Ali Barenji, PhD

Last Update 7/30/2025

Contact Information

Department of Mechanical Engineering
New Mexico Institute of Mining and Technology
Socorro, NM 87801 USA

Phone: (575)835-5109
E-mail: ali.barenji@nmt.edu
Website: Link

Executive Summary

Researcher and educator with deep expertise in Industry 4.0, smart manufacturing, digital twins, and XR (AR/VR) technologies. Experienced in developing data-driven and model-based systems to support intelligent decision-making in manufacturing and logistics. Passionate about human-centered technologies that augment rather than replace human operators. Proven success in research funding, interdisciplinary teaching, and applied industrial projects.

Academic Appointments

Assistant Professor
Department of Mechanical Engineering, New Mexico Tech, Socorro, NM
Aug 2025 – Present

- Teach undergraduate and graduate courses on control systems and robotics (ROS-based).
- Lead ARISE Lab focused on adaptive, intelligent systems for manufacturing and logistics.

Affiliate Visiting Assistant Professor
School of Industrial and Systems Engineering, Georgia Institute of Technology, Atlanta, GA
Aug 2024 – Present

- Co-director of SIREN Lab; led XR-based supply chain game project.
- Coordinated XR makerspace lab funded by ISYE.

Assistant Professor
Department of Technology, Illinois State University, Normal, IL
Aug 2024 – Jul 2025

- Taught interdisciplinary engineering and management courses.
- Led curriculum development and ABET accreditation coordination.
- Served on department-level committees and scholarship panels.

Sr. Research Scientist
School of Industrial and Systems Engineering, Georgia Institute of Technology
Dec 2019 – Jul 2024

- Co-PI on multiple funded projects ($2M+).
- Advised 15+ students and led immersive manufacturing and logistics research.

Lecturer
Department of Mechatronics Engineering, Kennesaw State University
Aug 2018 – May 2019

- Taught mechanical and mechatronics engineering courses.
- Supervised senior capstone teams and developed control labs.

Postdoctoral Research Associate
Computer Integrated Manufacturing Lab, MIT, and GDUT
Jan 2017 – Jan 2018

Industry Appointments

Co-Founder
Immersive Tech Hub, Atlanta, GA
Sep 2020 – Present

- Developed VR/AR software tools for workforce education and training.

Tooling/Machine Design Engineer
Iran Tractor Industrial Group
Sep 2007 – Mar 2011

Education

Ph.D. in Mechanical Engineering (Systems Engineering Major)
Eastern Mediterranean University, Department of Mechanical Engineering – Famagusta, Cyprus
Thesis: *A Novel Multi-Agent-Based Agile Manufacturing Planning and Control System*
Sept 2013 – Dec 2016

M.Sc. in Mechanical Engineering
Eastern Mediterranean University, Department of Mechanical Engineering – Famagusta, Cyprus
Thesis: An RFID-Based Distributed Control System for Flexible Manufacturing Systems
Sept 2011 – June 2013

B.Eng. in Manufacturing Technology (Major: Machine Design)
University of Tabriz – Tabriz, Iran
Sept 2004 – June 2009

Training and Certificate

- The Systems Modeling Language (SysML) – Udemy, 2023
- Lean Six Sigma Green Belt Certification, 2021
- The Complete Python Pro Bootcamp – Udemy, 2020
- Modeling, Simulation, and Control Using Python, 2021
- Data Visualization with Tableau Specialization, 2018
- Create Interactive Dashboards in Python with Plotly Dash – Udemy, *Date not specified*
- CCI: CNC (Computer Numerical Controlled) Production Specialist Certification – ITM, 2008
- CSWE – Certified SolidWorks Expert in Mechanical Design, 2009
- SMSCP: Siemens Mechatronic Systems Certification Program (Level 1), 2016
- Virtual Reality (VR) Development with Unity3D, 2020

Sponsored Research Projects

- **PI, NMT-** *Adaptive Cognitive XR Systems for Deep Space Autonomy*, NASA NIAC Phase I(Submitted)

Duration: 2025-2026, $175,000

- **PI, NMT-** *AI-Driven XR-Enabled Adaptive Human–Autonomy Teaming for Tactical Naval Operations,* FY25 Long Range Broad Agency Announcement for Navy and Marine Corps Science & Technology (Submitted)

Duration: 2025-2028, $275,000

- **PI, *Georgia*** *– Artificial Intelligence in Manufacturing Project 2b: Technical Workforce Development* Project Title: *XR-Based Safety Training for Electric Vehicle Battery Manufacturers*

Duration: 2024–2026, $250,000

- **Co-PI -** *Engineering for One Planet Mini-Grant Program*

Project Title: Sustainable and Environmentally Aware Materials Selection for Construction and Engineering
Duration: 2024–2025, $8,000

- **Co-PI -** *MiTek – USA*

Project Title: Immersive Hyperconnected Modular Construction Platform
Duration: 2022–2024, $1,500,000

- **Co-PI,** *ISYE – Georgia Tech*

Project Title: Metaverse Laboratory for Smart Manufacturing Course
Duration: 2021–2023, $250,000

- **PI,** *Relogistics – USA*

Project Title: Data-Driven Assessment of the Next Generation of the Pallet Recycling System
Duration: 2022–2023, $100,000

- **Co-PI -** *MiTek – USA*

Project Title: Robotized Modular Construction 1: Digitalization and Facilities Design
Duration: 2021–2022, $1,000,000

- **Co-PI-** *ALDI South – USA*

Project Title: Intelligent Inventory Network Project (INVENT): Phase 1
Duration: 2021–2023, $150,000

- **Team Member,** *Nissan – USA*

Project Title: Data-Driven Models for Dynamic Vehicle Distribution Logistics
Duration: 2019–2020, $500,000

- **Team Member,** *State of Georgia – Safe and Secure Elections Program*

Project Title: Safe and Secure Election
Duration: 2019–2021, $100,000

- **PI,** *National Natural Science Foundation of China*

Project Title: Research on Personalized Product Design Requirements Based on the Intelligent Interactive Narrative Generation and Inference Model
Duration: 2017–2019, $50,000

Teaching Experiences

New Mexico Tech
Assistant Professor, Department of Mechanical Engineering

- Dynamic Systems & Controls (Undergraduate)
- Manipulator based Robotics (Graduate)

Illinois State University
Assistant Professor, Department of Technology

- Intro to Technical Drawing & Constraint-Based Solid Modeling (Undergraduate)
- Mechanical Properties of Materials (Undergraduate)
- Manufacturing Organization and Management (Undergraduate – Capstone Team Project)
- Project Implementation and Control (Graduate – MBA Program)

Kennesaw State University
Lecturer, Department of Mechatronics Engineering

- Robotics Analysis and Synthesis
- Mechatronics Engineering Fundamentals
- Modeling and Feedback Control
- Robotics Analysis and Synthesis Laboratory
- Feedback Control Laboratory
- Introduction to Mechatronics Engineering Laboratory

Mentoring

Capstone Project Supervisor

- Design and Development of a Human-Centered Robotic ASRS (Automated Storage and Retrieval System)
- Design and Manufacture of a Customer Demand-Based AI Desk Lamp
- Design and Manufacture of a Human-Friendly Assembly Line for Business Card Holders Based on Lean Manufacturing Principles
- Development of a Robot Control System Using Web Application and RFID Technology
- DC Motor Simulation in MATLAB

Graduate Student Supervision

- Jorge Garcia – Leveraging Immersive Technologies to Develop a Framework for Assessing Worker Training in Reverse Logistics
- Xinlai Liu – An Industrial Blockchain-Based Framework for Product Lifecycle Management in Industry 4.0
- Max Cichocki – Hyperconnected Logistics Platform for Heavy-Duty Machinery: Leveraging Physical Internet Principles to Drive the Composting Industry
- Hanyang Guo – Toward a Blockchain and Fog Computing Collaborative Design and Manufacturing Platform

Technical Proficiencies

- CAD Software: SolidWorks, AutoCAD, SketchUp
- Simulation Software: AnyLogic, FlexSim, MATLAB
- Data Analytics & Visualization: Power BI, Tableau, Plotly Dash
- Programming Languages: Python, Java, PHP, PLC, VBA

- IoT Platforms & Devices: Raspberry Pi, Arduino, Particle Electron
- Virtual & Augmented Reality Platforms: Unity3D, Emulate3D, Demo3D
- Modeling Languages: UML, SysML
- Manufacturing Skills: CNC Machining, Precision Measurement, Mechanical Troubleshooting, Blueprint/Specification Reading & Analysis, 3D Printing

Professional Memberships

- Institute of Electrical and Electronics Engineers (IEEE) – Professional Member (since 2019)
- American Society of Mechanical Engineers (ASME) – Member (since 2017)
- Institute for Operations Research and the Management Sciences (INFORMS) – Member
- Institute of Industrial and Systems Engineers (IISE/ISyE) – Member
- AI-Manufacturing Georgia – Member

Service

Service to Funding Agencies

- NSF Reviewer, Panelist for STEM Education & Learning Research

Service to the Department and University (Illinois State University – ISU)

- ABET Coordinator, Department of Technology
- Scholarship Committee Member
- Member, Diversity and Inclusion Committee

Service to the Profession

- Guest Editor, Sensors – Special Issue on Virtual Reality and Sensing Techniques for Humans [
- Virtual Judge, eCYBERMISSION High School STEM Competition – www.ecybermission.com
- Seminar Organizer, Faculty and Student Seminars (Georgia Tech)
- Accreditation Coordinator, Criteria and Supporting Documents (Kennesaw State University)
- Curriculum and Program Development, Committee Member (Eastern Mediterranean University)

Journal Reviewer

- Robotics and Computer-Integrated Manufacturing
- International Journal of Computer Integrated Manufacturing
- International Journal of Production Research
- Computers & Industrial Engineering
- IEEE Internet of Things Journal
- IEEE Transactions on Engineering Management
- Transportation Research Part E: Logistics and Transportation Review
- Sensors
- Automation in Construction

Conference Service and Talks

- Session Chair, *19th International Technology, Education and Development Conference* – Session on Metaverse
- Session Chair, *10th International Physical Internet Conference (IPIC 2024)* – Session on Smart Manufacturing
- Session Chair, *6th IEOM Conference 2016* – Production Planning and Management
- Topic Organizer, *IEEE CASE 2019*
- Technical Program Committee Member, *CSM 2017*
- Committee Member, *2020 International Conference on Blockchain and Trustworthy Systems*

Awards and Honors

- Outstanding Researcher in Systems Engineering, Georgia Institute of Technology, 2021
- Travel Grant Recipient, Future Engineering Faculty and Professionals Program, Eastern Mediterranean University, 2015 & 2016
- Selected Honoree, *Who's Who in the World*, 2016
- Full Scholarship Recipient, master's and Ph.D. Programs
- Best Paper Award (Young Researcher Category), International Conference on Industrial Engineering and Operations Management, 2015
- National University Entrance Exam: Ranked 42nd among over 45,000 participants

Peer-Reviewed Publications (Selected)

https://scholar.google.com/citations?user=vZP0N3oAAAAJ&hl=en

1) **Barenji A,** Garcia JE, Montreuil B. A Modular XR Collaborative Platform for Occupational Safety and Health Training: A Case Study in Circular Logistics Facilities. Information. 2024 Sep 18;15(9):570. https://doi.org/10.3390/info15090570
2) **Barenji AV**, Montreuil B, Babalou S, Nazzal D, Benaben F, DeMillo R. "An Agent-Based Simulation Platform for a Safe Election: From Design to Simulation". Information. 2023; 14(10):529. https://doi.org/10.3390/info14100529.
3) Cichocki, M., **Barenji, A. V**., Montreuil, B., & Landschützer, C. (2023). Hyperconnected Logistic Platform for Heavy-Duty Machinery: Leveraging Physical Internet Principles to Drive the Composting Industry. Sustainability, 15(17), 12898. https://doi.org/10.3390/su151712898
4) **Barenji, Ali V**., and Benoit Montreuil. "Open Logistics: Blockchain-Enabled Trusted Hyperconnected Logistics Platform." *Sensors* 22.13 (2022): 4699. https://doi.org/10.3390/s22134699
5) Liu X, **Barenji Ali V**, Li Z, Montreuil B, Huang GQ. Blockchain-based smart tracking and tracing platform for drug supply chain. Computers & Industrial Engineering. 2021 Sep 8.https://doi.org/10.1016/j.cie.2021.107669
6) Li, Z., Zhong, R.Y., Tian, Z.G.., **Barenji, A.V.** and Huang, G.Q. **"**Industrial Blockchain: A state-of-the-art Survey". *Robotics and Computer-Integrated Manufacturing* (2021). https://doi.org/10.1016/j.rcim.2021.102124.
7) **Barenji, Ali V.,** Guo, H., Wang, Y., Li, Z., & Rong, Y. "Toward blockchain and fog computing collaborative design and manufacturing platform: Support customer view". *Robotics and Computer-Integrated Manufacturing(*2021), https://doi.org/10.1016/j.rcim.2020.102043
8) **Barenji, Ali V,** Liu, X., Guo, H. and Li, Z. "A digital twin-driven approach towards smart manufacturing: reduced energy consumption for a robotic cellular." *International Journal of Computer Integrated Manufacturing*, (2020). https://doi.org/10.1080/0951192X.2020.1775297
9) **Barenji, Ali** V, Li, Z., Wang, W.M., Huang, G.Q. and Guerra-Zubiaga, D.A. Blockchain-based ubiquitous manufacturing: a secure and reliable cyber-physical system. *International Journal of Production Research*, (2019). https://doi.org/10.1080/00207543.2019.1680899
10) **Barenji, Ali V,** W. M. Wang, Zhi Li, and David A. Guerra-Zubiaga. "Intelligent E-commerce logistics platform using hybrid agent-based approach." *Transportation Research Part E: Logistics and Transportation* Review 126 (2019). https://doi.org/10.1016/j.tre.2019.04.002
11) Wang, W. M., Z. G. Tian, Z. Li, **Barenji Ali V** and M. N. Cheng. "Supporting the construction of affective product taxonomies from online customer reviews: an affective-semantic approach." *Journal of Engineering Design* (2019). https://doi.org/10.1080/09544828.2019.1642460
12) Zhi Li, **Barenji Ali V**, Ray Y. Zhong, George Q. Huang. "Bi-Objective Hybrid Flow Shop Scheduling with Common Due Date". *Operational Research* (2019). https://doi.org/10.1007/s12351-019-00470-8
13) Li, Zhi, **Barenji Ali V**, and George Q. Huang. "Toward a blockchain cloud manufacturing system as a peer-to-peer distributed network platform." *Robotics and Computer-Integrated Manufacturing* 54 (2018). https://doi.org/10.1016/j.rcim.2018.05.011
14) **Barenji Ali V**, and Reza Vatankhah Barenji. "Improving multi-agent manufacturing control system by indirect communication based on ant agents." *Proceedings of the Institution of Mechanical Engineers, Part I: Journal of Systems and Control Engineering* 231, no. 6 (2017). https://doi.org/10.1177/0959651817705990
15) **Barenji, Ali V**, Reza Vatankhah Barenji, Danial Roudi, and Majid Hashemipour. "A dynamic multi-agent-based scheduling approach for SMEs." *The International Journal of Advanced Manufacturing Technology* (2017). https://doi.org/10.1007/s00170-016-9299-4
16) **Barenji Ali V**, Reza Vatankhah Barenji, and Majid Hashemipour. "Flexible testing platform for employment of RFID-enabled multi-agent system on flexible assembly line." *Advances in Engineering Software* 91 (2016). https://doi.org/10.1016/j.advengsoft.2015.08.010
17) Azizi, Aydin, **A. Barenji**, R. Barenji, and M. Hashemipour. "Modeling mechanical properties of FSW thick pure copper plates and optimizing it utilizing artificial intelligence techniques." *Sensor Netw Data* Commun 5, no. 142 (2016): 2.

18) Azizi, **A., Barenji**, R. V., Barenji, A. V., & Hashemipour, M. Microstructure and mechanical properties of friction stir welded thick pure copper plates. *The International Journal of Advanced Manufacturing Technology*, 86, 1985-1995(2016). https://doi.org/10.1007/s00170-015-8330-5
19) Barenji, A. V. "The microstructure and mechanical properties of prolonged and lower temperature aged Fe–Ni–Mn–Mo–Ti–Cr maraging steel". *Materials Science and Engineering Technology,*46, no. 11 (2015): https://doi.org/10.1002/mawe.201500441

Conference Papers and Presentation

1) **Ali Barenji**, Jorge Garcia, Benoit Montreuil, (2024 May). Immersive Occupational Safety and Health Training: A Modular Virtual Reality-Based Process and Platform. *2024 IISE Annual Conference and Expo.*
2) **Ali Barenji**, Jorge Garcia, Benoit Montreuil, (2024 May). Leveraging on Immersive Technologies to Develop a Framework to Assess Worker Training in Reverse Logistics. *2024 IISE Annual Conference and Expo*
3) Cichocki, M. **Barenji, A.V**. and Montreuil, B., 2023, June. Physical Internet based Hyperconnected Logistics Platform Enabling Heavy-Duty Machinery Sharing in the Composting Industry: A Simulation-Based Scenario *Investigation. In Proceedings of the 9th International Physical Internet Conference (IPIC), Athens, Greece (pp. 13-15)*.
4) **Barenji, A.** V,Moradkhani, N., Benaben, F., Montreuil, B., & Nazzal, D. (2021, June). Physics of decision for polling place management: a case study from the 2020 USA presidential election. In ICMS 2021-15th *International Conference on Modeling and Simulation (Vol. 15, No. 9, pp. 440-448).*
5) **Barenji A**., Leon Mcginnis, Shannon Buckley. (2021, Dec). Designing and implementing operational controllers for a robotic tote consolidation cell simulation; Winter Simulation Conference 2021
6) **Barenji, A. V**., Li, Z., & Wang, W. M. (2018, June). Blockchain Cloud Manufacturing: Shop Floor and Machine Level. In *Smart SysTech 2018; European Conference on Smart Objects, Systems and Technologies* (pp. 1-6). VDE.
7) Li, Zhi, Layne Liu, **Barenji A V**, and Waiming Wang. "Cloud-based Manufacturing Blockchain: Secure Knowledge Sharing for Injection Mould Redesign." *Procedia CIRP* 72 (2018): 961-966.
8) Roudi, D., **Barenji Ali V**, & Hashemipour, M. (2016). A Dynamic Multi Agent based scheduling for flexible flow line manufacturing system accompanied by dynamic customer demand. *International Conference on Industrial Engineering and Operations Management*.
9) **Barenji Ali**., & Degirmenci, C. (2015, January). Robot control system based on web application and RFID technology. In MATEC Web of Conferences (Vol. 28). *EDP Sciences.*
10) **Barenji Ali**., Barenji, R. V., & Sefidgari, B. L. (2013, August). An RFID-enabled distributed control and monitoring system for a manufacturing system. In Innovative Computing Technology (INTECH), 2013 Third International Conference on (pp. 498-503). IEEE.