

Israa Azzam, Ph.D.

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🌐 Personal Webpage

Education

- 📖 **Ph.D in Technology, Purdue University, West Lafayette, U.S.** **August 2025**
Thesis Title: Transforming Teleoperation through Immersive Digital Twin: XR-Enabled Teleoperation Platform for Industrial Operations.
Thesis Advisor: Professor Farid Breidi
Work Funded by the National Science Foundation (NSF).
GPA: 4/4
- 📖 **M.E. in Mechanical Engineering, American University of Beirut, Lebanon** **September 2021**
Thesis Title: Semi-Definite Programming (SDP) Approach for Robust State PD Control Design for Descriptor Systems.
Thesis Advisor: Professor Dany Abou Jaoude
Work Supported by the University Research Board (URB) at the American University of Beirut.
GPA: 4/4
- 📖 **B.Sc. in Mechanical Engineering, Beirut Arab University, Lebanon** **January 2019**
Project Title: Design and Implementation of a Smart Industrial Handling Unit (Semi-Automated Forklift).
Project Funded by the Industrial Research Achievement in Lebanon.
GPA: 3.83/4

Professional Appointment

- 👤 **Milwaukee School of Engineering (MSOE), Milwaukee, WI** **August 2025-Ongoing**
Assistant Professor at the Department of Mechanical Engineering

Awards, Honors, and Achievements

- 🏆 **Best Paper Award: ASEE Industrial Engineering Division** **2026**
Awarded by ASEE Industrial Engineering Division for the paper titled "*Exploring Team Dynamics and Cognitive Workload in Mixed Reality Collaborative Learning Environments*".
- 🏆 **Best Paper Award: IISE Annual Conference** **2025**
Awarded by the IISE for the paper titled "*Investigating the Impact of Stress on Shared Mental Models and Team Performance in Collaborative Mixed Reality Environments*".
- 🏆 **National Science Foundation (NSF) Travel Support Award** **2025**
Awarded by NSF to attend the 2025 ASEE Conference.
- 🏆 **Best Poster Award: First Place** **2024**
Awarded by Industrial Engineering Operation Management (IEOM) World Congress for the research titled "*Transforming Teleoperations through Immersive Digital Twins: A Collaborative Extended Reality (XR) Environment for Remote Operations*".
- 🏆 **National Science Foundation (NSF) Travel Support Award** **2024**
Awarded by NSF to attend the IEOM World Congress.
- 🏆 **Best Paper Award: ASEE Manufacturing Division** **2024**
Awarded by ASEE Manufacturing Division for the paper titled "*Teaching Manufacturing Assembly Processes Using Immersive Mixed Reality*".
- 🏆 **Best Paper Award: ASEE Industrial Engineering Division** **2024**
Awarded by ASEE Industrial Engineering Division for the paper titled "*Mixed Reality as a Teaching Tool for Improving Spatial Visualization in Engineering Students*".
- 🏆 **Bravo Award: Employee Recognition for Departmental Achievements** **2024**
Awarded by Purdue University Polytechnic Institute in 2024 for outstanding contributions.
- 🏆 **Best Student Poster Presentation Award: First Place** **2023**
Awarded by the 2023 Polytechnic Research Impact Area Student Poster Symposium: Realize Digital Enterprise (RDE) for the research titled "*Mixed Reality Technology: A Design Validation Tool for Engineering Applications*".

Awards, Honors, and Achievements (continued)

Best Presentation in Onsite Session

2023

Awarded by the 2023 9th International Conference on Computer Technology Applications in Vienna, Austria for the presentation titled "An Investigation of Learning Process with Mixed Reality Technology in STEM Education: The case for a computer-based educational".

Research Funding and Grants

Federal Grants National Science Foundation (NSF)

NSF Improving Undergraduate STEM Education (IUSE) Proposal

Submitted Proposal (Pending Review)

- **Project Title:** Collaborative Research: Enhancing Spatial Reasoning and Learning in Undergraduate Statics Through Representationally Enriched Instruction.
- **Funding Agency:** National Science Foundation (NSF), Improving Undergraduate STEM Education (IUSE: EDU) Program.
- **Role:** Co-Principal Investigator (MSOE Site PI).
- **Project Description:** Multi-institutional collaborative research project investigating how physical, augmented reality (AR), hybrid, and symbolic instructional representations influence spatial reasoning, conceptual understanding, and problem-solving in undergraduate statics through representationally enriched learning environments.
- **Collaborating Institutions:** Utah State University (Lead), Purdue University, Georgetown University, and Milwaukee School of Engineering (MSOE).
- **MSOE Subaward:** \$80,000

Internal Grants

A²I² Curriculum Development Grant

Awarded Grant

- **Project Title:** Integrating Applied AI into MEC 1910: Computer Applications in Engineering.
- **Funding Agency:** Milwaukee School of Engineering (MSOE)
- **Project Description:** Development of AI-enhanced pre-lab learning modules, foundational AI literacy instruction, structured AI-assisted debugging activities, and ethical AI-use guidelines to support A²I² certification under the Foundational Knowledge dimension.
- **Project Period:** Summer 2026
- **Grant Amount:** \$5,000

MSOE Mindset and Course Learning Outcome (CLO) Integration Grant Project

Awarded Grant

- **Project Title:** Integrating the MSOE Mindset and Common Learning Outcomes into MEC 4770: Fluid Power Systems
- **Funding Agency:** Milwaukee School of Engineering (MSOE)
- **Project Description:** Developed and implemented simulation-based and laboratory-integrated learning activities to foster the MSOE Value Creators mindset and the CLOs Think Critically and Exhibit Curiosity through fluid power system modeling, experimentation, and engineering decision-making.
- **Project Period:** Summer 2026
- **Grant Amount:** \$5,000

Graduate Grant Writing Experience (As a Graduate Research Assistant)

Federal Grants National Science Foundation (NSF)

🔍 Research Initiation in Engineering Formation (RIEF) Program

Grant Awarded in Full

- **Project Title:** Developing Spatial Visualization and Understanding of Complex Systems via Interactive Mixed Reality Modules.
- **Principle Investigator:** Professor Farid Breidi
- **Co-Principle Investigator:** Professor Paul Asunda
- **Award Number:** 2204919
- **Contributing Tasks:**
 - Wrote significant sections of the proposal (Project Rationale/Vision, Background, and Research plan) and developed figures and diagrams for the proposal document.
 - Assisted with addressing the reviewers' comments and concerns regarding the technical aspect of the work and the experimental design.
 - Co-led the technical planning and implementation aspects of the project.
- **Grant Amount:** \$224, 996

🔍 Ideas Lab

Grant Awarded in Full

- **Project Title:** PEL Engineering Playground: Intelligent Augmented Reality for Personalized Learning Informed by Environmental Identity Development
- **Principle Investigator:** Professor Farid Breidi
- **Award Number:** 2431980
- **Contributing Tasks:** Contributed to the literature review, background research, and the development of figures and diagrams for the proposal document.
- **Grant Amount:** \$300, 000

🔍 EHR Core Research

Not Awarded Grant

- **Project Title:** Transforming STEM Education: Integrating Emerging Technologies into Middle and High School Classrooms through Purdue's RET Site
- **Principle Investigator:** Professor Farid Breidi
- **Contributing Tasks:** Contributed to the writing of the proposal (Project Vision, Background, and Study Framework) and developed figures and diagrams for the proposal document.
- **Grant Amount:** \$499, 448

Internal Grants

🔍 Course-based Educational Innovations at Scale Purdue Innovation Hub

Not Awarded Grant

- **Project Title:** Democratizing the use of Digital Reality Experiences in the classroom
- **Principle Investigator:** Professor Farid Breidi
- **Co-Principle Investigator:** Professor Garcia Bravo
- **Contributing Tasks:** Contributed to the writing of the proposal (Introduction & Background and Study Framework) and developed diagrams for the proposal document.
- **Grant Amount:** \$40, 000

Graduate Research Experience

Graduate Research Assistant

2022–2025

Polytechnic Institute, Purdue University, West Lafayette, IN, U.S.

Advisor: Professor Farid Breidi

Collaborators: Professors Jose Garcia, Gaurav Nanda, and Faisal Aqlan

► NSF RIEF: Developing Spatial Visualization and Understanding of Complex Systems via Interactive MR Modules

- Designed, developed, and implemented interactive Mixed Reality (MR) Modules to enhance spatial visualization skills and learning of complex engineering concepts within engineering technology courses.
- Incorporated MR modules into engineering technology courses (MET: 230 and MET: 432)
- Conducted research studies and collected and analyzed data to evaluate the effectiveness of MR modules in enhancing learning outcomes.
- Authored four manuscripts as the first author, two of which received **Best Paper Awards**.
- **Software Stack:** 3ds Max, SolidWorks, Blender, Unity, MRTK2

► Internal Engineering Education Project: Improving Engineering Instruction through XR Technologies

- Collaborated with faculty members and industry mentors.
- Designed, developed, and incorporated XR applications in engineering technology courses.
- Conducted natural language processing (NLP) and statistical descriptive data analysis.
- Authored two journals and five conference papers as the first author.
- **Software Stack:** 3ds Max, SolidWorks, Unity, MRTK2, OVR, Text Analysis Toolbox on Matlab.

Research Scholar (Visiting Scholar)

2021–2022

Polytechnic Institute, Purdue University, West Lafayette, IN, U.S.

Advisor: Professor Farid Breidi

Collaborators: Professors Jose Garcia and Jiansong Zhang

► Hydraulic End-Effector Design for Construction Robotics and Automation

- Developed conceptual designs for a hydraulic gripper end-effector.
- Designed, modeled, and simulated the hydraulic gripper end-effector.
- Authored one conference proceeding as the first author.
- **Software Stack:** 3ds Max, Solidworks, MATLAB/ Simulink & Simscape-SimMechanics.

► Improving Hydraulic Hybrid Systems Performance through Digital Hydraulics

- Modeled, simulated, and controlled a series hydraulic hybrid transmission that aims to improve fluid power systems' performance and efficiency through the incorporation of digital hydraulics.
- Integrated experimental data into a Matlab/Simscape simulation model.
- Improved the total efficiency of the series hydraulic hybrid drivetrain by up to 25%.
- Authored one journal paper as the first author.
- **Software Stack:** MATLAB/ Simulink & Simscape-SimMechanics.

► Fluid Power Club in the National Fluid Power Vehicle Challenge

- Assisted the Fluid Power Club in the design of a hydraulically actuated bike by conducting mechanical and hydraulic simulation models for the hydraulic bike on Matlab/simscape Multi-body.
- Participated in the National Fluid Power Vehicle Challenge, hosted by the National Fluid Power Association (NFPA).
- Traveled with the Fluid Power Club at a National level in Colorado.
- Co-authored a conference proceeding paper.

Graduate Research Experience (continued)

Graduate Research Assistant

2019–2021

Mechanical Engineering Department, American University of Beirut, Lebanon

Advisor: Professor Dany Abou Joaudy

Co-Advisor: Professor Elie Shamma

► Developing Numerical Methods for Designing Control Laws for Descriptor Systems

- Proposed new methods for synthesizing state-space controllers to tackle the stabilization problem of linear time-invariant (LTI) descriptor systems, with a particular focus on leveraging convex optimization techniques framed within linear matrix inequalities (LMIs).
- Designed, implemented, and validated state-space PD, D, PID, and LQR-LQG controllers utilizing the proposed methods, tackling the stability problem of mechanical and electrical descriptor systems.
- **Software Stack:** C++, MATLAB-Yalmip, MATLAB-Simscape Multibody.

Graduate Teaching Experience

Graduate Teaching Assistant

2022–2025

Polytechnic Institute, Purdue University, West Lafayette, IN, U.S.

Course Instructor: Professor Farid Breidi

► MET: 230 Fluid Power (Fall 2022 & Spring 2023)

- Re-designed all the labs.
- Taught and graded the re-designed lab modules for 100 students registered in seven sections.

► MET: 432 Hydraulic Motion Control Systems (Spring 2024)

- Taught two labs per week for 35 students registered in the course.
- Graded the lab assignment, reports, and final project for the 35 student.
- Designed a new laboratory session focusing on pneumatic gripper control and operation. This involved developing the gripper model, designing the pneumatic circuit, creating a simulation model, and 3D printing the gripper kits.

Visiting Teaching Assisting

2021–2022

Polytechnic Institute, Purdue University, West Lafayette, IN, U.S.

Course Instructor: Professor Farid Breidi

► The labs of the MET: 230 Fluid Power

- Supported the collaborative development of new CFD simulation labs in partnership with Simerics Mp+ company.
- Assisted the teaching assistant in teaching and grading seven laboratory sessions per week for over 90 students registered in the course.

► The labs of the MET: 432 Hydraulic Motion Control Systems

- Taught and graded the entire lab assignments along with the projects for 30 students registered in the course.
- Designed the final lab project by developing, modeling, and simulating a Simulink-Simscape model for a Hydraulic Actuator with Analog Position Controller.

Graduate Teaching Experience (continued)



Graduate Teaching Assistant

2019–2021

Mechanical Engineering Department, American University of Beirut, Lebanon

Course Instructors: Professor Naseem Daher and Eng. Jihad Kasaman

► Graduate level course MECH: 653 Control System Analysis and Design

- Graded weekly assignments, laboratory reports, quizzes, and project submissions.
- Designed tutorial sessions and extra problems.
- Conducted weekly problem-solving sessions and tutorials, and supervised exam administration.

► Undergraduate level course MECH: 436 Control Systems

- Graded weekly assignments, laboratory reports, quizzes, and project submissions.
- Oversaw the evaluation process for the 100 students enrolled in the course.

► Undergraduate level course MECH: 230 Dynamics

- Graded weekly assignments and quizzes for around 150 registered in the course.
- Proctored exams and graded mid and final exams.

Publications

Journal Articles

- 1 K. Bello, I. **Azzam**, F. E. Breidi, and F. Aqlan, "Interpersonal physiological synchrony in mixed reality manufacturing environments: Evaluating shared mental models in dyadic and triadic teams," *IISE Transactions on Occupational Ergonomics and Human Factors*, vol. 0, no. 0, pp. 1–18, 2026. DOI: 10.1080/24725838.2026.2645067.
- 2 I. **Azzam**, K. Bello, F. E. Breidi, and F. Aqlan, "Analysis of user experience in extended reality: A comparative study of vr and mr for manufacturing training," *Manufacturing Letters*, vol. 46, pp. 77–82, 2025, ISSN: 2213-8463. DOI: <https://doi.org/10.1016/j.mfglet.2025.10.003>.
- 3 I. **Azzam**, K. Bello, F. E. Breidi, and F. Aqlan, "Collaborative problem-solving in mixed reality manufacturing environments," *Manufacturing Letters*, vol. 46, pp. 118–122, 2025, ISSN: 2213-8463. DOI: <https://doi.org/10.1016/j.mfglet.2025.10.018>.
- 4 H. M. A. Mageed, I. **Azzam**, and F. Breidi, "State of electrical metrology and possible advancements utilizing extended reality," *MAPAN*, pp. 1–13, 2025. DOI: 10.1007/s12647-024-00795-6.
- 5 I. **Azzam**, S. Das, G. Nanda, J. Garcia-Bravo, and F. Breidi, "Investigating Safety Awareness in Assembly Operations via Mixed Reality Technology," *IISE Transactions on Occupational Ergonomics and Human Factors*, pp. 1–17, 2024. DOI: 10.1080/24725838.2024.2431112.
- 6 I. **Azzam**, K. El Breidi, F. Breidi, and C. Mousas, "Virtual reality in fluid power education: Impact on students' perceived learning experience and engagement," *Education Sciences*, vol. 14, no. 7, 2024, ISSN: 2227-7102. DOI: 10.3390/educsci14070764.
- 7 I. **Azzam**, J. Hwang, F. Breidi, J. Lumkes, and T. Salem, "Automated method for selecting optimal digital pump operating strategy," *Expert Systems with Applications*, vol. 232, p. 120 509, Dec. 2023, ISSN: 0957-4174. DOI: 10.1016/J.ESWA.2023.120509.
- 8 I. **Azzam**, K. Pate, F. Breidi, M. Choi, Y. Jiang, and C. Mousas, "Mixed reality: A tool for investigating the complex design and mechanisms of a mechanically actuated digital pump," *Actuators*, vol. 12, no. 11, p. 419, 2023. DOI: 10.3390/act12110419.

- 9 K. Pate, I. **Azzam**, F. Breidi, J. R. Marschand, and J. H. Lumkes, "Digitalization of radial piston pumps through internal mechanically actuated designs," *Actuators*, vol. 12, no. 11, 2023, ISSN: 2076-0825.  DOI: 10.3390/act12110425.
- 10 I. **Azzam**, K. Pate, J. Garcia-Bravo, and F. Breidi, "Energy Savings in Hydraulic Hybrid Transmissions through Digital Hydraulics Technology," *Energies*, vol. 15, no. 4, p. 1348, Feb. 2022, ISSN: 1996-1073.  DOI: 10.3390/EN15041348.

Conference Proceedings

- 1 I. **Azzam**, K. Bello, F. Breidi, and F. Aqlan, "Mixed reality teleoperation platform for experiential manufacturing education," in *2026 ASEE Annual Conference & Exposition*, Charlotte, North Carolina: ASEE Conferences, Jun. 2026.  DOI: 10.18260/1-2--60182.
- 2 I. **Azzam**, A. Lotfolahpour, and M. Ryan, "Enhanced pbl through ar for early-stage manufacturing design: Supporting brainstorming and low-fidelity prototyping," in *2026 ASEE Annual Conference & Exposition*, Charlotte, North Carolina: ASEE Conferences, Jun. 2026.  DOI: 10.18260/1-2--59409.
- 3 K. Bello, I. **Azzam**, F. Breidi, and F. Aqlan, "Exploring team dynamics and cognitive workload in mixed reality collaborative learning environments," in *2026 ASEE Annual Conference & Exposition*, Charlotte, North Carolina: ASEE Conferences, Jun. 2026.  DOI: 10.18260/1-2--59806.
- 4 I. **Azzam**, K. Bello, F. Breidi, and F. Aqlan, "Analysis of User Experience in Digital Reality: A Comparative Study of VR and MR for Manufacturing Training," in *The 2025 ASEE Annual Conference and Exposition*, Montreal, Canada, 2025.  URL: <https://peer.asee.org/55435>.
- 5 I. **Azzam**, K. Bello, F. Breidi, and F. Aqlan, "Collaborative Problem-Solving in Mixed Reality Environments for Manufacturing Assembly Tasks," in *The 2025 ASEE Annual Conference and Exposition*, Montreal, Canada, 2025.  URL: <https://peer.asee.org/56109>.
- 6 I. **Azzam**, F. Breidi, and F. Aqlan, "From Single-User to Multi-User Mixed Reality: How Collaborative MR Enhances Teamwork and Problem-Solving in STEM Education," in *The 2025 ASEE Annual Conference and Exposition*, Montreal, Canada, 2025.  URL: <https://peer.asee.org/55744>.
- 7 I. **Azzam**, F. Breidi, and F. Aqlan, "Teaching Manufacturing Assembly Processes Using Immersive Mixed Reality," in *The 2024 ASEE Annual Conference and Exposition*, Portland, Oregon, 2024.  URL: <https://peer.asee.org/48063>.
- 8 I. **Azzam**, F. Breidi, F. Aqlan, J. Garcia-Bravo, and P. Asunda, "Mixed Reality as a Teaching Tool for Improving Spatial Visualization in Engineering Students," in *The 2024 ASEE Annual Conference and Exposition*, Portland, Oregon, 2024.  URL: <https://peer.asee.org/47781>.
- 9 H. Jabbour, I. **Azzam**, J. Garcia-Bravo, and F. Breidi, "Development of design, control, and data acquisition modules for fluid power education," in *The 2024 ASEE Annual Conference and Exposition*, Portland, Oregon, 2024.  URL: <https://peer.asee.org/47182>.
- 10 K. Zaidan, I. **Azzam**, D. A. Jaoude, and E. Shammass, "Design of robust pd state feedback controllers for descriptor systems," in *The 2024 European Control Conference (ECC)*, 2024, pp. 3854–3859.  DOI: 10.23919/ECC64448.2024.10590920.
- 11 I. **Azzam**, F. Breidi, M. Akedre, and C. Mousas, "Design Validation of a Mechanically Actuated Digital Pump Using Mixed Reality Technology," in *The 18th Scandinavian International Conference on Fluid Power (SICFP23)*, Tampere, Finland, 2023.
- 12 I. **Azzam**, K. Pate, and F. Breidi, "Mixed reality technology: A virtual training tool in fluid power engineering," in *The 2023 ASME/BATH Symposium on Fluid Power and Motion Control*, Sarasota, Florida, 2023.  DOI: 10.1115/FPMC2023-111715.

- 13 I. **Azzam**, P. Soudah, and F. Breidi, "Virtual Reality: A Learning Tool for Promoting Learners' Engagement in Engineering Technology," in *The 2023 ASEE Annual Conference and Exposition*, Baltimore, Maryland, 2023.  URL: <https://peer.asee.org/44605>.
- 14 Y. Jiang, M. Akdere, M. s. Choi, I. **Azzam**, F. Breidi, and C. Mousas, "An Investigation of Learning Process with Mixed Reality Technology in STEM Education: The Case for a computer-based educational Technology," in *9th International Conference on Computer Technology Applications (ICCTA 2023)*, Vienna, Austria, 2023.
- 15 K. Pate, I. **Azzam**, F. Breidi, J. R. Marschand, and J. Lumkes, "Digital Radial Piston Pump/Motor Designs using Variable Geometry Camshafts," in *The Scandinavian International Conference on Fluid Power (SICFP23)*, Tampere, Finland, 2023.
- 16 I. **Azzam**, F. Breidi, S. Dhar, D. Maiti, J. G. Bravo, and P. Asunda, "Gerotor Pump Simulation Modules for Enhancing Fluid Power Education," in *Proceedings of the BATH/ASME 2022 Symposium on Fluid Power and Motion Control (FPMC2022)*, Bath, UK, 2022.  URL: <https://asmedigitalcollection.asme.org/FPST/proceedings-abstract/FPMC2022/1150217>.
- 17 I. **Azzam**, F. E. Breidi, and J. Zhang, "Hydraulic Gripper Designs for Enhancing Construction Robotics and Automation," in *2022 Polytechnic Summit*, Hochschule Darmstadt, Germany, 2022.  URL: <https://arrow.tudublin.ie/cgi/viewcontent.cgi?article=1001&context=eutpresscon>.
- 18 I. **Azzam**, K. Pate, F. Breidi, and J. Garcia, "Modular Hydrostatic Vehicle used for Engineering Technology," in *The 2022 ASEE Annual Conference and Exposition*, Minneapolis, Minnesota, 2022.  URL: <https://peer.asee.org/modular-hydrostatic-vehicle-used-for-engineering-technology>.
- 19 K. Pate, I. **Azzam**, J. Lumkes, and F. Breidi, "Comparison of Variable Cam Profiles in Mechanically Actuated Digital Fluid Power Systems," in *The 13th International Fluid Power Conference. IFK March 21-23, 2022, Aachen, Germany*, 2022.

Presentations and Poster Sessions

-  **Exploring Team Dynamics and Cognitive Workload in Mixed Reality Collaborative Learning Environments**
 06/23/2026
 2026 ASEE Annual Conference & Exposition, Charlotte, North Carolina, U.S. [Conference]
-  **Enhanced PBL Through AR for Early-Stage Manufacturing Design: Supporting Brainstorming and Low-Fidelity Prototyping**
 06/22/2026
 2026 ASEE Annual Conference & Exposition, Charlotte, North Carolina, U.S. [Conference]
-  **Mixed Reality Teleoperation Platform for Experiential Manufacturing Education**
 06/22/2026
 2026 ASEE Annual Conference & Exposition, Charlotte, North Carolina, U.S. [Conference]
-  **Transforming Teleoperations: An Extended Reality-Enabled Teleoperation Platform for Industrial Operations**
 02/11/2026
 ASME Milwaukee Section, Milwaukee, Wisconsin, U.S. [Invited Speaker]
-  **Extended Reality-Enabled Teleoperation Platform for Industrial Robotic Operations**
 4/11/2025
 School of Engineering Technology (SOET) Research Day, Purdue University, IN, U.S. [Poster]
-  **Transforming Teleoperations through Immersive Digital Twins: A Collaborative Extended Reality (XR) Environment for Remote Operations**
 10/09/2024 – 10/11/2024
 Industrial Engineering and Operations Management (IEOM) World Congress, Detroit, Michigan, U.S. [Poster]

Presentations and Poster Sessions (continued)

-  **Developing Spatial Visualization and Understanding of Complex Systems via Interactive Mixed Reality Modules**
 09/11/2024 – 09/12/2024
 Meeting of the 2024 NSF EEC Grantees Conference, Virginia, Washington, DC, U.S. **[Poster]**
-  **Synchronized Digital Reality (DR) Remote Environments for Seamless Control of Fluid Power Manipulators**
 09/03/2024 – 09/05/2024
 The 2024 International Maha Fluid Power Conference, Purdue University, West Lafayette, IN, U.S. **[Invited Speaker]**
-  **On the Development of Spatial Visual Abilities among STEM Students via Interactive Mixed Reality Modules**
 06/23/2024 – 06/26/2024
 The 2024 ASEE Annual Conference and Expositions, Portland, Oregon, U.S. **[Poster]**
*** Presented under NSF Grantees Poster Session**
-  **Mixed Reality Technology: A Virtual Training Tool in Fluid Power Engineering**
 10/16/2023 – 10/18/2023
 The 2023 ASME BATH Symposium on Fluid Power and Motion Control, Sarasota, Florida, U.S. **[Conference]**
-  **Virtual Reality: A Learning Tool for Promoting Learners' Engagement in Engineering**
 06/25/2023 – 06/28/2023
 The 2023 ASEE Annual Conference and Exposition, Baltimore Convention Center, MD, U.S. **[Conference]**
-  **Design Validation of a Mechanically Actuated Digital Pump Using Mixed Reality**
 05/30/2023 – 06/1/2023
 The 18th Scandinavian International Conference on Fluid Power, Tampere University, Tampere, Finland. **[Conference]**
-  **Fluid Power in the Era of Digital Reality: Exploring Innovations and Applications**
 05/9/2023 – 05/10/2023
 The 2023 Maha Fluid Power Conference, Purdue University, IN, U.S. **[Invited Speaker]**
-  **Extended Reality (XR) for Fluid Power Education**
 04/11/2023 – 04/13/2023
 The 2023 CCEFP Spring Summit, University of Minnesota, MN, U.S. **[Invited Speaker]**
-  **Mixed Reality Technology: A Design Validation Tool for Engineering Applications**
 03/31/2023
 The 2023 Spring Polytechnic Research Impact Area Student Poster Symposium: Realize Digital Enterprise (RDE), Purdue University, IN, U.S. **[Poster]** *** Best Student Poster Presentation Award**
-  **Gerotor Pump Simulation Modules for Enhancing Fluid Power Education**
 09/14/2022 – 09/16/2022
 The 2022 ASME BATH Symposium on Fluid Power and Motion Control, Bath University, Bath, U.K. **[Conference]**
-  **Hydraulic Gripper Designs for Enhancing Construction Robotics and Automation**
 06/28/2022 – 06/30/2022
 The 2022 Polytechnic Summit, Darmstadt University of Applied Sciences, Germany. **[Conference]**
-  **Modular Hydrostatic Vehicle used for Engineering Technology**
 06/26/2022 – 06/29/2022
 The 2022 ASEE Annual Conference and Exposition, Minneapolis Convention Center, MN, U.S. **[Conference]**

Academic and Community Service

 Manuscript Reviewer	2022-Ongoing
The American Society of Mechanical Engineers (ASME). American Society of Engineering Education (ASEE). Journal of Advanced Technological Education (JATE). Journal of Expert Systems with Applications (ESWA). Journal of Engineering Technology (JET). Archive of Mechanical Engineering. Energies.	
 Secretary/Newsletter Editor	2026-Ongoing
Manufacturing Division at the American Society of Engineering Education (ASEE).	
 Regional Conference Coordinator	2025
Manufacturing Division at the American Society of Engineering Education (ASEE).	
 Conference Session Moderator	2024-Ongoing
Industrial Engineering Division at the American Society of Engineering Education (ASEE).	
 Treasurer and Primary Contact	2023-2024
Polytechnic Graduate Student Organization (PGSO), Purdue University, U.S.	
 Volunteer Contributor	2021-2022
Fluid Power Club (FPC), Purdue University, U.S.	

Professional Associations

Elected Member of Phi Kappa Phi Honor Society at Purdue University	2024-Ongoing
Member of the American Society of Engineering Education (ASEE)	2022-Ongoing
Member of the American Society of Mechanical Engineers (ASME)	2022-Ongoing

Skills

-  **Programming Languages:** C++, Visual Basic, Block Programming, $\LaTeX$.
-  **CAD Design Software:** AutoCAD, 3ds Max, SolidWorks.
-  **Modeling/Simulation:** MATLAB-Simulink/Simscape, LABVIEW, Proteus, Automation Studio.
-  **Control/Optimization:** Convex Programming, Mathematica, Yalmip, ROS.
-  **Gaming Engines and Toolkits:** Unity, Blender, Mixed Reality Toolkit, Oculus VR, AR Foundation.
-  **Text Analysis:** Natural Language Processing (NLP), Sentiment Analysis, Topic Modeling.
-  **Languages:** English, Arabic

References

- Dr. Farid Breidi:** Assistant Professor at the School of Engineering Technology (SOET) at Purdue University, U.S. ✉ breidi@purdue.edu ☎ 765-496-5140
- Dr. Faisal Aqlan:** Associate Professor for Industrial Engineering in Engineering Management Programs at the University of Louisville, U.S. ✉ faisal.aqlan@louisville.edu ☎ 814-315-7690
- Dr. Jose Garcia:** Associate Professor at the School of Engineering Technology (SOET) at Purdue University, U.S. ✉ jmgarcia@purdue.edu ☎ 765-494-7312
- Dr. Gaurav Nanda:** Assistant Professor at the School of Engineering Technology (SOET) at Purdue University, U.S. ✉ gnanda@purdue.edu ☎ 765-496-3380
- Dr. Christos Mousas:** Associate Professor at the Computer Graphic Technology (CGT) Department at Purdue University, U.S. ✉ cmousas@purdue.edu ☎ 765-496-0633