyas
8. **Title:** *RET Site: Workforce Rebuild through Advanced Manufacturing Training of K-14 Educators*
    - **Funded by:** NSF-RET
    - **Awarded Amount:** $600,000
    - **Period:** 9/1/22 – 8/31/2025
    - PI: MD Sarder, Co-PIs: Mohammad Mayyas, Mohammed Abouheaf, Za Islam
9. **Title:** *Ohio Robotics Advanced Training, Technical Assistance and Research Center*
    - **Funded by:** a gift-in-kind of FANUC America Corporation
    - **Awarded Amount:** worth over $320,000 FANUC CERT curriculum.
    - **Period:** 2020-2023
    - **PI:** Mohammad Mayyas
10. **Title:** *Ohio Robotics Advanced Training, Technical Assistance and Research Center*
    - **Funded by:** Ohio Capital Funds
    - **Awarded Amount:** $250,000
    - **Period:** 2020-2023
    - **Technical Lead:** Mohammad Mayyas
11. **Title:** *Automated Guided Vehicles for Smart-logistics and Safe Material Handling in Advanced Manufacturing and Warehouse Industries* (RAPIDS 4.0)
    - **Funded by:** Ohio Department of Higher Education (ODHE) RAPIDS
    - **Awarded Amount:** $147,345
    - **Period:** 2020-2022
    - **PI:** Mohammad Mayyas
12. **Title:** *Additive Manufacturing Training Based on the Implementation of Material Jetting Technology for the Production of Precision and Multi-layered Material Objects* (RAPIDS 3.0)
    - **Funded by**: Ohio Department of Higher Education (ODHE) RAPIDS
    - **Awarded Amount:** $145,209

- **Period:** 2018-2021
- PI: Mohammad Mayyas

13. **Title:** *Vision System Training Center*
    - **Funded by:** a gift-in-kind of Cognex Corporation
    - **Awarded Amount**: $70k of vision systems (10 units)
    - **Period:** 2018
    - **PI:** Mohammad Mayyas
14. **Title:** *E-Factory: Cyber Manufacturing Workforce Development* (RAPIDS 2.0)
    - **Funded by**: Ohio Department of Higher Education (ODHE) RAPIDS
    - **Awarded Amount:** $394
    - **Period:** 2017-2020
    - **PI:** Mohammad Mayyas
15. **Title:** *Advance Manufacturing Training Equipment: Mechatronics and Process Control Mobile Units* (RAPIDS 1.0)
    - **Funded by**: Ohio Department of Higher Education (ODHE) RAPIDS
    - **Awarded Amount:** $1000,000
    - **Period:** 2016-2019
    - **Muti-institutional PI's:** (Leading institution North West State Community College , PI: Todd Hernandez), and (BGSU, PI: Mohammad Mayyas).
16. **Title:** *Development of Robotics Facility*
    - **Funded by:** a gift-in-kind of Rixan Associate Inc
    - **Awarded Amount:** worth over $1000,000 (10 basic Robot Cells).
    - **Period:** 2015
    - **Multiple:** Contact and technical lead: Mohammad Mayyas. Administration (Sara Zulch Smith- Capital Campaign, Rodney Roger – Academic provost, Venu Dasigi – Interim Dean of CAATE).
17. **Title:** *Falcon BEST Robotics*
    - **Funded by:** a gift-in-kind of First Solar
    - **Awarded Amount:** $15,000
    - **Period:** 2016-2018
    - **Event Lead:** Mohammad Mayyas. Capital Campaign: Sara Zulch Smith.
18. **Title:** *Falcon BEST Robotics*
    - **Funded by:** a gift-in-kind of Lothrop
    - **Awarded Amount:** $15,000
    - **Period:** 2016-2018
    - **Event Lead:** Mohammad Mayyas. Capital Campaign: Sara Zulch Smith.
19. **Title:** *Falcon BEST Robotics*
    - **Funded by:** BGSU foundation.
    - **Awarded Amount:** $2,000
    - **Period:** 2016
    - **Event Lead:** Mohammad Mayyas.
20. **Title:** *Establishment of Multi-scale Robotics Laboratory*
    - **Funded by**: Start-up fund from office of research and College of Technology, Architecture and Applied Engineering
    - **Awarded Amount:** $20,000
    - **Period:** 2014
    - **PI:** Mohammad Mayyas

21. **Title:** *Project Kaleidoscope (PKAL) Conference, AAC&U's STEM higher education reform center*
    - **Funded by**: NSF-SEA
    - **Awarded Amount:** $3500
    - **Period:** 2017
    - **PI:** Mohammad Mayyas
22. **Title:** *Finite Element Modeling Software, ANSYS – 50 educational seats*
    - **Funded by**: Internal funding from BGSU Information Technology
    - **Awarded Amount:** $2400 Per Year
    - **Period:** 2014- 2019
    - **PI:** Mohammad Mayyas
23. **Title:** *Mechatronics Software, 20-sim – unlimited seats*
    - **Funded by**: Internal funding from BGSU Information Technology/ and College of Technology, Architecture and Applied Engineering
    - **Awarded Amount:** $6000, and $896 annual maintenance.
    - **Period:** 2016-2022
    - **PI:** Mohammad Mayyas
24. **Title:** *Characterization of 3D grasping mechanism*
    - **Funded by**: BGSU-CURS program.
    - **Awarded Amount:** $500 material + $200 Stipend.
    - **Period:** 2016
    - **Supervisor:** Mohammad Mayyas
25. **Title:** *Characterization of smart skin sensor*
    - **Funded by**: BGSU-CURS program.
    - **Awarded Amount:** $500 material + $200 Stipend.
    - **Period:** 2016
    - **Supervisor:** Mohammad Mayyas
26. **Title:** *Modeling and Simulation of capacitive sensor*
    - **Funded by**: BGSU-CURS program.
    - **Awarded Amount:** $500 material + $200 Stipend.
    - **Period:** 2016
    - **Supervisor:** Mohammad Mayyas
27. **Title:** *Development of weather station- students independent study*
    - **Funded by**: College of Technology, Architecture and Applied Engineering
    - **Awarded Amount:** $1000 material.
    - **Period:** 2016
    - **Supervisor:** Mohammad Mayyas
28. **Title:** *Outreach research program for development of Robotics Alliance*
    - **Funded by**: faculty development grant-BGSU
    - **Awarded Amount:** $2000 (Speaker series)
    - **Period:** 2014
    - **PI:** Mohammad Mayyas
29. **Title:** *Robotics Facility Renovation- Lab 123 - for the Mechatronics Engineering Technology Program*
    - **Funded by**: Office of the Provost
    - **Awarded Amount:** $160,000
    - **Period:** 2014
    - **Lab Director:** Mohammad Mayyas

University of Texas at Arlington (UT-Arlington) Grants:

30. **Title:** *Biomechanical Interface for Optimized Delivery of MEMS Orchestrated Mammalian Epimorphosis*
    - **Funded by**: Armed Forces Institute of Regenerative Medicine, US Army
    - **Total Awarded Amount:** $2000,000, Subaward: $80,000 Per year.
    - **Period:** 2013-2016
    - **Multi-institutional: (**University of Texas at Arlington sub awardee PI: Mohammad Mayyas), **(**McGowan Institute for Regenerative Medicine at the University of Pittsburg grant PI: Stephan Badylak).
31. **Title:** *BIODOME reactor*
    - **Funded by**: McGowan Institute for Regenerative Medicine at the University of Pittsburg
    - **Total Awarded Amount:** $12,000
    - **Period:** June-August 2013
    - **PI:** Mohammad Mayyas

32. **Title:** *Tower of Hanol: A Sensorized Gaming Platform to Assess Cognitive Functions*
    - **Funded by**: College of Nursing, University of Texas at Arlington
    - **Total Awarded Amount:** $10,000
    - **Period:** August-Dec. 2013
    - **Co-PI:** Mohammad Mayyas, PI. Aditya Das.
33. **Title:** *3D Point-of-Gaze Based Wheelchair Control*
    - **Funded by**: University of Pittsburg
    - **Total Awarded Amount:** $72,000
    - **Period:** 2012-2013
    - **PI:** Mohammad Mayyas.
34. **Title:** *Manufacturing Innovation for Technology Transition*
    - **Funded by**: Office of Naval Research
    - **Awarded Amount:** $1,533,649
    - **Period:** 2011-2016
    - **Co-PI:** Mohammad Mayyas, PIs (Harry Stephanou -2011 Deceased-, Aditya Das 2012-2016)
35. **Title:** *High-density Interconnect for high-resolution APD/ROIC Hybridization*
    - **Funded by**: SBIR Phase I, Department of Defense, Air Force
    - **Total Awarded Amount:** $250,000, Sub awarded: $70,000
    - **Period:** 2008-2009
    - **Sub awardee PI:** Mohammad Mayyas, PIs (Princeton Lightwave PI- Sabbir Rangwala)
36. **Title:** *Disruptive techniques for hybridization of focal plane arrays for optical imaging sensors*
    - **Funded by**: SBIR Phase II, Department of Defense, Air Force
    - **Total Awarded Amount:** $749,681
    - **Period:** 2010-2012
    - **Sub awardee PI:** Mohammad Mayyas, PIs (Princeton Lightwave PI- Sabbir Rangwala)
37. **Title:** *Development of Microsystem Platforms in Hazardous environments Applications to Munitions and Enhancement*
    - **Funded by**: Office of Naval Research
    - **Total Awarded Amount:** $6,530,046
    - **Period:** 2008-2012

- **Co-PI:** Mohammad Mayyas, PI: Harry Stephanou.

38. **Title:** *Microactuator Array for CMP Pressure Control*
    - **Funded by**: Strasbaugh
    - **Total Awarded Amount:** $120,000
    - **Period:** 2011-2012
    - **PI:** Mohammad Mayyas, Co-PIs: John Sin, Wohoo(Jeff) Lee.

39. **Title:** *Texas Youth in Technology Program*
    - **Funded by**: Nanomaterials Design & Commercialization Center
    - **Awarded Amount:** $70,000
    - **Period:** 2009-2010
    - **PI:** Mohammad Mayyas

Grants Prepared for Resubmission (BGSU)

40. **Title:** *FASTER: Future Approaches for Semiconductor Training and Education w/ RAPIDs*
    - **Total Estimated Amount:** $2,586,238, BGSU Subaward: $709,853 (Tentative based on previous submission)
    - **Status:** Revise and resubmit full proposal
    - **Targeted Source:** Intel Corporation.
    - **Planned Resubmission:** 2025
    - **Multi-institutional Team:** (BGSU PI: Mohammad Mayyas, BGSU CO-PIs Mohammed Abouheaf, MD Za Islam), (University of Toledo PI: Raghav Khanna,), (Ohio Northern University), (Northwest State Community College), (Lorian County Community College), (Rhodes State College)

41. **Title:** *Renewable Energy Sources Integration into Hybrid Microgrids Using Machine Learning*
    - **Estimate Amount:** $256,000 (Tentative based on previous submission)
    - **Status:** Revise and resubmit full proposal
    - **Targeted Source:** USAID
    - **Planned Resubmission:** 2024
    - **Team:** USA (PI: Mohammad Mayyas, PI: Mohammed Abouheaf), Egypt (TBD)
42. **Title:** *Smart Joints: Amorphous Legged Robots for Seamless Motion in Extraterrestrial Locations*
    - **Estimate Amount:** $412,011 (Tentative based on previous submission)
    - **Status:** Revise and resubmit Whitepaper
    - **Targeted Source:** National Defense Industrial Association, NASA or Micro Autonomous Systems and Technology, Us. Army.
    - **Planned Resubmission:** 2024
    - **Team:** (BGSU PI: Mohammad Mayyas, Johns Hopkins APL PI: Rochelle Mellish)
43. **Title:** *Sensing ethanol levels during animal behavior*
    - **Estimate Amount:** $24,000 (Tentative based on previous submission)
    - **Status:** Revise and resubmit full proposal
    - **Targeted Source:** The American Association for Laboratory Animal Science (AALAS)
    - **Planned Resubmission:** 2024
    - **Team:** PI: Howard Casey Cromwell, Co-PI: Mohammad Mayyas.

VII. Selected Research and Development Projects

1. Successfully engineered a pioneering surveillance system utilizing autonomous micro-robots, revolutionizing monitoring in high-risk areas with advanced micro-robotics for sensor mobility enhancement. 2008-2011
2. Achieved a breakthrough in tissue regeneration by creating a novel biomechanical device, expertly designing biomechanical interfaces for restoring tissues in animal study. 2009-2013
3. Innovated in personal grooming technology by developing a long-lasting, high-precision shaving device, utilizing cutting-edge Excimer laser and Nanomachining for the ultra-fine sharpening of Sapphire blades, integrated with bespoke automation for precision. 2011-2012
4. Transformed silicon wafer polishing processes by upgrading Chemical Mechanical Polishing machines with MEMS-based technology, achieving mirror-like finishes through innovative distributed force control via piezoelectric actuators. 2009-2010
5. Mastered MEMS component assembly and packaging, designing sophisticated electro-thermo-mechanical actuators for precise micro-object handling, leveraging SOI fabrication technology and robotic arm synchronization. 2004-2008
6. Devised an efficient technique for detaching MEMS devices from large wafers, employing unique frequency-based shaking methods. 2009-2013
7. Developed a compact Fourier transform spectrometer, a significant advancement for immediate, onsite detection of biological and chemical materials, integrating a novel 3D optical system on a silicon micro-optical bench. 2007-2009
8. Led the development of microsystems manufacturing with an automated single-chip assembly process, providing a groundbreaking alternative to traditional multi-chip or monolithic fabrication methods. 2006-2009
9. Developed a Modified Stewart Platform Manipulator for precise orthopedic bone and structural frame alignment correction. 2009-2010, 2016
10. Successfully implemented precision kinematic coupling for wafer alignment, facilitating high-density interconnects and enhancing high-resolution APD/ROIC hybridization in night vision application. 2009-2011
11. Contributed to the establishment of the Texas MicroFactory in University of Texas Research Institute, assisting in setting up modular research and development cleanroom facilities and acquiring advanced MEMS microfabrication and testing equipment. 2004-2009
12. Assisted in development of an AI-driven Pedestrian and Driver Risk Prevention System, focusing on monitoring and predicting behaviors to categorize risks, effectively enhancing road safety and reducing accidents. 2020-2021
13. Established multimillion e-factory industry training and research and development facilities in Bowling Green State University, focusing on advanced additive manufacturing, advanced industrial and mobile robotics, control, Mechatronics, automation, and instrumentation. 2015-present
14. Integrated automated industrial cells using Mitsubishi SCARA robots, Fanuc Robot, Allen Bradley PLC, View Panel HMI, and Cognex Vision systems, showcasing efficiency in pick-and-place sorting. 2015-2020.
15. Developed algorithms using multimodal sensors (2D Vision, Lidar, Sonar) for Automated Guided Vehicles (AGVs), ensuring dependable navigation in complex environments 2021 -2023.
16. Led the construction of industrial protocol Ethernet-based I/O network for precision hard automation in material handling, successfully integrating conveyor belts, motor drivers, pneumatic solenoids, grippers, linear actuators, PLCs, HMIs, and laser curtains for enhanced efficiency and control. 2022.

17. Led the Implementation of an integrated automation system combining a Fanuc Robot, Allen Bradley PLC, View Panel HMI, and AI-powered Cognex Vision systems, demonstrating efficient classification, inspection and sorting of defective products including paper wrinkles and weld. 2023.

VIII. Publication

Patents

1. **M. Mayyas**, Shiakolas, P. "Method and Apparatus for Detethering Mesoscale, Microscale, and Nanoscale Components and Devices" U.S. Patent Appl.(Issued 2014)

Industry Report

2. **M. Mayyas**, "The Benefits of the Automated Guided Vehicles in the Smart Manufacturing Industry of Tomorrow", MHI Annual report for AGVS, Dec. 2018. Available at https://www.mhi.org/free/26588

Submitted

Mohammad Mayyas, Naveen Kumar, MD. Za Islam, and Mohammed Abouheaf "Multi-scale Grasping: A Kinematic Study of 5-Linkage Compliant Mechanisms" submitted to Part C: Journal of Mechanical Engineering Science

Under Preparation

M. Mayyas, "Destructive Oscillation for Selective and Parallel Release of Tethered Objects" to be submitted as a *letter communication to the journal of sound and vibration.*

M.Mayyas "REPLT TO REFERENCE **[**TRANSVERSE VIBRATIONS OF A LINEARLY TAPERED CANTILEVER BEAM WITH TIP MASS OF ROTATORY INERTIA AND ECCENTRICITY]" to be submitted as a *letter communication to the journal of sound and vibration.*

Peer-Reviewed Journal Publications

3. Islam, Z., Ahmed, T., **Mayyas, M**., & Abouheaf, M. (2024). Tensile and Compressive Response of Tungsten g-TPMS Lattice Structures. *Materials Today Communications*, 109606.
4. Abouheaf, M. I., Hashim, H. A., **Mayyas**, M. A., & Vamvoudakis, K. G. (2023). An Online Model-Following Projection Mechanism Using Reinforcement Learning. *IEEE Transactions on Automatic Control*.
5. **Mayyas, Mohammad**, and Mohammed Abouheaf. "Energy harvesting induced by the vibration of reciprocating-piston compressor subjected to repetitive impulse." *Journal of Vibration and Control* (2023): 10775463231201888.
6. Parvin, S., & Mayyas, M. (2023). Wind energy market in USA. *European Journal of Sustainable Development Research*, *7*(1).
7. **Mayyas, Mohammad**. "Design characterization of 3D printed compliant gripper." *Meccanica* 57.3 (2022): 723-738.
8. Indravash Chowdhury, Ravinder Singh, Christopher Kluse, and **Mohammad Mayyas**, "Obstacle Design Approach for Safety of Free Ranging AGVs in Shared Working Environment". *Advances in Science, Technology and Engineering Systems Journal*, Volume 6, Issue 5, Page No 335-347, 2021.
9. **Mayyas, Mohammad.** "Modeling and analysis of vibratory feeder system based on robust stick–slip motion." *Journal of Vibration and Control* (2021): 10775463211009633.

10. **Mayyas, Mohammad.** "Interpolation of tensile properties of polymer composite based on Polyjet 3D printing." *Progress in Additive Manufacturing* (2021): 1-9.
11. **Mayyas, Mohammad.** "Parallel Manipulation Based on Stick-Slip Motion of Vibrating Platform." *Robotics* 9.4 (2020): 86.
12. **M.Mayyas,** Naveen Kumar, "DESIGN AND SYNTHESIS OF COMPLIANT MECHANISM FOR 3D MICRO-GRASPING**"** *International Journal of Robotics and Automation,* (2020) 206-0614
13. **Mayyas, Mohammad**, and Ikya Mamidala. "Prosthetic finger based on fully compliant mechanism for multi-scale grasping." *Microsystem Technologies* 27.5 (2021): 2131-2145.
14. **Mayyas, Mohammad,** Sai P. Vadlamudi, and Muhammed A. Syed. "Fenceless obstacle avoidance method for efficient and safe human–robot collaboration in a shared work space." *International Journal of Advanced Robotic Systems* 17, no. 5 (2020): 1729881420959018.
15. **M. Mayyas,** "Three-Point Inverse and Forward Kinematic Algorithms for Circle Measurement from Distributed Displacement Sensor Network." *Sensors* 19, no. 21 (2019): 4679. **M. Mayyas**, "Image Reconstruction and Evaluation: Applications on Micro-Surfaces and Lenna Image Representation," *J. Imaging*, *2*, 27 (2016)
16. **M. Mayyas**, R. Mellish "A method for the automatic generation of inverse kinematic maps in modular robotic systems," International Journal of Advanced Robotic Systems 1–15 (2016)
17. **M. Mayyas**, "Piezoelectric MEMS array package for distributed CMP pressure control Smart Materials and Structures 24(6), 065006 **(**2015).
18. **M. Mayyas**, "Bioinspired legged-robot based on large deformation of flexible skeleton Bioinspiration & biomimetics 9(4), 046013 (2014).
19. **Mayyas,** M. Comprehensive Thermal Modeling of ElectroThermoElastic Microstructures. *Actuators*, *1*,pp. 21-35 **(2012)**
20. **Mayyas, M**., Zhang, P., Lee, W-H., Popa, D., Chiao, JC. "An active micro joining mechanism for 3-D assembly." J. Micromech. Microeng., Volume 19 ,(2009)
21. **Mayyas, M.,** Sin, J., Stephanou, H. "Methodologies for the Assembly of a Fiber Coupled MEMS Fourier Transform Spectrometer." IEEE Transactions on Components and Packaging Technologies. Vol. 32,issue 1, **2009,** pp**.** 658-666.
22. **Mayyas, M**., Stephanou, H. "Electrothermoelastic modeling of MEMS gripper." Microsystem Technologies, 2009, Volume 15, Number 4, pp. 637-646. (2009)
23. **Mayyas, M.,** Shiakolas, P., Lee, W-H., Stephanou, H. "Thermal cycle modeling of electrothermal microactuators." Sensors and Actuators A: Physical, Volume 152, Issue 2, pp.192-202 (2009)
24. **Mayyas, M.,** Shiakolas, P. "Micro-surfaces reverse engineering and compensation for laser micromachining." IEEE Transactions on Automation Science and Engineering. Volume 6, issue 2, pp. 291-301 (2009)

Peer-Reviewed Conference Publications (Proceedings)

22 Muteb Aljasem, **M. Mayyas**, Kevin Duke, Mikhail Shilov, Zahabul Islam, Mohammad Abouheaf and Wail Gueaieb, "Swish-ResNet Framework for Faulty Weld Detection " 2024 IEEE International Symposium on Robotic and Sensors Environments (ROSE).

23 Mohammad Abouheaf, Wail Gueaieb, **M. Mayyas** and Muteb Aljasem, "A Model-Free Leader-Follower Approach with Multi-Level Reference Command Generators, " 2024 IEEE International Symposium on Robotic and Sensors Environments (ROSE).

24 Mohammad Abouheaf, Wail Gueaieb , **M. Mayyas ,** "Behavior Replication of Cascaded Dynamic Systems Using Machine Learning", 2023 IEEE International Symposium on Robotic and Sensors Environments, Japan.

25 Abouheaf, M. I., Vamvoudakis, K. G., **Mayyas, M**. A., & Hashim, H. A. (2023, December). An Observer-Based Reinforcement Learning Solution for Model-Following Problems. In *2023 62nd IEEE Conference on Decision and Control (CDC)* (pp. 7976-7981). IEEE.

26 MD Sarder, **M. Mayyas**, Reshoring and Its Economic Impact Analysis Using Location Quotient, 2018 IISE Annual Conference, May 19-22, Orlando Florida, United State.

27 R. Mellish and **M. Mayyas**, A Sensor-Based Control Strategy for the Correction of Growth Abnormalities In, 2015 IEEE International Conference on Multisensor Fusion and Information Integration. (IEEE, San Diego, CA, USA, 2015).

28 **Mayyas, M**. Lee. W.H., Stephanou H. Microrobotic surveillance: discrete and continuous STARbots," *SPIE Defense, Security, and Sensing* , 25-29 April 2011 in Orlando, Florida, United States.

29 Sin J., Lee W.H., Mittal M., **Mayyas. M**, and Harry Stephanou, Manufacturability Analysis of Assembled FT Microspectrometer," *International Conference on Optical MEMS & Nanophotonics* (Clearwater Florida, 2009)

30 **Mayyas, M.** Zhang, P., Lee, W- H., Shiakolas, P., Popa, D., 2007. Design Tradeoffs for Electrothermal Microgrippers, *ICRA07* (Roma, Italy, April 2007)

31 **Mayyas, M.,** Shiakolas, P. A Study on The Thermal Behavior Of Electrothermal Microactuators Due To Various Voltage Inputs. *Proceedings of IMECE 2006*, Paper No. IMECE2006-15321 (Chicago IL, November 2006)

32 **Mayyas, M.,** Shiakolas, P. Micro-Surface Construction and Characterization from Digital Elevation Model Using Thin Plate Splines in Matlab Environment. *Proceedings of IMECE 2006*, Paper No. IMECE2006-13471, (Chicago IL, November 2006)

33 Zhang, P., **Mayyas, M**., Lee,W. H., Popa,D., Shiakolas,, P., Stephanou, H., Chiao, JC., 2006. An Active Locking Mechanism for Assembling 3D Micro Structures. *SPIE International Smart Materials*, *Nano- & Micro-Smart Systems Symposium* (Adelaide Australia, Dec.10-13 2006).

34 **Mayyas, M**., Shiakolas, P. , Lee, W. H., Popa, D., Stephanou,H.; 2006. Static and dynamic modeling of thermal microgripper. *MED06-14th Mediterranean Conference in Automation and Control* (Ancona, Italy, June 2006)

35 **Mayyas, M.,** Shiakolas, P. Application of Thin Plate Splines for Surface Reverse Engineering and Compensation for Femtosecond Laser Micromachining. *Proceedings of the IEEE International (Cyprus, 2005)*

36 Zhang, P., **Mayyas, M.**, Lee W. H., Popa, D., Shiakolas P., Stephanou, H., Chiao, JC., 2006. Design of an Active Lock for Integrating 3D Micro Structures. *TEXMEMS VIII International Conference on MEMS* (Dallas, Texas, Sept-2006)

37 **Mayyas, M**., Zhang, P., Shiakolas, P., Lee W. H., Popa, D., Stephanou,H., 2006. Issues in the Current and Thermal Distribution for a Probed Electrothermal MEMS Actuator of Parallel Resistive Structure. *TEXMEMS VIII International Conference on MEMS* (Dallas, Texas, Sept-2006)

38 **Mayyas, M.,** Lee, W. H., Popa, D., Shiakolas, P., Zhang, P., Stephanou, H., 2005. Comprehensive Electrothermal Modeling of a Thermal Microgripper. *TEXMEMS VII International Conference on MEMS* (El Paso, TX, September 2005)

39 Hsu, L.,George,V.,Popa, D., Lee, W. H., **Mayyas, M**., Zhang, P., Stephanou, H., Chiao, JC., 2005. 3D Microassembly Station. *in Proceedings of TexMEMS VII* (El Paso, Texas, September 2005)

40 **Mayyas, M**., Shiakolas, P. Transient Thermal Model of an Attached Lateral Thermal Actuator. TEXMEMS VII International Conference on MEMS, (El Paso, TX, September **2005**)

41 **Mayyas, M.,** Yih, TC., 2003. Analytical Modeling of Circular Micropump Membrane Actuated by an Electromagnetic Actuator. *TexMEMS V Conference and Workshop* (Fort Worth, TX, May 2003)

STEM Education and Engineering Posters/Conferences:

42 MD. Sarder, **M.Mayyas**, M. Abouheaf, "Enabling K-14 Educators in Developing and Deploying Advanced Manufacturing Curricula" American Society for Engineering Education, Annual Conference and Exposition, 2024

43 [PS] Dapelo, L., Austin, J., Justice, T., Sarder**, M., Mayyas**, M., Abouheaf, M., and Islam, Z., (2023), STEM Curriculum Development of Renewable Energy, Robot Construction, and Medical

Application of Additive Manufacturing, 2023 NSF Research Experience for Teachers (RET), Virtual Poster Session.

44 [PS] Doolittle, C., Kulwicki, Z., Williams, S., Abouheaf, M., Islam, Z., **Mayyas, M**., and Sarder, M., (2023), Enhancing Problem-Solving Skills Through Integration of Fanuc Robot Arm, Machine Vision, Mechatronics, Electrical Circuit, and 3D Printing Design: A 5E Model Approach, 2023 NSF Research Experience for Teachers (RET), Virtual Poster Session.

45 [PS] Howey, D., Martin, C., Smelcer, K., Islam, Z., Sarder, M., Abouheaf, M. and **Mayyas, M.** (2023), Development of STEM Curriculum through Experiential Learning Case Studies- RoboDK industrial robotics Software, Automation Studio Motor Simulation and 3D printing of Composite Material, 2023 NSF Research Experience for Teachers (RET), Virtual Poster Session.

46 [PS] Aljabr, B., Faisant, J., Foos, B., Islam, Z., Sarder, M., Abouheaf, M. and **Mayyas, M**. (2023), Expanding STEM Opportunities for K-14 Students Through Teacher Research Experience, 2023 NSF Research Experience for Teachers (RET), Virtual Poster Session.

47 [PS] Farley, P., Fisher, C., Jarusiewic, S., Islam, Z., Sarder, M., Abouheaf, M. and **Mayyas, M**. (2023), Exploring Integrated Industrial Automation: Hands On Learning with PanelView HMI, ControlLogix PLC, and Fanuc Robot ER 4iA, Pick n Place Case Study, 2023 NSF Research Experience for Teachers (RET), Virtual Poster Session.

48 [PS] Alabkary, B., Sarder**, M., Mayyas**, M., Abouheaf, M., Islam, Z., Simulating Smart Home Integration with Arduino Kits in Technical Schools, 2024 NSF Research Experience for Teachers (RET), Virtual Poster Session.

49 [PS] Doolittle, C., Sarder, **M., Mayyas**, M., Abouheaf, M., Islam, Z., Arduino and Systems Integration Towards Advanced Manufacturing, 2024 NSF Research Experience for Teachers (RET), Virtual Poster Session.

50 [PS] Dowling, D., Sarder, **M., Mayyas**, M., Abouheaf, M., Islam, Z., Promoting STEM Career Pathways: The Potential Role of Alvik Educational Robots in K-12 Settings, 2024 NSF Research Experience for Teachers (RET), Virtual Poster Session.

51 [PS] Good, B., Sarder, **M., Mayyas**, M., Abouheaf, M., Islam, Z., Structuring a Project-Based Learning Unit in Robotics and Advanced Manufacturing Using Arduino UNO to Build a Color Sensing Controlled Conveyor System, 2024 NSF Research Experience for Teachers (RET), Virtual Poster Session.

52 [PS] Hale, K., Sarder**, M., Mayyas**, M., Abouheaf, M., Islam, Z., The Merit of Sensors in Advanced Manufacturing to Teach Input and Output to Secondary Students, 2024 NSF Research Experience for Teachers (RET), Virtual Poster Session.

53 [PS] Henderson, O., Sarder, **M., Mayyas**, M., Abouheaf, M., Islam, Z., Constructing Autonomous Vehicles in Mathematics Class to Promote Students Interest in Robotics, 2024 NSF Research Experience for Teachers (RET), Virtual Poster Session.

54 [PS] Kozak, A., Sarder, **M., Mayyas**, M., Abouheaf, M., Islam, Z., Utilizing the Engineering Design Process and 21st Century Skills to Enhance Student Learning Using Sensor-Based Robotics, 2024 NSF Research Experience for Teachers (RET), Virtual Poster Session.

55 [PS] Kwiatkowski, M., Sarder**, M., Mayyas**, M., Abouheaf, M., Islam, Z., Guidance Control of Autonomous Vehicles Using an Arduino and Sensor Suite, 2024 NSF Research Experience for Teachers (RET), Virtual Poster Session.

56 [PS] Lutheran, A., Sarder, **M., Mayyas**, M., Abouheaf, M., Islam, Z., Enhancing High School Physics with Arduino: Projectile Motion, 2024 NSF Research Experience for Teachers (RET), Virtual Poster Session.

57 [PS] Makonnen, R., Sarder, **M., Mayyas**, M., Abouheaf, M., Islam, Z., Utilizing First Person View Robotic Arm for Teaching Science Concepts: An Analysis of the ArmPi FPV Robotic Arm Advance Kit, 2024 NSF Research Experience for Teachers (RET), Virtual Poster Session.

58 [PS] Sharaba, P., Sarder, **M., Mayyas**, M., Abouheaf, M., Islam, Z., Introducing Robotic Arms into STEM Education, 2024 NSF Research Experience for Teachers (RET), Virtual Poster Session.

59 [PS] Straus, A., Sarder, **M., Mayyas**, M., Abouheaf, M., Islam, Z., Enhancing the Precision and Reliability of a Budget-Servo Robotic Arm with a Vision System for Educational and Industrial Applications, 2024 NSF Research Experience for Teachers (RET), Virtual Poster Session.

60 [PS] Zimmerman, D., Sarder, M., **Mayyas, M**., Abouheaf, M., Islam, Z., Teaching Levels of Automation using Arduino in Soil Water Management, 2024 NSF Research Experience for Teachers (RET), Virtual Poster Session.

IX. Selected Presentations

22 Advancing Interoperability and Integration of Ground and Water Robotics: is there a role for small scale robotics in defense application? Military robotic summit, Institute for Defense and Government Advancement, August 27 - 29, 2012 - Hilton Alexandria Old Town, Alexandria, Virginia.

23 Micro-robotics Application for Security: Unmanned Ground Systems Technology: The Role of Micro-Robotics in Border Management, 2nd Annual Border Management Summit Southwest, Institute for Defense and Government Advancement, El Paso, TX, May 23-25 2011. (Invited session leader)

24 Constructing Microrobots, Arlington Technology Association, College of Engineering, UT-Arlington, June 1st **2011**. (Invited speaker)

25 Proposal for National Center for Integrated Microsystems Technologies, and a National Center for the Security and Assurance of Information and Communication Systems, Video conference with King Abdulla II of Jordan, & President of Hashemite University, Feb. 11th 2011.

X. Selected Media Spotlights on Research and Engagement

1. BGSU Visits by Ohio Officials

- "Ohio Gov. Mike DeWine Tours Nursing, Robotics Facilities at BGSU." Toledo Blades, BG Independent, October 2021.
- "Ohio Lt. Gov. Husted Tours BGSU's Robotics and Engineering Labs." The Morning Show BG, Sentinel Tribune, WTOL11, August 2022.

2. Arts and Robotics

- "Interactive Art at Toledo Museum of ART Summer Camps." Toledo Blades, NBC, 2017.

3. BGSU Promotions and FalconBEST

- "FalconBEST 2016: 25-Minute Program Interview." WBGTV, 2016.
- "FalconBEST 2016: Coverage on Multiple Local Newspaper Interviews and TV." The Blade, WBGTV, NBC, 2016.
- "BGSU Promotional Video for Engineering Technologies." Featuring interviews and students working in the lab, 2016.
- "BGSU TV Advertisement." Scene taken in the lab with a student constructing ground robots, 2014.

4. Robotics Research and Advancements

- "Robotics Revolution." UT Arlington Magazine, Spring 2011. Featured on the cover page.
- "Tiny Machines for Surveillance & Intelligence-Gathering." Interview by Randi Kaye from CNN International with ARRI director regarding microrobotics for defense, August 19, 2011.

- "Microrobots: The 2nd Generation Industrial Revolution." Discussion on CBNC by Cramer with ARRI director about a microbot with significant capabilities, May 26, 2011.

XI. Graduate Student Projects

Supervisor

- R. Jahan – "3D Printed Flexible Material Properties" (2020, MTM/BGSU)
- J. Dixit Goalla – "Vibration Platform for Material Transport" (2020, MTM/BGSU)
- S. Vadlamudi – "Object Trajectory Prediction for Safety" (2020, MTM/BGSU)
- I. Chowdhury – "Human-Robot Safety & Collision Probability" (2020, MTM/BGSU)
- A. Ayoko – "Modified Steward Platform Design" (2016, BGSU)
- I. Mamidala – "Scalable 3D Grasping Mechanism" (2016, BGSU)
- R. Mellish – "Growth Abnormality Correction" (2011, UT-Arlington)
- K. Doelling – "CNC Laser & Robotic Arm Integration" (2012, UT-Arlington)
- D. Hua – "Micro Robotics Wireless Network" (2009, UT-Arlington)
- A. Bedoin – "Solder Reflow Simulation on Silicon" (2009, UT-Arlington)
- R. Rose – "MEMS Chips Vibration Platform" (2008, UT-Arlington)
- K. Sharad – "Precision Catheter Needle Design" (2008, UT-Arlington)

Committee Member

- T. Ackon, Supervisor: C. Kluse – "Sustainability vs Competitiveness" (2019, MTM/BGSU)
- A. Mehmood, Supervisor: C. Kluse – "Sustainability Reports & LDA Topic Modelling" (2018, MTM/BGSU)
- A. Alwarsh, Supervisor: C. Kluse – "Lean Six Sigma & Leadership" (2017, MTM/BGSU)
- J. Espinoza, Supervisor: C. Kluse – "Course on Lean Development" (2016, MTM/BGSU)
- Z. Brush, Supervisor: A. Bowling – "Smart Bed for Ulcer Prevention" (2012, MSME/UTA)

XII. Association & Professional Activities

Professional Memberships & Affiliations:

- AAC&U, since 2017
- SPIE (Optics, Photonics, & Imaging), since 2011
- IEEE, 2003-2009 & renewed 2015
- ASME, 2005-2013
- Jordan Engineers Association, since 2001

Editorial & Committee Roles:

- Associate Editor, Robotics & Automation Engineering Journal, since 2017
- Editorial Board, Journal of Robotics & Mechanical Engineering Research, since 2016
- Int'l Scientific Committee, ICEWES 2015
- Head, Int'l Scientific Committee, Hashemite University, Jordan

Reviewer For:

- IEEE Robotics & Automation, JM3, ASME-IMEC, IEEE T-ASE, IEEE Automatic Control, Int'l Journal of Engineering Science, Sensor & Actuators- Physics, SPIE-imaging, Actuators, Microsystems Technologies

Other Activities:

- Coordinates national and international student tour days focusing on automation and robotics at MODEX (Atlanta) and ProMat (Chicago) annual trade shows, under the auspices of the College Martial Handling Institute (MHI)'s Industry Council on Material Handling Education (CICMHE), 2021-present.

- Attended the Material Handling Institute's teacher workshop in San Marcos, TX, 2019.
- Achieved certification in Fanuc Robotics instructor training, focusing on programming and vision systems, Fanuc North America, MI. 2019.
- Provided consultancy services for the Material Handling Institute's Automated Guided Vehicle industry group, 2018.
- Completed instructor training and certification for Mitsubishi robots, Rixan Associate, Oh. 2016.
- Earned ANSYS APDL and Workbench Certification from Phoenix Analysis & Design Technologies in Arizona, 2010.
- Participated in NSF & NIH Grant writing training at the University of Cleveland, 2014.
- Engaged in academic and industry collaborations through facility tours, including visits to the Massachusetts Institute of Technology in Boston and Disaster City in Texas.
- Facilitated the establishment of an MOU between UT-Arlington AURAK-UAE in 2015.
- Contributed to the formation and ongoing maintenance of the NORTH consortium, encompassing institutions in Northwest Ohio, from 2015 to present.
- Engaged in dialogues with nearby community colleges (Terra, Defiance, Northwest State) to initiate program articulation, ongoing since 2016.
- Actively participated in various industry-academia discussions for workforce development with companies including Rixan Associate Inc., Magna Nonplus, VeTek, First Solar, GKN Driveline, Sauder, Cognex, ongoing since 2016.
- Designed and executed an Interactive Electronics and Art summer camp at the Toledo Museum of Art for underrepresented students, 2017-2018.
- Organized seminars for the Tech Trek summer camp to support women in engineering, 2016.
- Served as a judge for STEM competitions, including FalconBest Robotics (2013-2014) and Science Olympiad (2016).

XIII. General Administrative and Service Duties

Committee Leadership & Membership:

- Spearheaded various search committees such as (VP of research, 2022; Engineering Dean, 2023; Department Chair 2016; Engineering faculties 2020-present)
- Actively participated in merit dossier evaluations and peer reviews, Tenure, and promotion, ensuring academic excellence (2013-Today).

Student Engagement & Mentorship:

- Engaged in undergraduate and graduate student advising, providing guidance and support (2013-2016).
- Mentored all Engineering Technology students and supervised senior design projects (2013-present).
- Mentored Mechatronics Engineering Technology students and supervised competitive student projects, like (HATCH, 2016; CURS 2015).
- Evaluated industry cooperative education reports and conducted employer site visits to ensure comprehensive experiential learning.

Program Development & Enhancement:

- Initiated and structured the Mechatronics Engineering Program and Robotics Engineering, including curriculum design and resource allocation (2016- Today).
- Played a pivotal role in obtaining ETAC-ABET accreditation for the Engineering Technology, and Mechatronics Engineering program (2013- Today).
- Contributed to the development of core robotics courses, keeping pace with industry trends and academic standards (2017-Today).

Outreach & Recruitment:

- Regularly participated in key program recruitment events, aiding in student enrollment and engagement (2013-Today).
- Developed and taught a creative STEM workshop for underrepresented middle and high school students, focusing on Mechatronic Sculptures, at the Toledo Museum of Art.

Facility & Resource Expansion:

- Instrumental in enhancing departmental educational facilities, incorporating advanced, multimillion-dollar equipment (2016-Today).

Extra-Curricular Initiatives:

- Founded and oversee the "Falcon Robotics" Club, Falcon BEST Robotics and Summer Camps; fostering practical skills and team collaboration among students (since 2015).
- Manage the Robotics program website, ensuring up-to-date content and student accessibility (since 2015).

Representational Roles:

- Served as the department's library representative, graduate faculty representative, and undergraduate college council representative, among others liaising effectively between students, faculty, and administrative units (2013-Today).

XIV. Course Development & Teaching

Course Development:

- TECH6710: Automation and Robotics in Advanced Manufacturing, launched in 2019.
- ENGT 4000: Advanced Modeling, Simulation & Analysis
- ROBO2080: Industrial Robotics, launched in 2017.
- ROBO4500: Senior Design Project, launched in 2017.
- TECH6800: Advanced Modeling & Simulation of Mechatronics Systems, launched in 2017.
- TECH5860/Tech6820: Advanced Industrial Robotics, launched in 2017.
- ENGT4800/Tech4950: Introduction to Robotics, launched in 2015.
- ENGT1020: Introduction to Engineering Tech., launched in 2013.
- ENGT1100: CAD, launched in 2015.
- ENGT2480: Dynamics, launched in 2014.
- ENGT3280: Thermodynamics, launched in 2014.
- ENGT1020: Introduction to Engineering Tech., launched in 2013.
- MATH2910: Applied Engineering Mathematics with Applications, launched in 2019.
- ROBO1010: Sensors & Actuators, launched in 2017.
- ROBO 3131 Introduction to Robotics: Kinematic and Control, launched in 2022.
- ROBO 3210 System Dynamics, launched in 2022.
- ROBO 3232 Robot Operating Systems, launched in 2022.
- ROBO 3133 Microfabrication and Semiconductor Processes, launched in 2022.
- ROBO 3032 Biomedical Device Technology, launched in 2022.
- ROBO 4033 MEMS Finite Element Analysis, launched in 2022.

Undergraduate Course Taught:

- ENGT 4500, ECET 4500, ROBO 4500: Senior Design project (Fall/Spring, 2014-2023)
- MTM/ENGT 2400: Statics (Fall, 2019-2023)
- MTM/ENGT 2480: Dynamics (Spring, 2014-2023)
- ROBO2080: Industrial Robotics (Spring, 2017-2021)
- ROBO1010: Sensors & Actuators (Fall, 2017)
- ENGT 4000: Advanced Modeling, Simulation & Analysis (Fall, 2017-2019)
- ENGT 3280: Thermodynamics (Fall, 2014-2017)

- ENGT1020: Introduction to Engineering Tech (Fall, 2014-2016)
- ENGT1100: CAD (Fall, 2015)

Graduate Course Taught:

- TECH 6500: Seminar in Renewable Energy (Spring 2021)
- TECH 6710: Automation and Robotics in Advanced Manufacturing (Spring 2019,2021)
- TECH 6800: Modeling, Simulation, and control of Mechatronics Systems (Spring 2016-2018)
- TECH5860/Tech6820: Advanced Industrial Robotics (Spring 2015)
- TECH 6790: Research and Development in Technology (Fall 2014)

XV. Programs Development & Accreditation

- Led the development of the Bachelor of Science in Robotics Engineering degree Program, a minor of robotics engineering, and also assisted in establishing the School of Engineering at Bowling Green State University, with student enrollment anticipated to start in 2024.
- Initiated and launched the interdisciplinary Bachelor of Science in Mechatronics Engineering Technology Program at Bowling Green State University in 2014, blending multiple engineering disciplines for practical industrial applications, with student intake beginning in 2016.
- Directed and obtained the first-ever ABET/ETAC accreditations for the Mechanical and Mechatronics Engineering Technology programs at Bowling Green State University in 2017 and 2019, respectively, by crafting assessment tools and self-study reports, and addressing evaluators' feedback, and achieved a six-year accreditation renewal for the latter in 2022.

XVI. Awards and Recognitions

- Received the Citizen Diplomat Certificate from the North Texas Council for International Visitors, Department of State, 2011.
- Honored with the International Academic Service Award from Hashemite University, Jordan, 2011.
- Listed in Madison Who's Who Among Executives and Professionals, Honors Edition, 2009.
- Awarded the CGS/UMI Distinguished Dissertation Award at UTA, 2008.
- 1st Best Student Award for Highly Innovative and Out-of-the-Box Concepts at UTA, 2008.
- Marquis Who's Who in the World, 2010, and Marquis Who's Who in America, 2010.
- Granted the STEM Fellowship from the Automation & Robotics Research Institute, 2006-2008.
- Received the Herman Fellowship at UTA, 2007.
- Beneficiary of the Hashemite University Doctoral Fellowship, Jordan, 2003-2006.
- Won the 1st Best Symposium Paper Award at the Nano- & Micro-Smart Systems Symposium, Australia, 2006.
- Achieved the 2nd Best Conference Paper at TeXMEMS VII, Texas, 2005.
- Selected for the IEAST/DAAD scholarship, Freiburg, Germany, 2000.
- Awarded Best Undergraduate Capstone Project in Mechanical Engineering by the Jordan Engineers Society, 2000.

XVII. Selected Certifications

- Fanuc robotics certified instructor: Handling, Programming and Vision system
- Operation/Maintenance of Mitsubishi Robots Certification, *Rixan Associate, OH. 2016*
- NSF, NIH Grant Technical Writing Training Certification, *Cleveland State University*. 2014
- ANSYS APDL and Workbench Certification, *Phoenix Analysis & Design Technologies, AZ., 2010*