CHENG CHEN

Tel:321-305-1613 | Cheng.chen@uah.edu | LinkedIn | GitHub | Website | ResearchGate | ORCID

EDUCATION

Doctor of Philosophy, Mechanical Engineering July 2022
University of Georgia
Dissertation: "Realization of Inter-Model Connections: Linking Requirements and Computer-Aided Design"

Master of Science, Aerospace Engineering Nov 2016
Florida Institute of Technology
Thesis: "A Maximum Entropy Approach to Identifying Important Statistical Moments to Best-Represent Spray Distribution Data"

Bachelor of Engineering, Mechanical and Automation May 2012
Central College of BUPT, Beijing, China

ACADEMIC EXPERIENCE

University of Alabama in Huntsville – Industrial & Systems Engineering and Engineering Management: Huntsville, AL
Aug 2024 – Present

- Assistant Professor (Tenure Track)
- Director, Integrated Computing Lab
- Co-director, Digital X Lab

University of Georgia – College of Engineering: Athens, GA
2022 – 2024

Postdoc and Instructor (Supervisor: Dr. Jaime Camelio)

Research:

- Prepared and submitted grant proposals for National Science Foundation (NSF)
- Led the development of two industry-focused project proposals, resulting in $135,000 in funding and collaborative partnerships with Pharma Tech Industries
- Managed the publication process for 7 peer-reviewed articles in high-impact journals/conferences and oversaw the creation and delivery of over 20 presentations at major international conferences
- Led and mentored a dynamic interdisciplinary research team, consisting of 6 Ph.D. students, 3 Master's students, and 5 Bachelor's students from diverse engineering disciplines
- Designed and implemented experimental data collection on assembly lines, encompassing thorough data acquisition, validation, and exploratory data analysis
- Participated in key design- and manufacturing-related research discussions at international conferences, contributing to 2 panel discussions and publishing articles in leading academic journals in the field
- Mentored a high-impact capstone project in collaboration with General Motors, focusing on the application of data science techniques for detecting defects in EV battery cells

Teaching and Engagement:

- Designed and delivered an innovative curriculum for ENGR 3140 Thermodynamics and ENGR 2120 Statics, each a 3-credit course, engaging an average of over 50 students per class
- Participated in faculty training focused on Diversity, Equity, and Inclusion (DEI) and student development, both at departmental (Engineering Education Transformations Institute) and university-wide levels (Center for Teaching and Learning)
- Engaged in Faculty Interest Groups, contributing insights to discussions on CURO, including seed grant applications, as well as on topics of leadership and research resource training
- Coordinated and hosted 2 educational events, 'Demystifying Graduate School' and 'Balancing Life in Academia,' each drawing over 30 participants and fostering insightful discussions among attendees

Graduate Research Assistant (Advisor: Dr. Beshoy Morkos) Aug 2019 – July 2022

- Worked alongside advisor to lead the charge on the development of a new research lab in design and manufacturing. This included identifying a location, resources, equipment, and infrastructure required
- Published multiple papers (both journal and conference proceedings) while also supporting junior graduate students in learning how to write

- Presented at multiple conferences in front of leading researchers from across the world at ASME International Design Engineering Technical Conference (IDETC) and ASEE's National Conference
- Mentored four junior lab members as they pursued their M.S., provided them with advice concerning work-life balance, expectations, research guidance, and fundamentally taught them how to become researchers
- Served as a paper reviewer for multiple conferences based on areas of design, manufacturing, and design education
- Assisted in writing a program description and program proposal to start a graduate program with an emphasis in design and manufacturing
- Led a *writing week* at the end of the semester where graduate students focused on writing papers
- Supported PI with NSF proposal preparation by reviewing the project description and adding content
- Contributed to the acquisition of industry-funded projects through site visits, problem discovery, client discussions, and proposal writing

Florida Institute of Technology – Dept. of Mechanical & Aerospace Engr. Melbourne, FL
Research Assistant Aug 2018 – Aug 2019

- Worked alongside advisor (PI: Beshoy Morkos) on NSF funded research on requirement change propagation. Moved to UGA (see above) with PI to continue Ph.D. studies

Graduate Student Aug 2013 – Dec 2016
(Advisor: Dr. Mark Archambault)

- Studied the effect of fourth-order moments to calculate droplet probability density functions using the Maximum Entropy Formulism
- Developed and optimized an existing C research code with the implemented Message Passing Interface (MPI)
- Performed error and frequency analysis to identify the most important fourth order moments
- Investigated best representation of experimental spray data using high-frequency moments with their corresponding lower moment combinations to reduce the heavy computational cost
- Worked as a grading assistant for MAE 3161 Fluid Mechanics (Dr. Paavo Sepri), MAE 3191 Engineering Thermodynamics 1 (Dr. Ju Zhang), MAE 3162 Compressible Flow (Dr. Hamid Hefazi), MAE 2201 Aerospace Fundamental (Dr. Rusovici Razvan and Dr. Wilde Markus), MAE 4263 Rockets and Mission Analysis (Dr. Daniel Kirk)

INDUSTRIAL PROJECTS EXPERIENCE

University of Georgia Athens, GA
Wells Fargo Data Science Competition Mar 2021

- Implemented exploratory data analysis, feature selection, and classification using Logistic Regression, Random Forest, and XGBoost
- Completed a comprehensive 15-page report and developed an accompanying 12-page presentation slide

Florida Institute of Technology Melbourne, FL
Alstom Mesh Network Exploration Project Sept 2018 –Mar 2019

- Investigated various types of Communication Overhead Management (COM) for Precision Timing Control (PTC) within the mesh network model, including sensor types and radio technology/communication methods
- Developed a scaled physical prototype demonstrating the wireless mesh network's ability to mitigate associated challenges

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PROPOSALS:

Grants:

- Smart Manufacturing using AI-based Revolutionary Technologies (SMART), Industry-University Research Partnerships – NSF, $0, Role: Faculty Associate, 2025

PUBLICATIONS:

Journal Publications (7 published/accepted, 1 submitted, 6 in preparation)

Published/Accepted:

1. Yorston, C., **Chen, C.**, Camelio, J., (2025), Optimizing Industrial Data Collection with Interactive Testbed: A Siemens MindSphere Case Study, Journal of Engineering Manufacture, DOI: 10.1177/09544054241260928
2. Buggineni, V., **Chen, C.**, Camelio, J., (2024), Synthetic Data Generation in Advanced Manufacturing: Opportunities and Applications, Frontiers In Manufacturing Technology, Frontiers In Manufacturing Technology 4: 1320166, DOI: 10.3389/fmtec.2024.1320166

3. Htet Hein, P., **Chen, C.**, Kames E., Morkos, B., 2023, A Network Interference Approach to Analyzing Change Propagation in Requirements, Journal of Computing and Information Science in Engineering, Journal of Computing and Information Science in Engineering, 1-54. DOI: https://doi.org/10.1115/1.4065273
4. **Chen, C.**, & Morkos, B. (2023). Exploring topic modelling for generalising design requirements in complex design. Journal of Engineering Design, 1-19. https://doi.org/10.1080/09544828.2023.2268850
5. Mullis, J., **Chen, C.**, Morkos, B, and Ferguson, S. (2023). Efficacy of Deep Neural Networks in Natural Language Processing for Classifying Requirements by Origin and Functionality: An Application of BERT in System Requirement. ASME. J. Mech. Des. https://doi.org/10.1115/1.4063764
6. Htet Hein, P., Kames E., **Chen, C.**, Morkos, B., (2022). Reasoning support for predicting requirement change volatility using complex network metrics, Journal of Engineering Design (2022): 1-27. https://doi.org/10.1080/09544828.2022.2154051
7. Htet Hein, P., Kames E., **Chen, C.**, Morkos, B., (2021). Employing Machine Learning Techniques to Assess Requirement Change Volatility, Research in Engineering Design, 32(2), 245-269, DOI: 10.1007/s00163-020-00353-6

Submitted:

1. Carroll, C. L., **Chen, C.**, Morkos, B., (2025) Relating System Requirements and Descriptions Through Contextual Embeddings, Journal of Mechanical Design

In Preparation:

1. **Chen, C.**, Morkos, B., Improving Design Requirements Based on Customer Feedback, Journal of Computing and Information Science in Engineering
2. Lopez, S., Childress, B., Wooley, A., Alim, E.., Brown-Cantrel, B., Morris, T., **Chen, C.**, Modeling Industrial Cyber Threats: A Benchmark Dataset and Threat Map for Programmable Logic Controllers, INFORMS
3. Gibson, J., **Chen, C.**, RAG-KG: A Multimodal Knowledge Graph Reasoning Framework in Requirements Engineering, JMD
4. Kilgo, C., **Chen, C.**, Bridging Intent and Implementation: A Cross-Domain Dataset for Aligning Engineering Requirements and Functional Code through Retrieval-Augmented Generation, JCISE
5. Olusegun, S., **Chen, C.**, Agentic Reinforcement Learning with Retrieval-Augmented Generation for Cross-Domain Semantic Alignment, IDETC

Conference Proceedings (8 peer-reviewed conference publications)

1. Johns, P. M., & **Chen, C.** (2025). AIM-E: AI-Driven Inspection for Manufacturing on the Edge. In International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (Vol. 89206, p. V02AT02A048). American Society of Mechanical Engineers.
2. Carroll, C. L., Yang, X., **Chen, C.**, & Morkos, B. (2024). Exploring Latent System Design Description and Requirement Similarities Using Transformer Based Contextual Embeddings. In International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (Vol. 88353, p. V02BT02A008). American Society of Mechanical Engineers.
3. **Chen, C.,** Carroll, C., & Morkos, B. (2023). From Text to Images: Linking System Requirements to Images Using Joint Embedding. Proceedings of the Design Society, 3, 1985-1994.
4. Mozaffar, F., **Chen, C.**, Morkos, B., & Ma, J. (2023). Development of a Manufacturing Assessment Survey to Promote Entrepreneurial Mindset in Engineering. In 2023 ASEE Annual Conference & Exposition.
5. **Chen, C.,** Wei, S., & Morkos, B. (2023). Bridging the Knowledge Gap Between Design Requirements and CAD-A Joint Embedding Approach. In 2023 ASEE Annual Conference & Exposition.
6. Farid, M., **Chen, C.**, & Morkos, B., et al. Meta-SeL: 3D-model Shape-Net Core Classification using Meta-Semantic Learning, Computer Science, Computer Engineering, Computer Engineering, & Applied Computing (CSCE 2022)
7. **Chen, C.**, Mullis, J., & Morkos, B. (2021). A Topic Modeling Approach to Study Design Requirements. In *International Design Engineering Technical Conferences and Computers and Information in Engineering Conference* (Vol. 85383, p. V03AT03A021). American Society of Mechanical Engineers.
8. **Chen, C.**, Olajoyegbe, T. O., & Morkos, B. (2020). The Imminent Educational Paradigm Shift: How Artificial Intelligence Will Reframe how we Educate the Next Generation of Engineering Designers. In *2020 ASEE Virtual Annual Conference Content Access*.

Invited Presentation: (No paper)

1. **Chen, C.** & Thomas, D. "Streamlining Requirements with LLMs: A Path to Affordable, Integrated Defense", Space & Missile Defense Symposium 2025
2. **Chen, C.** "Leveraging Large Language Model for Knowledge-Driven Design and Manufacturing Intelligence", Materials-Manufacturing-Machine Learning Nexus (M3X) conference 2025

TEACHING EXPERIENCE:

1. COURSES TAUGHT:

UAH:

- ISE 423/523 Intro Statistical Quality Control S25

- ISE 726 System Modeling S25
- Honor 301: Large Language Models: Understanding, Ethics, and Impact F25
- ISE 430/530 Manufacture System & Facilities Design F24, F25

UGA:

- ENGR 2120 Engineering Statics F22
- ENGR 3140 Engineering Thermodynamics S23, F23, S24

2. GUEST LECTURE:

- GenCyber Summer School - "Data on a Mission: Keeping Secrets Safe!" S25
- CPE 495/488 Computer Engineering Design/Cybersecurity Engr Design F25
- GITAM School of Business Hyderabad – Intro to NLP: Topic Modeling F22
- CSCI 1360 - Informatics and Data Analytics S22
- ENGR 6900/MCHE 4900 - Design Methodologies and Advanced Manufacturing S22
- ENGR 6990/MCHE 4900 - Advanced Vehicle Manufacturing F21

3. EXTERNAL TALK

- University of Georgia M3X conference: Leveraging Large Language Model for Knowledge-Driven Design and Manufacturing Intelligence, May 18, 2025

***4.* PEDAGOGICAL AND PROFESSIONAL TRAINING:**

- NSF AI-EDSE Workshop: Artificial Intelligence in Engineering Design and Systems Engineering (2025)
- NSF CMMI's DCC Career Mock Panels
- NSF CMMI's Game Changer Academies
- edX- An Introduction to Evidence-Based Undergraduate STEM Teaching
- Advancing Learning Through Evidence-Based STEM Teaching
- Leadership Development: Reflection on Leadership
- Certificate in Diversity and Inclusion (CDI): Countering Unconscious Bias
- Preparing for the Job Market: The Diversity Statement Workshop
- How Learning Works: Engaging Students with Active Learning Workshop
- Preparing for the Job Market: The Teaching Statement Workshop
- Certificate in Academic Advising (CAA)

RESEARCH SERVICE:

1. Peer-Review Service

Journal:

- Journal of Mechanical Design (JMD)
- Journal of Engineering Design (JED)
- Journal of Computing and Information Science in Engineering (JCISE)
- Research in Engineering Design (RED)
- Scientific Reports (Springer Nature)

Conferences:

- International Design Engineering Technical Conferences (IDETC)
- Manufacturing Science and Engineering Conference (MSEC)
- American Society for Engineering Education (ASEE)

2. PhD Committee Member:

Ongoing:

- Isabelle S. Brown-Cantrell
- Einaam Alim
- Sheri Leder
- Charles Maranich
- Vishwa Kumar
- Peter Oyewale

3. Systems Engineering Informastion Knowledge Management (SEIKM) Technical Committee

Role: Student Committee Member 2021 - 2022

- Provide input on the strategic plans and activities relating to student sections
- Organize publicity and events for SEKIM

4. University Services

UAH At a Glance: Give introductions to the university and our research lab for high school students. 2025

HONORS, ACTIVITIES, AND SERVICE

1. Awards

- JCISE Reviewers of the Year Award 2025
- UAH: New faculty Research grant ($10,000) 2025
- Provost's Affordable Course Materials Grants ($5000) 2024
- EETI Travel Fellowship ($3125) 2023
- EETI Travel Fellowship ($1445) 2022
- Received an honorable mention in the Wells Fargo data science competition 2021
- ASME CIE Design Poster Award 2020
- Third-Class Scholarship for Outstanding Academic Performance - Central College of BUPT 2021, 2012

2. Professional Associations

- Society of Manufacturing Engineers 2023 – Present
- Alpha Alpha Alpha Honor Society 2022 – Present
- The Design Research Society, DRS 2019 – Present
- American Society of Engineering Education, ASEE 2019 – Present
- UGA Engineering Education Transformation Institute, EETI 2019 – Present
- National Postdoctoral Association 2019 – Present
- American Society of Mechanical Engineers, ASME 2018 – Present
- National Center for Faculty Development & Diversity 2017 – Present
- National Space Club Huntsville 2024 – Present
- The American Institute of Aeronautics and Astronautics, AIAA 2014 – 2015

3. Certificates

- Protecting Youth Training 2023-2025
- USG Code of Conduct 2023-2025
- Arch Ready Professionalism Certificate 2021
- Question. Persuade. Refer., QPR Gatekeeper Certificate (NBCC Provider #5889) 2021
- AutoCAD Senior Application Engineering Certificate 2011
- Crystal Digital Technology Training Certificate 2009 – 2011
- UGA's Non-Discrimination and Anti-Harassment and USG's Sexual Misconduct Policies 2023-2025

Skills and Qualifications

Modelling & Simulation Tools:

- AutoDesk AutoCAD
- AutoDesk Fusion360
- AutoDesk Inventor
- MATLAB Simulink
- MagicDraw
- Solid Works
- Astah SysMl

Languages:

- Mandarin
- English

Programming:

- C/C++
- Python
- Linux
- LaTeX
- HTML
- JavaScript
- R Studio

Toolkit:

- MPI
- CUDA APT
- OpenCL
- OpenMP
- NumPy
- Pandas
- Keras
- Scikit-learn

			▪ TensorFlow ▪ PyTorch ▪ Heroku