Zixian Zhu

M.E. Rinker, Sr. School of Construction Management, University of Florida
573 Newell Dr, Rinker Hall, Room 340, Gainesville, FL 32603, USA
(352) 872-8883 | zhuzixian@ufl.edu
Personal Website: https://zhuzixian2020.wixsite.com/zixian

Education

Doctor of Philosophy in Design, Construction, and Planning 2021 – Present
M.E. Rinker, Sr. School of Construction Management, University of Florida, Gainesville, FL, USA
- Dissertation Title: *"Developing and Assessing Safe Human-Drone Communication on Construction Sites"*
- Committee: Dr. Idris Jeelani (chair), Dr. Masoud Gheisari (co-chair),
  Dr. Boyi Hu, Dr. Aladdin Alwisy.

Master of Engineering in Engineering Management 2018 – 2019
School of Civil and Environmental Engineering, Cornell University, Ithaca, NY, USA
- Project Title: *"Feasibility Study for Effluent Thermal Energy Recovery (ETER) at the Ithaca Area Waste Water Treatment Facility"*
- Advisor: Dr. Francis M. Vanek

Bachelor of Management in Engineering Management 2014 – 2018
School of Economics and Management, Beijing Jiaotong University, Beijing, China

Exchange Program in European Management 2017
EM Strasbourg Business School, University of Strasbourg, Strasbourg, France

Research Experience

Research Assistant 2021 – Present
M.E. Rinker, Sr. School of Construction Management, University of Florida, Gainesville, FL, USA
- *"**Investigating the Safety Challenges of Co-drones in Future Construction Workplaces**"*
  Funded by National Science Foundation (NSF)
  o Led research projects on developing and assessing safe **human-drone communication** on construction sites focused on physical risks, psychological impacts, and perceptions, which can inform future technology advancements and safety regulations.
  o Developed a **novel 4D simulation** framework for drone integration in construction, which can serve as a fundamental methodology for future research on human-robot interactions in construction.
  o Led the development for an **immersive VR construction site** as an **education and training platform** for workers, K-12 students, and undergraduates to better understand site environments and robotics applications.
- *"**VR-NCCER Virtual Orientation Site**"*. Funded by National Center for Construction Education and Research (NCCER)
  o Led research on designing and developing of a **mobile-enabled virtual site orientation application**.
  o Evaluated the future potential of the virtual site orientation through a **usability study**.

Research Intern (A 6-months internship awarded by the NSF INTERN program) 2024

Division of Safety Research (DSR) - National Institute for Occupational Safety and Health (NIOSH), Morgantown, West Virginia, USA

- Conducted data analysis to evaluate the influence of human-robot interaction on construction worker safety and assisted with experiment protocol preparation, data collection, and laboratory setup for research projects.

Other Academic Research

- Investigating the Effect of Display Refresh Rate on First-Person Shooting Games (*in collaboration, supervised by Dr. Kristy Boyer, University of Florida*)
- Outreach Project Design: A Pop-Up Interactive Exhibit for Construction Workers (*supervised by Dr. Bruce MacFadden & Dr. Mariela Pajuelo, University of Florida*)
- Challenges and Resolutions of Payment Disputes in the Construction Industry (*supervised by Dr. R. Raymond Issa, University of Florida*)
- Feasibility Study for Effluent Thermal Energy Recovery (ETER) at the Ithaca Area Waste Water Treatment Facility (*in collaboration, supervised by Dr. Francis M. Vanek, Cornell University*)
- Relocation/Density Scenario Planning for Hull, Hingham, and Cohasset, MA (*in collaboration, supervised by Dr. Jennifer Minner, Cornell University*)

Teaching Experience

Teaching Assistant 2021 – Present

M.E. Rinker, Sr. School of Construction Management, University of Florida, Gainesville, FL, USA

- BCN5737 – Advanced Issues in Construction Safety and Health (Spring 2025)
    - o Organized course content, assisted students during class and office hours, and graded assignments and exams
- BCN3431C - Structures (Fall 2024)
    - o Organized course content, assisted students during class and office hours, and graded assignments and exams
- BCN4423C - Temporary Structures (Fall 2023 – Fall 2024)
    - o **Module Instructor** for Earth Supporting Systems and Lifting & Rigging equipment: Instructed, designed, developed, and organized course content
    - o Organized course content, assisted students during class and office hours, and graded assignments and exams
- BCN4252 - Introduction to Building Information Modeling (Spring 2023)
    - o **Guest Reviewer**: reviewed and provided feedback for final projects

Grader 2019

School of Civil and Environmental Engineering, Cornell University, Ithaca, NY, USA

- CEE 6910/ENMGT 5900 - Project Management (Spring 2019)
    - o Graded assignments and exams

Industry Experience

Contracts Engineer 2019 – 2020

China Construction (South Pacific) Development Co Pte Ltd, Singapore

- Prepared material takeoff, monthly payment certificates, and budget estimates based on the work schedule and site conditions

- Investigated material consumption, coordinated with subcontractors, and conducted data analysis for wastage, safety KPIs, meteorological reports, and collaborated with the safety department and consultant

Assistant Engineer Intern 2017

Beijing Huazhu Building Technology Institute, Beijing, China
- Built architectural models, conducted collision detections, developed progress reports & animations, and created building rendering animations

Publications

My Google Scholar profile: https://scholar.google.com/citations?user=p7zMpvoAAAAJ&hl=en

Journal Publications

J1. **Zixian Zhu**, Idris Jeelani, and Masoud Gheisari. 2024. Worker-Drone Communication: Enhancing Safety in Construction Shared Workspaces. ***In Preparation***

J2. **Zixian Zhu**, Jiun-Yao Cheng, Idris Jeelani, and Masoud Gheisari. 2024. Mobile-Enabled Onboarding: Orientation for New Employees at Construction Sites in a Virtual Environment. ***In Preparation***

J3. **Zixian Zhu**, Idris Jeelani, and Masoud Gheisari. 2024. Bidirectional Human-Drone Safety Communication in Construction. ***Under Review***

J4. **Zixian Zhu**, Jiun-Yao Cheng, Idris Jeelani, and Masoud Gheisari. 2024. Using gesture and speech communication modalities for safe human-drone interaction in construction. *Elsevier Journal of Advanced Engineering Informatics*. 62, 102827. https://doi.org/10.1016/j.aei.2024.102827.

J5. Boyi Hu, Shuyan Xia, **Zixian Zhu**, Jiun-Yao Cheng, Yue Luo, Idris Jeelani, and Masoud Gheisari. 2024. Exploring the effect of human-drone communication modality on safety and balance control in virtual construction environments. *Taylor & Francis Journal of Ergonomics*, 1–14. https://doi.org/10.1080/00140139.2024.2380342

J6. **Zixian Zhu**, Idris Jeelani, and Masoud Gheisari. 2023. Physical risk assessment of drone integration in construction using 4D simulation. *Elsevier Journal of Automation in Construction*, 156: 105099. https://doi.org/10.1016/j.autcon.2023.105099.

Refereed Conference Proceedings

C1. **Zixian Zhu**, Idris Jeelani and Masoud Gheisari. Worker-Drone Communication in Construction: Perspectives from Safety Experts. *Proceedings of 61st Annual Associated Schools of Construction (ASC) International Conference*. ***Under Review***

C2. **Zixian Zhu**, Idris Jeelani and Masoud Gheisari. 2024. Establishing Safe Human-Drone Communication for General Construction Workers. *Proceedings of ASCE Computing in Civil Engineering Conference (i3CE 2024)*. ***In Press***

C3. **Zixian Zhu**, Jiun-Yao Cheng, Idris Jeelani, and Masoud Gheisari. 2024. Construction Students' Safety Perception of the Presence of Drones on Job Sites. *Proceedings of 60th Annual Associated Schools of Construction (ASC) International Conference*, vol 5, 593-601. https://doi.org/10.29007/hvk7.

C4. **Zixian Zhu**, Jiun-Yao Cheng, Idris Jeelani, Masoud Gheisari and Raja R. A. Issa. 2024. Virtual Onboarding: Construction Site Orientation for New Employees in a VR Environment. *Proceedings of ASCE Construction Research Congress (CRC) 2024*, 11-19. https://doi.org/10.1061/9780784485293.002.

C5. **Zixian Zhu**, Jiun-Yao Cheng, Idris Jeelani and Masoud Gheisari. 2023. Safe Human-Drone Interaction in Construction: Using Gesture Communication Modality. *Proceedings of ASCE Computing in Civil Engineering Conference (i3CE 2023)*, 564–570. https://doi.org/10.1061/9780784485224.068.

C6. **Zixian Zhu**, Idris Jeelani and Masoud Gheisari. 2022. Safety Risk Assessment of Drones on Construction Sites using 4D Simulation. *Proceedings of 39th International Symposium on Automation and Robotics in Construction (ISARC 2022)*. 344-351. https://doi.org/10.22260/ISARC2022/0048.

Posters

P1. **Zixian Zhu**, Gilles Albeaino, Jiun-Yao Cheng, Idris Jeelani and Masoud Gheisari. Investigating the Safety Challenges of Co-drones in Future Construction Workplaces. National Science Foundation (NSF) under Grant No. 2024656. 2024 NSF FRR-NRI PI Meeting.

P2. **Zixian Zhu**, Idris Jeelani and Masoud Gheisari. 2024. Establishing Safe Human-Drone Communication for General Construction Workers. *ASCE Computing in Civil Engineering Conference (i3CE 2024)*.

P3. **Zixian Zhu**, Jiun-Yao Cheng, Idris Jeelani, Masoud Gheisari and Raja R. A. Issa. 2024. Virtual Onboarding: Construction Site Orientation for New Employees in a VR Environment. *ASCE Construction Research Congress (CRC) 2024*.

Presentations

CP1. **Zixian Zhu**, Idris Jeelani and Masoud Gheisari. 2024. Establishing Safe Human-Drone Communication for General Construction Workers. Presented at *ASCE Computing in Civil Engineering Conference (i3CE 2024)*.

CP2. **Zixian Zhu**, Jiun-Yao Cheng, Idris Jeelani, and Masoud Gheisari. 2024. Construction Students' Safety Perception of the Presence of Drones on Job Sites. Presented at *60th Annual Associated Schools of Construction (ASC) International Conference*.

CP3. **Zixian Zhu**. 2024. Enhancing Construction Site Safety: Bidirectional Communication Between Workers and Drones. Presented at *ASC First Doctoral Forum, 60th Annual Associated Schools of Construction (ASC) International Conference*.

CP4. **Zixian Zhu**, Jiun-Yao Cheng, Idris Jeelani, Masoud Gheisari and Raja R. A. Issa. 2024. Virtual Onboarding: Construction Site Orientation for New Employees in a VR Environment. Presented at *ASCE Construction Research Congress (CRC) 2024*.

CP5. **Zixian Zhu**, Jiun-Yao Cheng, Idris Jeelani and Masoud Gheisari. 2023. Safe Human-Drone Interaction in Construction: Using Gesture Communication Modality. Presented at *ASCE Computing in Civil Engineering Conference (i3CE 2023)*.

CP6. **Zixian Zhu**, Idris Jeelani and Masoud Gheisari. 2022. Safety Risk Assessment of Drones on Construction Sites using 4D Simulation. Presented at *39th International Symposium on Automation and Robotics in Construction (ISARC 2022)*.

Proposal Writing

Assisted Dr. Idris Jeelani for preparing following grant proposals:
- "**[Integrating Virtual Reality and Large Language Models to Provide Personalized Situated Learning through Adaptive Storytelling](#)**." National Science Foundation (NSF), IUSE program, Oct 2024 – Sep 2027, $400k. PI: Dr. Idris Jeelani.
  - o Contributed to proposal drafting.
  - o Developed preliminary VR environment and virtual agents for the proposal.
- "**Safety of Drone-populated Jobsites of Future: Safe Integration of Drones in Construction**." Submitted to National Institute for Occupational Safety and Health (NIOSH) R21 Grant Program.
  - o Contributed to proposal drafting.
  - o Conducted the preliminary study for the proposal research approach.
- "**Trustworthy Bidirectional Human-Drone Communication to Enhance Work Safety and Worker Wellbeing in Drone-Populated Construction Jobsites of the Future**." Submitted to National Science Foundation (NSF), FW-HTF program.
  - o Contributed to proposal drafting.
  - o Conducted the literature review for the proposal background.
  - o Conducted the preliminary study for the proposal research methodology.

Selected Honors and Awards

A1. **The Graduate School Fellowship,** University of Florida, 2021 − Present
   – *The Graduate School Fellowship is a premier award for PhD students and provides a long-term, competitive, merit-based funding package of four years of support.*
A2. **The Jimmie Hinze Graduate Scholarship**, M.E. Rinker, Sr. School of Construction Management, University of Florida, 2024
   – *This scholarship recognizes graduate students for exceptional contributions to construction safety.*
A3. **The Matthew Remsen Scholarship**, M.E. Rinker, Sr. School of Construction Management, University of Florida, 2022 − 2023
   – *This scholarship recognizes students who continuously achieve high academic standing.*
A4. **The Academic Scholarship of Beijing Jiaotong University**, Beijing Jiaotong University, 2015 - 2018
   – *This scholarship recognizes students who continuously achieve high academic standing (top 10%).*
A5. **Outstanding Student Award**, Beijing Jiaotong University, 2015 - 2016
   – *This award recognizes students who have demonstrated outstanding performance.*

Research Mentoring Experience

Advised and assisted students throughout the process of conducting research, ranging from research design, technical development, conducting experiments, and academic writing. Mentored students:
   – **Parth Bhadaniya** (Ph.D. Student, Construction Management, University of Florida), 2023 − present
   Research Project: *VR-NCCER Virtual Orientation Site*
   – **Haoshen Qin** (M.Sc. Student, Computer Science, University of Florida), 2024
   Research Project: *Investigating the Effect of Display Refresh Rate on First-Person Shooting Games*
     Publication: *Haoshen Qin,* ***Zixian Zhu****. 2024. Investigating the Effect of Display Refresh Rate on First-Person Shooting Games. https://doi.org/10.48550/arXiv.2406.13027.*
   – **Pankaj Warke** (M.Sc. Student, Computer Science, University of Florida), 2023 − 2024
   Research Project: *Investigating the Safety Challenges of Co-drones in Future Construction Workplaces*
     Publication: ***Zixian Zhu****, Idris Jeelani, and Masoud Gheisari. 2024 Bidirectional Human-Drone Safety Communication in Construction.* ***Under Review****.*
   – **Shuyan Xia** (Undergraduate Student, Industrial and Systems Engineering, University of Florida), 2022 − 2023
   Research Project: *Investigating the Safety Challenges of Co-drones in Future Construction Workplaces*
     Publication: *Boyi Hu, Shuyan Xia,* ***Zixian Zhu****, Jiun-Yao Cheng, Yue Luo, Idris Jeelani, and Masoud Gheisari. 2024. Exploring the effect of human-drone communication modality on safety and balance control in virtual construction environments. Ergonomics, 1−14. https://doi.org/10.1080/00140139.2024.2380342.*
   – **Gregorius Budhijanto** (M.Sc. Student, Sustainable Design, Carnegie Mellon University), 2023
   Research Project*: Pathfinding in Robotics and Automation for Sustainable Construction Practices*

Service and Affiliations

Organizing committee

NSF-funded webinar "Safe Human-Robot Interaction in Construction," the University of Florida Rinker School of Construction Management and the National Institute for Occupational Safety and Health (NIOSH), December 2023

Reviewer

   – Elsevier Journal of Automation in Construction
   – ASCE Journal of Construction Engineering and Management

- Associated Schools of Construction (ASC) Conference
- ASCE Construction Research Congress (CRC) Conference
- ASCE International Conference on Computing in Civil Engineering (i3CE)
- International Symposium on Automation and Robotics in Construction (ISARC) Conference

Activities and Volunteering

International Committee & Department Steward, Graduate Assistants United, University of Florida
Volunteer, Alachua County Volunteer Program, Florida
Volunteer, McCarty Woods Restoration Project, University of Florida
Volunteer, Chinese Students and Scholars Association (CSSA), University of Florida

Affiliations

Student Member, Association for Computing Machinery, Special Interest Group on Computer-Human Interaction (ACM SIGCHI)
Student Member, American Society of Safety Professionals (ASSP)
Student Member, American Society of Civil Engineering (ASCE)
Student Member, ASCE Visualization, Information Modeling, and Simulation (VIMS) Committee
Student Member, Florida Education Association (FEA)

Other Skills

Computer

- **Construction Management and Building Information Modeling**
  Autodesk Revit, Autodesk Construction Cloud, Autodesk BIM 360, Autodesk Navisworks, Autodesk AutoCAD, On-screen Takeoff, and Synchro PRO
- **Energy Simulation**
  eQuest
- **Data Analysis**
  R Studio, IBM SPSS, and Matlab
- **Programming**
  Python, R, C, C#, Matlab
- **Design and Rendering**
  Rhino, Lumion, Gravity Sketch and Adobe Premiere Pro
- **VR Development**
  Daz3D, Mixamo, and Unity.
- **Physiological Data Processing and Analysis**
  Empatica, Polar, Bertec

Professional Certifications

30-Hour Safety Training, Occupational Safety and Health Administration (OSHA)

Languages

- English: professional working proficiency
- Chinese (Mandarin): native