

Curriculum vitae

Ri Na

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University of Delaware,
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Education

Ph.D. in Engineering, with a focus on Construction Engineering and Management,
Durham School of Architectural Engineering & Construction
University of Nebraska-Lincoln, August 2017

M.S. in Construction Management, with a Minor in Business Administration,
Durham School of Architectural Engineering & Construction,
University of Nebraska-Lincoln, May 2013

Bachelor of Engineering in Construction Estimating,
Department of Civil Engineering,
Chang'an University, Xi'an, China, July 2010

Academic Experience at the University of Delaware

Associate Professor, 2024-present, Department of Civil, Construction, and Environmental Engineering, University of Delaware

Assistant Professor, 2018-2024, Department of Civil, Construction, and Environmental Engineering, University of Delaware

I was promoted to Associate Professor in September 2024. As an Assistant Professor in Construction Engineering and Management at the University of Delaware from August 2018 to August 2024, I developed, taught, and evaluated both required and technical elective courses, advised undergraduate and graduate students, and chaired and actively engaged in doctoral committees. Notably, I also contributed to the ABET accreditation preparation, participating in the initial review for Fall 2022 and the subsequent review for Fall 2023. Additionally, I also assisted in creating and updating innovative curricula, particularly in building information modeling (BIM) and project-based approaches. Additionally, I spearheaded the modernization of classes by integrating cutting-edge technologies, such as drone and laser scanning for surveys, VR for BIM tours, and AR for interior design. These efforts aimed to equip our students with the skills necessary for successful careers in the dynamic field of construction engineering.

The courses that I taught from 2018 to the present include:

CIEG 191 Introduction to Construction Engineering and Management, spring 2020

CIEG 222/LARC 222 Introduction to Surveying, fall 2018, 2019, spring 2021
CIEG 291 CAD and BIM in Construction, fall 2018, 2019, 2020, 2021, 2022, 2023, 2024
CIEG 315 Probability and Statistics, fall 2021
CIEG 367/390 Engineering Survey and Geomatics, spring 2022, 2023, 2025
CIEG 367 Seminar: ASC Competition Mastery, fall 2023
CIEG 391 Construction Estimating/Cost Control, fall 2019, 2020, 2021, 2022, 2023, 2024
CIEG 467-010 Construction Engineering and Management, spring 2020
CIEG 467/667-012 Advanced BIM, spring 2021, 2022, 2023
CIEG 491 CEM Senior Design, spring 2021, 2022, 2023, 2025
CIEG 493 Construction Productivity Improvement, 2024
UNIV 369/468 Undergraduate Research (Independent Study), fall 2020, 2021, 2022, winter 2022, spring 2023

Other Academic Experience

Teaching Assistant, 2013-2017, Durham School of Architectural Engineering and Construction, University of Nebraska-Lincoln

*My duties included preparing lectures and lab notes, creating term projects, conducting lab demonstrations, and grading. **The courses that I assisted with at UNL are as follows:***

CNST 225 Introduction to Building Information Modeling (BIM), fall 2015- spring 2017
AE 2250 Construction Graphics and Design Process (BIM), spring 2016
CNST 440 BIM II, spring 2016
CONE 450 Sustainable Construction, spring 2015
CNST 420 Professional Practice and Ethics, fall 2013 - spring 2015
CNST 131 Introduction to the Construction Industry, fall 2013
CNST 379 Construction Estimating II, spring 2013

Research Assistant, 2011-2017, Durham School of Architectural Engineering and Construction, University of Nebraska-Lincoln

Conducted research on energy-efficient building envelope for the Department of Energy

Professional Experience

Estimator, 2010, China Construction First Building Group Corporation Limited, Tianjin, China

Prepared bidding documents for several billion-dollar construction projects in Tianjin, China. Major responsibilities include 3D BIM quantity takeoff and pricing.

Areas of Active Research

- Advancing energy-efficient building designs and construction through the use of state-of-the-art BIM and computational fluid dynamics (CFD) models.
- Use of aerial and infrared thermography NDE and health monitoring techniques in civil infrastructure.

- Innovative teaching methods for engineering education, specifically utilizing BIM and VR/AR technologies.

Publications

Aljagoub, D., **Na, R.** (2025) “Enhanced Delamination Detection in Concrete Decks via Numerical Simulation and Deep Learning with UAV-IRT”, *Automation in Construction*, Vol. 170, 105940

Cheng, C., Chen, D., Shao, S., **Na, R.**, Cai, H., Zhou, H., & Wu, B. (2024). Revealing the Impact of Depth and Surface Property Variations on Infrared Detection of Delamination in Concrete Structures Under Natural Environmental Conditions. *Buildings*, 15(1), 10.

Cai, H., Cheng, C., Wang, L., Zhang, H., Zhou, J., **Na, R.**, & Wu, B. (2024). Numerical and experimental study on the evolution of thermal contrast for infrared detection of debonding in concrete filled steel tubular structure. *Applied Thermal Engineering*, 124743.

Cheng, C., Cheng, X., Zhang, H., Cai, H., Zhou, J., **Na, R.**, and Wu, B. (2024). Experimental Study on Infrared Detection of Debonding in Concrete-filled Steel Tubular Structure under Acceleratory Period of Hydration Heat Action. *Case Studies in Construction Materials*, e03928.

Cai, H., Cheng, C., **Na, R.**, Zhang, H., Zhou, J., Jing, S. and Miao, C. (2024) “Cooling-Excited Infrared Thermography for Enhancing the Detection of Concrete Filled Steel Tube Interfacial Debonding”, *Case Studies in Construction Materials*, 20, p.e02995

Aljagoub, D., **Na, R.** (2022) “Performance Evaluation of Uncooled UAV Infrared Camera in Detecting Concrete Delamination”, *Infrastructures*, Vol. 7, No. 12, pp. 163

Na, R., and Shen, Z. (2021) “Assessing Cooling Energy Reduction Potentials by Retrofitting Traditional Cavity Walls into Passively Ventilated Cavity Walls”, *Building Simulation*, Vol. 14, No. 4, pp. 1295-1309

Shen, Z., Cheng, C., **Na, R.**, & Shang, Z. (2020). “To Automate Detecting, Quantifying and Mapping of Delamination via Arial Thermography”, Nebraska Department of Transportation

Cheng, C., **Na, R.**, and Shen, Z. (2019) “Thermographic Laplacian-Pyramid Filtering to Enhance Delamination Detection in Concrete Structure”, *Journal of Infrared Physics and Technologies*, 97, 162-176.

Na, R., Lin, S., Shen, Z., and Gu, L. (2016). "Case Study of Quantifying Energy Loss through Ceiling-Attic Recessed Lighting Fixtures through 3D Numerical Simulation." *Journal of Architecture. Engineering*, 23(1), C5016003.

Conference Publications/Presentations

Aljagoub, D., Ahlborn, A., **Na, R.**, and Zhao, T. (Accepted). “Streamlining Bridge Maintenance and Monitoring by Employing Augmented Reality (AR)”, *Associated Schools of Construction-Annual International Conference Proceedings*, April 22-24, 2025, Calgary, Alberta, Canada

Zhao, T. and **Na, R.** (2024). “Evaluating the Effectiveness of Augmented Reality (AR) in Interior Design Courses”, *Associated Schools of Construction-Annual International Conference Proceedings*, April 3-5, 2024, Auburn, Alabama

Ahlborn, A., Aljagoub, D., and **Na, R.** (2024). “Streamlining Bridge Delamination Defect Maintenance Employing Real-Time Augmented Reality”, *Associated Schools of Construction-Annual International Conference Proceedings*, April 3-5, 2024, Auburn, Alabama

Aljagoub, D., and **Na, R.** (2023). “Evaluating the Effectiveness of Building Information Modeling (BIM) and Virtual Reality (VR) in Understanding Mechanical, Electrical, and Plumbing (MEP) Blueprints”, *Associated Schools of Construction-Annual International Conference Proceedings*, April 3-6, 2023, Liverpool, United Kingdom

Na, R., Webber, R. and Aljagoub, D. (2022). “Case-Study: Effectiveness of BIM as a Tool to Aid in Transportation Blueprint Reading for Young AEC Professionals”, The Transportation Asset and Infrastructure Management (TAIM) Conference, Oct 16-17, 2022. Boalsburg, PA.

Na, R., Aljagoub, D., and Webber, R. (2022). “Integrating Virtual Reality (VR) into Construction Engineering and Management (CEM) Courses-A Case Study”, *Associated Schools of Construction-Annual International Conference Proceedings*, April 20-23, 2022, Atlanta, GA

Na, R. and Webber, R. (2022). “Transportation Blueprint Reading with BIM-A Transportation Construction Workforce Training Pilot”, Transportation Research Board Annual Meeting, Jan 9-13, 2022. Washington D.C.

Na, R., Shang, Z., Shen, Z. (2016). “Time-lapse of Cavity Brick Wall Temperature Profiles Using Infrared Thermography”. *Associated Schools of Construction-Annual International Conference Proceedings*, April 13-16, 2016, Salt Lake City, UT

Na, R., Lin, S., Shen, Z., Gu, L. (2014). “Evaluating Energy Loss through Recessed Lighting Fixtures (RLF) in Residential Buildings through a Case Study”. *Computing in Civil and Building Engineering*, June 23-25, Orlando, FL

Na, R., Lin, S., Shen, Z., Gu, L. (2013). “Impact of Air Leakage through Recessed Lighting Fixtures on the Energy Performance of Residential Buildings-A Case Study”. *The 3rd International Conference Central Europe towards Sustainable Building (CESB13)*, June 26 – 28, Prague, Czech Republic.

Funded Research Grants

PI, “Workforce Development and Job Training Pilot”, CIAMTIS, USDOT Region 3, 2021-2022, \$77,255.81

PI, “Infrared NDE Sensing of Delamination and Deterioration of Concrete Bridge Decks Using Consumer-grade UAV and Infrared Sensor”, University of Delaware Davis TA grant, 2020-2022, a thirty-month stipend of \$70,000 plus a full-tuition scholarship.

Co-PI, “To Automate Detecting, Quantifying and Mapping of Delamination of Bridge Decks using Aerial Thermographic NDE”, Nebraska Department of Transportation (NDOT), 2019-2020, \$ 109,844

Graduate Students Advised

Current Students:

Ph.D Student:

Dyala Aljagoub, Ph.D. Candidate in Civil Infrastructure Systems
Department of Civil and Environmental Engineering, University of Delaware
Dissertation Topic: *Deep Learning-Based UAV Thermography for Automatic Delamination Segmentation in Bridge Decks*
Expected Completion: May 2025

Graduated Master Students:

Andrew Ahlborn, MCE in Civil Infrastructure Systems
Department of Civil and Environmental Engineering, University of Delaware
Project Topic: *Streamlining Bridge Delamination Defect Maintenance Employing Real-Time Augmented Reality*
Graduated: December 2024
Current status: VDC Engineer, Whiting-Turner

Dyala Aljagoub, MCE in Civil Infrastructure Systems
Department of Civil and Environmental Engineering, University of Delaware
Thesis Topic: *Detecting Concrete Bridge Deck Delamination Using a Consumer-grade Unmanned Aerial Vehicle (UAV) and Infrared Sensor*
Graduated: December 2022
Current status: UD Civil Infrastructure Ph.D. student

Ryan Webber, MCE in Civil Infrastructure Systems
Department of Civil and Environmental Engineering, University of Delaware
Thesis Topic: *Teaching Transportation Construction Blueprint Reading with BIM Support*
Graduated: August 2022
Current status: Assistant Project Manager, Cushman and Wakefield PLC

Graduate Students Advised as A Committee Member

Salah Dabash, Ph.D. in Civil Infrastructure Systems
Dissertation: *Applications of Computer Vision to Improve Construction Site Safety and Monitoring*
Graduated: December 2022
Current status: Associate Project Manager at Jones Lang LaSalle (JLL) Commercial Real Estate/Property Investment

Basel Elkhapery, Ph.D. in Civil Infrastructure Systems

Dissertation: *Sequencing Automated Multi-agent Wall Construction - UAV Case Scenario*

Graduated: May 2023

Current status:

Assistant Professor at American University in Dubai (AUD) 2024-present

Assistant Professor at Milwaukee School of Engineering (MSOE) 2023-2024

Undergraduate Research Assistants Advised

Sean Friday (2019), Vinnie Green (2019), Jan Ziemecki (2020), Harrison Coutts (2020), Nate Hubbs (2020), Ryan Webber (2020-2021), Emily Christopher (2021), Andrew Ahlborn (2022-2023), Eliza Stauffer (2022), Adam Getty (2022), Lindsay Putnam (2022), David Fechtman (2023), Matthew Kinzel (2023-2024), Natalie Botto (2024), Emily Fasig (2025), William Manns (2025) and Laney Mitchell (2025)

Editorial Roles

Guest Editor, *Journal of Built Environment*, special issue: NDE for Civil Infrastructure, 2022-present

Editorial Board Member, *Journal of Sustainable Marine Structures*, 2019-present

Editorial Board Member, *Journal of Construction Research*, 2019-present

Peer Reviewer

Journal of Sustainability, 2024-present

Journal of Applied Sciences, 2023-present

Bridge Engineering Reports, 2023-present

TRB AKT50 Paper Reviews, 2023-present

Journal of Civil Engineering Education, 2023-present

Center for Integrated Asset Management for Multimodal Transportation Infrastructure Systems (CIAMTIS) grant proposal, 2021-present

Journal of Infrastructure Systems, 2021-present

Journal of Civil Engineering and Architecture, 2021-present

The ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, 2020-present

ASCE Annual Conference, 2019-present

Construction Research Congress, 2019-present

Associated School of Construction Annual International Conference, 2018-present

Academic Services

Member, Search Committee of CEM Program Director and Assistant Professor Positions, 2022-2023

Member, UD CEE Department Showcase and Recruiting Committee, 2022-present

Coach, Associated School of Construction (ASC) Region 1 Competition, 2022-present

Adviser, UD CEM Student Club, Construction Engineers of America (CEA), 2022-present

Lab Manager, UD BIM Cave, 2020-present

Adviser of UD CEM Juniors and Seniors, 2019-present
Member, UD's Faculty Senate International Studies Committee, 2019-present
Member, UD's CEE Chair Search Committee, 2019
Member, Search Committee of CEM Program Visiting Professor, 2019
Member, UD CEM Curriculum/ABET Review Committee, 2018-present

Community Service

School Board Member, The Friends of New Castle County School, 2022-2023
Volunteer Afterschool Mandarin Chinese Tutor, Linden Hill Elementary School, Red Clay School District, Delaware, 2021-2022

Professional Memberships

American Society of Civil Engineers (ASCE), 2019-Present
Associated Schools of Construction (ASC), 2018-Present
U.S. Green Building Council (USGBC) 2015-Present
Transportation Research Board (TRB) Friend of Committees on Workforce Development and Organizational Excellence, Concrete Pavement Construction and Rehabilitation, Concrete Bridges, Construction of Bridges and Structures

Awards/Certificates

ASCE Mini- ExCEEEd Fellow, 2018
Autodesk Revit Architecture Certified Professional, 2017
Sigma Lambda Chi, the International Construction Scholastic Honorary for Construction Engineering and Management students and faculty, 2017
Associated Schools of Construction Annual Conference Travel Grant, 2016
LEED Green Associate, 2015
Certificate of National Construction Cost Estimator, 2009

Selected Professional Training Attended

Associated Schools of Construction (ASC) Estimating Boot Camp, June 20-22, 2023, Milwaukee, WI
UD Summer Institute on Teaching, Newark, Delaware, June 1st, 2023
UD Faculty Achievement Program (UDFAP), in Newark, Delaware, 2021
Delivering Learning Experiences Online (DLEO), in Newark, Delaware, 2020
Autodesk University (AU) Expo and Workshops, in Las Vegas, Nevada, 2019
MINI-ExCEEEd Workshop, in Newark, Delaware, 2018
NSF Fall Grants Conference, in New Orleans, Louisiana, 2018