# CHENG CHEN

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

*EDUCATION*

***Ph.D. in Mechanical Engineering*** July 2022
Dissertation: *Realization of Inter-Model Connections: Linking Requirements and Computer-Aided Design*
University of Georgia, Athens, GA

***Master of Science in Aerospace Engineering*** Nov 2016
Emphasis in Combustion and Propulsion
Florida Institute of Technology, Melbourne, FL

***Bachelor of Engineering in Mechanical Engineering*** May 2012
Central College of BUPT, Beijing, China

*RESEARCH EXPERIENCE*

**University of Georgia – College of Engineering** Athens, GA
**Postdoc Researcher** Aug 2022 – Present
(Supervisor: Dr. Jaime Andres Camelio)

- Develop grant proposals for both NSF and industrial projects
- Lead an interdisciplinary research team and research projects
- Design and perform experiment: collect, prepare, and analyze research data
- Oversee publication processes, presentations, and provide strategic directions to major projects
- Publish manufacturing related research proceedings at conferences and journals
- Assist with other duties as assigned

**Limited Term Instructor**
(Supervisor: Dr. Bjorn Birgisson)

- Develop and deliver course materials, exams, and assignments that facilitate active learning
- Prepare required reports on students and activities
- Participate in department and university meetings
- Plan and Implement educational projects and events
- Teach and advice engineering statics-related research projects by promoting Interactive learning

**Research Assistant** Aug 2019 – July 2022
(Supervisor: Dr. Beshoy Morkos)

- 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
- Assisting in writing a program description and program proposal to start a graduate program with an emphasis in design and manufacturing
- Lead a *writing week* at the end of the semester where graduate students focused on writing papers
- Supporting advisor with NSF proposal preparation by reviewing the project description and adding content
- Contributing 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

(Supervisor: Dr. Mark Archambault)

- Thesis: A Maximum Entropy Approach to Identifying Important Statistical Moments to Best-Represent Spray Distribution Data
- 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
- Discussed best representation of experimental spray data using high-frequency moments with their corresponding lower moment combinations to reduce the heavy computational cost

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*PROJECTS EXPERIENCE*

**University of Georgia** Athens, GA

**UGA Wells Fargo Data Science Competition** Mar 2021

- Implement exploratory data analysis, feature selection, and classification using Logistic Regression, Random Forest, and XGBoost
- Delivered 15-pages report and 12-pages presentation slide

**Florida Institute of Technology** Melbourne, FL

**Alstom Mesh Network Exploration Project** Sept 2018 – Mar 2019

- Advisor: Dr. Beshoy Morkos
- Investigated of different type of COM for PTC within the mesh network such as the type of sensors, radio technology/communication methods
- Developed a physical, scaled prototype that demonstrates the ability of the wireless mesh network mitigate the challenges associated with the current state of the art

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*WORK EXPERIENCE*

**Limited-term Instructor:** Aug 2022 – Current

University of Georgia:

- Fall 2022: ENGR 2120 Engineering Statics
- Spring 2023: ENGR 3140 Engineering Thermodynamics

**Grading Assistant** Mar 2014 – Nov 2016

Florida Institute of Technology:

- Course subjects: MAE 3161 Fluid Mechanics, MAE 3191 Engineering Thermodynamics 1, MAE 3162 Compressible Flow, MAE 2201 Aerospace Fundamental, MAE 4263 Rockets and Mission Analysis
- Supervisors: Dr. Hamid Hefazi, Dr. Daniel Kirk, Dr. Rusovici Razvan, Dr. Paavo Sepri, Dr. Wilde Markus, Dr. Ju Zhang
- Evaluated 200+ student's homework performance per semester, provided feedback, graded exams, provided office hours, and tabulated grades per semester

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*PROPOSALS:*

**Attempted:**

Kindercore Vinyl, role: post-doc, and total budget: $128,866

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*PUBLICATIONS:*

**Journal Publications (2 published/accepted, 2 submitted, 4 in preparation)**

***In Preparation***

1. **Cheng C.**, Morkos, B., Improving Design Requirements Based on Customer Feedback
2. **Cheng C.**, Morkos, B., Clustering CAD Geometry Models to Design Subassembly, ASME Journal of Mechanical Design

3. **Chen, C.,** Farid, M., Morkos, B., et al. Req2CAD: Realizing Inter-Model Connection Between Design Requirements and Computer-Aided Design

***Submitted***

1. **Cheng C.**, Morkos, B., 2022, A Study of Generalizing Requirements Document Using Design Topics, ASME Journal of Mechanical Design.
2. Mullis, J., Morkos, B., Ferguson S., **Cheng C.,** 2022, Efficacy of Deep Neural Networks in Natural Language Processing for Classifying Requirements by Origin and Functionality: An Application of BERT in System, ASME Journal of Mechanical Design.

***Published/Accepted***

1. Htet Hein, P., Kames, **Cheng, C.**, E., Morkos, B., 2022, Reasoning support for predicting requirement change volatility using complex network metrics, Journal of Engineering Design (2022): 1-27.
2. Htet Hein, P., Kames, **Cheng, C.**, E., 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

**Conference Proceedings (4 peer-reviewed conference publications)**

1. 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)
2. **Chen, C.**, Cody C., Morkos, B., From Text to Images: Linking System Requirements to Images Using Joint Embedding, International Conference on Engineering Design (ICED 2023).
3. Fatmeh M., **Chen, C.**, & Morkos, B., Development of a Manufacturing Assessment Survey to Promote Entrepreneurial Mindset in Engineering, In *2023 ASEE*
4. **Chen, C.**, Siqing Wei, & Morkos, B., Bridging the Knowledge Gap Between Design Requirements and CAD - A Joint Embedding Approach, In *2023 ASEE*
5. **Chen, C.**, Mullis, J., & Morkos, B. (2021, August). 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.
6. **Chen, C.**, Olajoyegbe, T. O., & Morkos, B. (2020, June). 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*.

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*PEDAGOGICAL TRAINING*

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| **edX- An Introduction to Evidence-Based Undergraduate STEM Teaching** | University of Georgia |
| **Advancing Learning Through Evidence-Based STEM Teaching** | University of Georgia |
| **Leadership Development: Reflection on Leadership** | University of Georgia |
| **Certificate in Diversity and Inclusion (CDI): Countering Unconscious Bias** | University of Georgia |
| **Preparing for the Job Market: The Diversity Statement Workshop** | University of Georgia |
| **How Learning Works: Engaging Students with Active Learning Workshop** | University of Georgia |
| **Preparing for the Job Market: The Teaching Statement Workshop** | University of Georgia |
| **Certificate in Academic Advising (CAA)** | University of Georgia |

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| *GUEST LECTURE* | *UNIVERSITY OF GEORGIA* |
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| **GITAM School of Business Hyderabad – Intro to NLP: Topic Modeling** | Fall 2022 |
| **ENGR 6990/MCHE 4900 - Advanced Vehicle Manufacturing** | Fall 2021 |
| **CSCI 1360 - Informatics and Data Analytics** | Spring 2022 |
| **ENGR 6900/MCHE 4900 - Design Methodologies and Advanced Manufacturing** | Spring 2022 |

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*RESEARCH SERVICE AND ACTIVITY*

**Frontiers in Design Representation Summer School (UMD)** **2022**

**Systems Engineering Information Knowledge Management (SEIKM) Technical Committee**

**Student Committee Member** 2021 – 2022

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

**IDETC, ASEE, and JMD Peer Review Specialist** 2019 – Present

- Provide written, unbiased, and constructive feedback based on the intellectual merit of the work

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*HONORS, ACTIVITIES, AND SERVICE*

**Awards**

- Faculty Enrichment Fund 2022
- EETI Travel Fellowship ($1445) 2022
- Received an honorable mention in the Wells Fargo data science competition 2021
- ASME CIE Design Poster Award 2020
- Central College of BUPT - Third-Class Scholarship for Outstanding Academic Performance 2011

**Professional Associations**

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

**Certificates**

- 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

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*SKILLS AND QUALIFICATIONS*

**Modelling & Simulation Tools**

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

**Languages**

- Mandarin
- English

**Programming**

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

**Toolkit**

- MPI
- CUDA APT
- OpenCL
- OpenMP
- Numpy
- Pandas
- Keras
- TensorFlow
- Heroku