GONGFAN CHEN

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Dept. of Engineering Technology and Construction Management
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RESEARCH INTEREST

Human-technology interactions; Large language model (LLM) applications for construction knowledge communications; Blockchain and smart contract applications to enhance project collaboration reliability; Decentralized computing framework for task-level automation; Workflow simulation to enhance project situation awareness; Computer vision algorithms for automated site monitoring and inspections; and Pedagogical framework for AI implementation in STEM education.

EDUCATION

- **North Carolina State University**, Raleigh, NC, U.S.

  Ph.D. in Civil Engineering — Aug 2019 – Aug 2023

  M.S. in Electrical and Computer Engineering — Aug 2021 – May 2023

- **University of Michigan**, Ann Arbor, MI, U.S.

  M.S. in Civil Engineering — Aug 2017 – May 2019

- **North China Electric Power University**, Beijing, China

  B.S. in Engineering and Management — Sept 2013 – June 2017

PROFESSIONAL APPOINTMENTS

- **Assistant Professor,** University of North Carolina-Charlotte, August 2025 - Now
- **Postdoctoral Research Scholar,** North Carolina State University, August 2023 – present
  - Advisor: Dr. Edward Jaselskis
- **Graduate Research Assistant,** North Carolina State University, August 2019 – August 2023
- **Graduate Teaching Assistant,** North Carolina State University, August 2019 – August 2023
- **Graduate Teaching Assistant,** University of Michigan, August 2018 – December 2018
- **BIM Engineer,** China Railway 24th Bureau Group Co., Ltd., May 2018 – August 2018
- **BIM Lecture,** North China Electric Power University (Beijing), January 2016 – June 2016
- **Research Assistant,** North China Electric Power University (Beijing), September 2014 – June 2017

PUBLICATIONS

Referred Journal Articles:

- **[J10]**. Chen, G., Jaselskis, E., Tamer, A., and Folz, A., (2025). "Using a Large Language Model Powered Framework for Automatic Risk Identification and Mitigation from Past Claims and Supplemental Agreements." *Journal of Computing in Civil Engineering*.
- **[J9]**. Diaz, B., Chen, G., Delgado, C., and Jaselskis, E. (2025). "Supporting Generative AI Literacy: Exploring the

Pedagogical Roles Students Assign ChatGPT and Impact on Course Grades." *Comunicar*.

- **[J8]**. Shafaay, M., Alqahtani, F. K., Alsharef, A., and Chen, G. (2025). Modeling construction cost overrun risks at the FEED stage for mining projects using PLS-SEM. *Journal of Asian Architecture and Building Engineering*, 1–17.
- **[J7]**. Chen, G., Alsharef, A., Ovid, A., Albert, A. and Jaselskis, E. (2025). "Meet2Mitigate: An LLM-powered framework for real-time issue identification and mitigation from construction meeting discourse." *Advanced Engineering Informatics,* 64: 103068.
- **[J6]**. Chen, G., Alsharef, A., and Jaselskis, E. (2024). "Construction Jobsite Image Classification Using an Edge Computing Framework." *Sensors,* 24 (20):6603.
- **[J5]**. Chen, G., M. Liu, H. Li, S. M. Hsiang, and A. Jarvamard. (2023). "Motivating Reliable Collaboration for Modular Construction – A Shapley Value-Based Smart Contract." *Journal of Management in Engineering*, 39 (6): 04023042. (Editor's Choice)
- **[J4]**. Chen, G., M. Liu, Y. Zhang, Z. Wang, S. M. Hsiang, and C. He. (2023). "Using Images to Detect, Plan, Analyze, and Coordinate a Smart Contract in Construction." *Journal of Management in Engineering*, 39 (2): 1–18.
- **[J3]**. He, C., M. Liu, Y. Zhang, Z. Wang, S. M. Hsiang, G. Chen, W. Li, and G. Dai. (2023). "Space-Time-Workforce Visualization and Conditional Capacity Synthesis in Uncertainty." *Journal of Management in Engineering*, 39 (2): 04022071.
- **[J2]**. Chen, G., H. Li, M. Liu, S. M. Hsiang, and A. Javanmardi. (2022). "Knowing what is going on – a smart contract for modular construction." *Canadian Journal of Civil Engineering*, 50 (3): 210-223. (Invited paper).
- **[J1]**. He, C., M. Liu, Y. Zhang, Z. Wang, S. M. Hsiang, G. Chen, and J. Chen. (2022). "Exploit Social Distancing in Construction Scheduling: Visualize and Optimize Space–Time–Workforce Tradeoff." *Journal of Management in Engineering*, 38 (4): 1–15.

Referred Conference Articles:

- **[C8]**. Chen, G., Pedraza, M., Albaloul, R., Albert, A., and Jaselskis, E. (2025). "Developing a Fit-for-Purpose Best Practice Knowledge Handbook using Generative AI." *CSCE Construction Specialty Conference / ASCE Construction Research Congress (CRC) 2025*.
- **[C7]**. Chen, G., and Liu, Y. (2025). "Leveraging Large Language Models for Voice-Activated Robotic Teleoperation in Construction." *ASCE International Conference on Computing in Civil Engineering 2025*.
- **[C6]**. Mapare, V., Liu, Y., Zheng, D., and Chen, G. (2025). "Enhancing the Worker-Robot Interaction for Construction Task Operation: A Preliminary Study Using Large Language Model-based Methods." *ASCE International Conference on Computing in Civil Engineering 2025*.
- **[C5]**. Chen, G., Alsharef, A., and Jaselskis, E. (2024). "Enabling Real-Time AI Applications in Construction Site Safety: A Novel Edge Computing Approach for Nails Detection Under Resource-Constrained Environment." *ASCE International Conference on Computing in Civil Engineering 2024*.
- **[C4]**. Chen, G., Alsharef, A., and Jaselskis, E. (2024). "Integrating Sensor-Empowered Federated Learning and Smart Contracts for Automatic Sustainable Infrastructure Management." *ASCE International Conference on Computing in Civil Engineering 2024*.
- **[C3]**. Chen, G., C. He, S. Hsiang, M. Liu, and H. Li. (2023). "A mechanism for smart contracts to mediate production bottlenecks under constraints." *31st Annual Conference of the International Group for Lean Construction (IGLC)*. Lille, France.
- **[C2]**. Li, H., G. Chen, M. Liu, S. M. Hsiang, and A. Jarvamardi. (2023). "Situation awareness based smart contract for modular construction." *Proceedings of the Canadian Society of Civil Engineering Annual Conference 2021*, 363–373. Singapore: Springer Nature Singapore. (Best Student Paper for Awardee: Gongfan Chen).
- **[C1]**. He, C., M. Liu, Z. Wang, G. Chen, Y. Zhang, and S. M. Hsiang. (2022). "Facilitating Smart Contract in Project Scheduling under Uncertainty—A Choquet Integral Approach." *Construction Research Congress 2022*, 930–939.

TEACHING AND MENTORING EXPERIENCE

Undergraduate-Level Course

- **Roles and Responsibilities**: Helped the course instructor design lectures, helped the instructor design term projects, held office hours to guide students on their term projects, worked with students one-on-one to answer their questions, helped grade the course materials, and advised students.

- **CE365 – Construction Equipment and Method**, North Carolina State University, Raleigh (Spring 2021)
- **CE463 - Construction Estimating, Planning, and Control**, North Carolina State University, Raleigh (Fall 2019, Fall 2020, Fall 2021)
- **CE469 – Construction Engineering Project**, North Carolina State University, Raleigh (Spring 2021, Spring 2022, Spring 2023)
- **CEE431 – Construction Contracting**, University of Michigan, Ann Arbor (Fall 2018)

Graduate-Level Course

- **Roles and Responsibilities**: Held weekly lectures for the lab session, helped the course instructor design lectures, helped the instructor design term projects, held office hours to guide students on their term projects, worked with students one-on-one to answer their questions, helped grade the course materials, and advised students.

- **CE564 – Legal Aspects of Contracting**, North Carolina State University, Raleigh (Spring 2022, Spring 2023, Spring 2024)
- **CE567 – Risk and Financial Management in Construction**, North Carolina State University, Raleigh (Fall 2020, Spring 2022, Spring 2023)
- **CE592 – Special Topics in Construction Engineering: CII Best Practices**, North Carolina State University, Raleigh (Fall 2021)
- **CE592 – Special Topics in Construction Engineering: Global Construction Practices**, North Carolina State University, Raleigh (Fall 2023)
    - Class Coordinator with five different universities from four countries, including Tsinghua University (China), Tianjin University (China), Chulalongkorn University (Thailand), University of Lagos (Nigeria), and North Carolina State University (US.)

Mentoring Experience

- **Roles and Responsibilities**: Taught the basic skills of programming; guided the design of research frameworks; taught the fundamentals of AI knowledge; mentored the writing of thesis, and papers.
- **Graduate Student**
    - Anto Ovid Gnanasekar Sahaya Muzhumathi (Civil Engineering), Ph.D. student, NC State University
    - Michael Pedraza (Civil Engineering), graduate student, NC State University
    - Roya Albaloul (Civil Engineering), graduate student, NC State University
    - Myat Mon Aye (Civil Engineering), graduate student, NC State University
    - Zhigao Wang (Civil Engineering), graduate student, Qingdao University of Technology
- **Undergraduate Student**
    - Yongxuan Zhang (Mathematics), NC State University

      Shilun Zhao (Mechanical Engineering), NC State University
    - Hongxu Liu (Engineering Management), North China Electric Power University
- **Associated Schools of Construction (ASC) Region 2 Faculty Mentor**
    - David Daildly (senior, Construction), NC State University

- Sidney Perkinson (senior, Construction), NC State University
- Ruby Cain (junior, Construction), NC State University
- Austin Booth (junior, Construction), NC State University

AWARDS AND CERTIFICATES

- **Travel Grants Award**, NSF Workshop at I3CE2024 Conference, 2024
- **ASCE Journal of Management Editor's Choice**, North Carolina State University, Raleigh, 2023
- **People's Choice Award**, NCSU CCEE 3-Minute Thesis Competition, 2022
- **Best Student Paper Award**, Canadian Society of Civil Engineering Annual Conference, 2021
- **Graduate Merit Award (GMA) Fellowship**, North Carolina State University, Raleigh, 2019
- **Second Place Award**, "Rush Hour" Business Decision-Making and Management Competition, Role: team captain, Beijing, China, 2017
- **Exchange Scholarships**, National Chi Nan University, Puli, Taiwan, 2015
- **First Place Award**, National Business Road Management Decision-making Competition, Role: team Captain, Shanghai, China
- **Department Outstanding Student**, North China Electric Power University (NCEPU), Beijing, China, 2014 – 2017

CERTIFICATE

- **IBM Data Science** Professional Certificate, 2022
- **BIM Engineering Modeling Technical Certificate**, Certificate No. 160090200652, Beijing, China, 2016
- **BIM Engineer (Modeler) Professional License,** Certificate No. BJLJMBIMGCS00690, Beijing, China, 2016

GRANT WRITING EXPERIENCE

- **Advancing TSMO Knowledge Management with Generative AI**, 2024

- Funding Agency: National Science Foundation (NSF)
- Role: Led research GenAI framework design, technical exploration, proposal writing, and coordinated with other PIs
- PI: Dr. George List, Dr. Ali Hajbabaie, and Dr. Edward Jaselskis

- **A Constructivist AI Assistant to Enhance Sustainable Infrastructure Lifecycle Management**, 2024

- Funding Agency: National Science Foundation (NSF)
- Role: Led research framework design, technical exploration, and proposal writing and coordinated with other PIs
- PI: Dr. Edward Jaselskis, Dr. Brayan Diaz, Dr. Arnav Jhala and Dr. Jessica Kaminsky

- **AI-Powered Contract Assistant: Detecting and Improving "Gotcha" Clauses for Fairer and More Balanced Construction Agreements**, 2024

- Role: Led research framework design, technical exploration, and proposal writing and coordinated with other PIs
- PI: Dr. Edward J. Jaselskis, Dr. Arnav Jhala, Dr. Gongfan Chen

- **Phase II: Developing a Fit-for-Purpose Handbook for Effective Implementation of CII Best Practices**, 2023 (Funded: $147,967)

- Funding Agency: Construction Industry Institute (CII)

- Role: Assisted PI with research design, technical details, and proposal writing
- PI: Dr. Edward J. Jaselskis and Dr. Alex Albert

- **Prioritizing NCDOT Bridge Preservation Projects Using Bridge Element Inspection Data**, 2022 (Funded: $223,040)

- Funding Agency: North Carolina Department of Transportation (NCDOT)
- Role: Assisted PI with related literature review, technical details, and proposal writing
- PI: Dr. Daniel Findley, Dr. Min Liu, Dr. George List, Dr. Brad C. McCoy, Dr. Simon Hsiang

PRESENTATION

Invited Lectures:

- **Blockchain-Enabled Smart Contract for the Construction Industry**, CE 4130 Construction Contracts, California State Polytechnic University-Pomona, 2025
- **Leveraging BERTopic Modeling to Identify Risk Categories for Claims and Supplementary Agreements**, CE514- Decision Making and Risk Management in Construction, King Saud University, Saudi Arabia, 2024

Poster Presentation:

- **Meet2Mitigate: An LLM-Powered Framework for Real-Time Issue Identification and Mitigation from Construction Meeting Discourse**, Applied AI in Engineering & Computer Science Symposium, North Carolina State University, 2024

Conference Presentation:

- **Enabling Real-Time AI Applications in Construction Site Safety: A Novel Edge Computing Approach for Nails Detection Under Resource-Constrained Environment**, ASCE International Conference on Computing in Civil Engineering, Pittsburgh, Pennsylvania, 2024
- **Integrating Sensor-Empowered Federated Learning and Smart Contracts for Automatic Sustainable Infrastructure Management**, ASCE International Conference on Computing in Civil Engineering, Pittsburgh, Pennsylvania, 2024
- **A Fit-for-Purpose (F4P) Handbook for Effective Implementation of CII Best Practices**, Construction Research Congress 2024, Des Moines, Iowa, 2024
- **Insights for Effective Risk Management in Transportation Projects**, Transportation Research Board (TRB) Annual Meeting, Washing DC, 2024
- **Situation Awareness Based Smart Contract for Modular Construction**, Canadian Society of Civil Engineering Annual Conference, Niagara Falls, Ontario (Online), 2021

University Competition:

- **Situation Awareness Smart Contracts for Construction Management**, CCEE 5th Annual Three Minute Thesis Competition, North Carolina State University, 2022

PROFESSIONAL AFFILIATION

- **Reviewer**, International Journal of Construction Management, 2025 – Present
- **Reviewer**, Automation in Construction, 2025 – Present
- **Reviewer**, ASCE Journal of Computing in Civil Engineering, 2024 – Present
- **Reviewer**, ASCE Journal of Management in Engineering, 2023 – Present

- **Reviewer**, Construction Innovation, 2022 - Present
- **Reviewer,** Sustainability, 2024 – Present
- **Reviewer,** Buildings, 2024 – Present
- **Reviewer**, ASCE International Conference on Computing in Civil Engineering, Pittsburgh, Pennsylvania, 2024
- **Reviewer**, International Symposium on Automation and Robotics in Construction (ISARC), Dubai, UAE, 2021
- **Associate Member**, American Society of Civil Engineering (ASCE)

INDUSTRY EXPERIENCE

- **BIM Engineer**, China Railway 24th Bureau Group Shanghai Railway Co., Ltd., May 2018 – August 2018, Beijing

- Led a technical team to construct underground utility 3D BIM models for Beijing DaXing airport municipal roads.
- Established a 3D roaming for BIM models and deployed in VR environments to tackle potential clash detection.

SKILLS

- **Language Proficiency:** Professional English, Native Chinese
- **Programming Languages:** Python, JavaScript, SQL, Matlab, R, SAS, Julia, Solidity
- **Tools/Software:** Power BI, Revit, Navisworks, BIM 360, HoloLens, Unity 3D, AutoCAD, Synchro, Lumion, GIS, Bentley, Primavera, Bluebeam Revu, Ganache, MetaMask, TensorFlow, PyTorch, Arena, Stroboscope
- **Hardware:** Raspberry Pi, Jetson Nano, wearable sensors