

Byungjoo Choi, Ph.D.

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| CONTACT INFORMATION | 711 Sanhakwon Department of Architectural Engineering Ajou University Suwon-si, Gyeonggi-do, 16499, Republic of Korea | Office: +82 (031) 219-2494 Fax: +82 (031) 219-2945 E-mail: bchoi@ajou.ac.kr http://www.smartconstructionlab.com |
| RESEARCH INTERESTS | <ul style="list-style-type: none">• Smart construction (Artificial Intelligence, Big Data, Sensing Technologies, VR/AR, etc.)• Organizational studies in construction projects• Off-site construction & Modular Integrated Construction• Construction safety• Smart building system and technologies | |
| EDUCATION | University of Michigan, Ann Arbor, MI, USA <i>Doctoral of Philosophy, Civil Engineering (Construction Management)</i> Apr. 2018 <ul style="list-style-type: none">• Dissertation: The Role of Socio-Cognitive Process in Construction Workers' Safety Behavior• Dissertation Committee: Dr. SangHyun Lee (Advisor/Chair), Dr. Vineet R. Kamat, Dr. Carol C. Menassa (Dept. of Civil and Environmental Engineering (CEE)), and Dr. Richard P. Bagozzi (Stephen M. Ross School of Business) <i>Certificate of Graduate Studies, Complex Systems</i> Dec. 2017 Seoul National University, Seoul, Korea <i>Master of Science, Architectural Engineering (Construction Management)</i> Feb. 2014 <ul style="list-style-type: none">• Thesis: 4D BIM-Based Workspace Planning Process for Building Construction• Advisor: Dr. Hyun-Soo Lee <i>Bachelor of Science, Architecture</i> Feb. 2007 <ul style="list-style-type: none">• Minor: Business Administration | |
| ACADEMIC AND PROFESSIONAL EXPERIENCE | Ajou University, Suwon, Gyeonggi-do, Korea <i>Associate Professor, Department of Architect and Architectural Engineering</i> 2023 – present <i>Assistant Professor, Department of Architect and Architectural Engineering</i> 2019 – 2023 Southern Illinois University, Edwardsville, IL, USA <i>Assistant Professor, Department of Construction</i> 2018 – 2019 University of Michigan, Ann Arbor, MI, USA <i>Post-doctoral Research Associate, Dynamic Project Management Group</i> 2018 – 2018 <i>Graduate Student Research Assistant, Department of CEE</i> 2014 – 2018 <i>Graduate Students Instructor, Department of CEE</i> 2016 – 2017 Seoul National University, Seoul, Korea <i>Graduate Research Assistant, Department of Architectural Engineering</i> 2012 – 2014 DL Engineering & Construction, Co., Ltd., Seoul, Korea <i>Assistant Manager, Green-Bio Research Complex Construction Project</i> 2011 – 2012 <i>Field Engineer, Dealim International House Construction Project</i> 2009 – 2010 <i>Field Engineer, Garden 5 tools Building Construction Project</i> 2007 – 2008 | |

Hyundai Engineering & Construction Co., Ltd., Seoul, Korea
Summer Intern 2006 – 2006

Republic of Korea Army, Seoul, Korea
Military Service, Infantry 2002 – 2004

TEACHING AT
AJOU UNIVERSITY

SARC 854 “Construction Operation System Simulation” Spring, 2019–present
Fundamentals of computer simulations in construction engineering and management. Topics include Monte-Carlo simulation, Discrete Event Simulation, System Dynamics, and Agent-Based Modeling

SARC 504 “Machine Learning Basics” Fall, 2021–present
Theoretical understanding and practical applications of various machine learning methods including linear model, decision trees, ensemble methods, kernel methods, support vector machine, clustering, etc. in Architecture, Engineering, and Construction

SARC 502 “Engineering Data Analysis” Fall, 2019–present
Advanced statistical analysis methods for graduate students including multiple linear regression, logistic linear regression, multi-level modeling, and structural equation modeling

ARE 496 “Simulations in AEC” Spring, 2021–present
Understanding of smart construction technologies adopted in practice. Topic includes Building Information Model (BIM) applications for construction management, Laser scanning, Photogrammetry, etc.

ARCH 491 “Architectural Engineering Integrated Design Practice” Spring, 2019–present
Capstone Design Course in Architectural Engineering. Students are provided with an opportunity to integrate and apply their knowledge acquired so far to solve a specific engineering problem.

ARCH 470 “Building Cost Management” Spring, 2019–present
Fundamentals of construction estimating and bidding process for construction engineer, Topics include quantity takeoff, unit cost pricing, bidding, conceptual cost estimating, etc.

ARCH 373 “Construction Management Practice” Fall, 2019–present
Fundamentals and applications of construction schedule management. The topics include Work Breakdown Structure, Network Scheduling, Resource Levelling, Schedule Monitoring and Control, etc.

ARCH 372 “Building Construction Practice” Fall, 2021–present
Fundamentals of building construction practice. Students learn how to develop construction plans for reinforcement concrete work and waterproof work using a real construction project.

CMAT 107 “Statistical Research & Analysis” Fall, 2019–present
Fundamentals of statistical analysis required for engineering students. Topics include: basic concepts of probability, sampling distributions, confidence intervals, statistical inference, regression analysis.

TEACHING AT
SOUTHERN ILLINOIS
UNIVERSITY

CNST 451 “Estimating and Bidding” Fall, 2018
Fundamentals of construction estimating and bidding process. Topics include quantity takeoff, unit cost pricing, bidding, conceptual cost estimating, etc.

CNST 341 “Plans and Specifications” Fall, 2018
 Introduction to plans and specification in construction projects for pre-construction and construction phases of projects.

TEACHING AT
 UNIVERSITY OF
 MICHIGAN

Coursera Construction Engineering and Management MasterTrack 2018
Course Advocate (Instructor: Dr. SangHyun Lee)
 • Course 1: Construction Project Planning, Scheduling, and Control
 • Course 2: Construction Safety and Human Factors

CEE 532 “Construction Project Engineering” Fall, 2017
Guest Lecturer (Instructor: Dr. SangHyun Lee)
 • Systems thinking, System Dynamics (SD) modeling and simulation, and dynamic relationships of productivity, quality and rework (2 weeks session)

CEE 431 “Construction Contracting” Fall, 2016 – Winter, 2017
Graduate Student Instructor (Instructor: Dr. Rasha Stino)
 • Unit cost estimating, scheduling, and lump sum bidding proposal preparation

Undergraduate Research Opportunity Program Fall, 2016 – Fall, 2017
Graduate Student Research Mentor (Instructor: Dr. SangHyun Lee)
 • Mentee: Linwei Zhang and Logan Suarez Parmer (Undergraduate Engineering Student)

HONORS AND
 AWARDS

Outstanding Research Faculty Award, Ajou University 2024
Outstanding Research Award, Ajou University 2024
Best Paper Award, Supervisor, KICEM Annual Conference 2023
Outstanding Paper Award, KICEM Annual Conference 2023
Outstanding Research Faculty Award, Ajou University 2023
Outstanding Reviewer, Journal of Construction Engineering and Management 2023
Outstanding Research Award, Ajou University 2023
Best Paper Award, 22nd International Conference on Construction Applications of Virtual Reality (CONVR2022) 2022
Outstanding Paper Award, KICEM Annual Conference 2022
Outstanding Research Faculty Award, Ajou University 2022
Best Lecture Award, Ajou University 2022
Outstanding Paper Award, KICEM Annual Conference 2021
Outstanding Research Award, Supervisor, KICEM Annual Conference 2021
Outstanding Reviewer, Journal of Construction Engineering and Management 2020
Merit Paper Award, Supervisor, KICEM Annual Conference 2020
Outstanding Research Faculty Award, Ajou University 2020
Outstanding Research Award, Ajou University 2020
Outstanding Reviewer, Journal of Construction Engineering and Management 2018
CEE Departmental Nomination for the ProQuest Distinguished Dissertation Award,

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| University of Michigan | 2018 |
| The Richard and Eleanor Towner Prize for Distinguished Academic Achievement , University of Michigan | 2018 |
| CEE Departmental Nomination for the Richard and Eleanor Towner Prize for Outstanding PhD Research , University of Michigan | 2017 |
| Rackham Predoctoral Fellowship , University of Michigan | 2017 |
| <ul style="list-style-type: none"> This is a prestigious university-wide fellowship that “supports outstanding doctoral students who are actively working on dissertation research that is unusually creative, ambitious and risk-taking.” It provides tuition, stipend, and benefits for one year. | |
| 2nd award in Engineering Graduate Research Symposium , University of Michigan | 2016 |
| The Honor Society of Phi Kappa Phi , University of Michigan Chapter | 2016 |
| Tau Beta Phi, The Engineering Honor Society , Michigan Gamma Chapter | 2015 |
| Chi Epsilon, The Civil Engineering Honor Society , University of Michigan Chapter | 2015 |
| Academic Poster Session Finalist , Construction Industry Institute Annual Conference | 2015 |
| John L. Tishman Fellowship , University of Michigan | 2014 |
| <ul style="list-style-type: none"> This is a prestigious inter-departmental fellowship that provides tuition, stipend, and benefits for promising first-year students. | |
| Merit Scholarship , Seoul National University | 2012–2013 |
| 1st award in the Parsons Brinkerhoff’s CM Competition , Parsons Brinkerhoff Korea | 2012 |
| Merit Scholarship , Seoul National University | 2005–2006 |

BOOKS & BOOK
CHAPTERS

[B2] **Choi, B.** 2021. “Factory Production of Modular Construction” *Introduction to Modular Construction* , Goomiseokuan (in Korean)

[B1] **Choi, B.**, Seo, J. O., and Kim, E. 2020. “Construction Project Management” *Construction Management* , Goomiseokuan (in Korean)

REFEREED
JOURNAL PAPERS
(INTERNATIONAL)

(* my graduate student advisees, ** my undergraduate student advisee, ***my post-doctoral fellow advisee)

[J35] Jeong, D., Kim, K., Hwang, S., Ryu, J., and **Choi, B.** (2024) ”Assessing the Efficiency of Specialty Contractors in the Construction Industry Using DEA and Tobit Regression”, *Alexandria Engineering Journal*, (in review, Corresponding author)

[J34] Kim, H., Lee, G., Ahn, H., and **Choi, B.** (2024) “Interpretable General Thermal Comfort Model based on Physiological Data from Wearable Bio Sensors: Light Gradient Boosting Machine (LightGBM) and SHapley Additive exPlanations (SHAP)”, *Building and Environment* (in review, Corresponding author)

[J33] Hong, S., **Choi, B.**, Ham, Y., Jeon, J., and Kim, H. (2024) “Hyper-Scale Construction Dataset Synthesis through Stable Diffusion for Machine Learning Training”, *Automation in Construction* (in review)

[J32] Baek, F., Kim, D., Lee, G., **Choi, B.**, and Lee, S. (2024) “Effect of Human Emotional Responses on Human-Robot Team Productivity in Construction”, *Automation in Construction* (in review) (**Invited Paper from article at the International Conference on Construction Applications of Virtual Reality 2022**)

- [J31] Saffari, S. F., Kim, D., and **Choi, B.** (2024) “Robotization of Miniature-Scale Radio-Controlled Excavator: A New Medium for DNN Data Preparation and Real Reinforcement Learning”, *IEEE Access* (in review)
- [J30] Seo, W., **Choi, B.**, and Kim, J. (2024) “Machine Learning Algorithm for the Recognition of Spaces in Architectural Plans”, *Building Research & Information* (in review)
- [J29] Bae, J., **Choi, B.**, Krupka, E., and Lee, S. (2024) “Harnessing Project Identity and Safety Norms to Promote Safety Behavior Among Workers: A Field Intervention Study”, *Journal of Construction Engineering and Management* (in review)
- [J28] *Baek, J., Kim, D., and **Choi, B.** (2024) “Deep learning-based automated productivity monitoring for on-site module installation in off-site construction”, *Developments in the Built Environment* Vol. 18, 100382 (Corresponding author)
- [J27] *Moon, S., Kim, S., and **Choi, B.** (2024) “Comparative feasibility study of physiological signals from wristband-type wearable sensors to assess occupants’ thermal comfort”, *Energy and Buildings*, Vol. 308, 114032 (Corresponding author)
- [J26] Kim, Y., Ahn, S., **Choi, B.**, Choi, M., and Hwang, S. (2023) “Enhancing pedestrian perceived safety through walking environment modification considering traffic and walking infrastructure” *Frontiers in Public Health*, Vol 11-2023, 1326468
- [J25] *Choo, H., Lee, B., Kim, H., and **Choi, B.** (2023) “Automated detection of construction work at heights and deployment of safety hooks using IMU with a barometer” *Automation in Construction*, Vol 147, 104714 (Corresponding author)
- [J24] Seo, W., **Choi, B.**, Shin, D., and Kim, J. (2023) ”Development of a quality management system for precast concrete factories”, *Journal of Civil Engineering and Management*, Vol. 29, No. 5, 475–486
- [J23] *Choo, H., Lee, B., Kim, J., and **Choi, B.** (2023) “Discovering pathways to the improve maintainability of multifamily residential building remodeling projects: importance applicability analysis” *Sustainable Cities and Society*, Vol 89 (2023), 104335 (Corresponding author)
- [J22] *Shin, J. and **Choi, B.** (2022) “Design and Implementation of Quality Information Management System for Modular Construction Factory” *Buildings*, Vol. 12, No. 5, 654 (Corresponding author)
- [J21] ***Yoon, J., Kim, K., and **Choi, B.** (2022) “Integrated framework for quantifying and applying nonworking days to planning and scheduling for determining reasonable construction time”, *Journal of Management in Engineering* Vol. 34, No. 2, 04022023 (Corresponding author)
- [J20] **Choi, B.** and Lee, S. (2022) “The psychological mechanism of construction workers’ safety participation: The social identity theory perspective” *Journal of Safety Research*, Vol. 82, 194–206
- [J19] *Shin, J., *Moon, S., Cho, B. H., Hwang, Sand **Choi, B.** (2022) ”Extended technology acceptance model to explain the mechanism of modular construction adoption” *Journal of Cleaner Production* Vol. 342, 130963 (Corresponding author)
- [J18] Lee, M., Hwang, S., Park, Y., and **Choi, B.** (2021) “Factors affecting bike-sharing system demand by inferred trip purpose: Integration of clustering of travel patterns and geospatial data analysis” *International Journal of Sustainable Transportation* Vol. 126, No. 9, 847–860

- [J17] Lee, G., **Choi, B.**, Jebelli, H., and Lee, S. (2021) “Assessment of construction workers’ perceived risk using physiological data from wearable sensors: A machine learning approach” *Journal of Building Engineering* Vol. 42, 10284 (Corresponding author)
- [J16] Nam, S., ***Yoon, J., Kim, K., and **Choi, B.** (2020) ”Optimization of prefabricated components in housing modular construction” *Sustainability*, Vol. 12, No. 24, 10269 (Corresponding author)
- [J15] Lee, G., **Choi, B.**, Jebelli, H., Ahn, C., and Lee, S. (2020) “Noise Reference Signal–Based Denoising Method for EDA Collected by Multimodal Biosensor Wearable in the Field” *Journal of Computing in Civil Engineering*, Vol. 34, No 6, 04020044 (**Invited Paper from article at the 2019 ASCE International Workshop on Computing in Civil Engineering**)
- [J14] Lee, G., **Choi, B.**, Jebelli, H., Ahn, C., and Lee, S. (2020) “Wearable Biosensor and Hotspot Analysis-based Framework to Detect Stress Hotspots for Advancing Elderly’s Mobility” *Journal of Management in Engineering*, Vol. 36, No. 3, 04020010
- [J13] Lee, G., **Choi, B.**, Jebelli, H., Ahn, C., and Lee, S. (2020) “Wearable Biosensor and Collective Sensing-based Approach for Detecting the Elderly’s Environmental Barriers” *Journal of Computing in Civil Engineering*, Vol.34, No. 2, 04020002
- [J12] Jebelli, H., **Choi, B.**, and Lee, S. (2019) “Application of Wearable Biosensors to Construction Sites II: Assessing Workers’ Physical Demand” *Journal of Construction Engineering and Management*, Vol. 145, No. 11, 040180
- [J11] Jebelli, H., **Choi, B.**, and Lee, S. (2019) “Application of Wearable Biosensors to Construction Sites. I: Assessing Workers’ Stress” *Journal of Construction Engineering and Management*, Vol. 145, No. 12 040179
- [J10] Ahn, C., Lee, S., Sun, C., Jebelli, H., Yang, K., and **Choi, B.** (2019) “Wearable Sensing Technology Applications in Construction Safety and Health” *Journal of Construction Engineering and Management*, Vol. 145, No. 11, 03119007
- [J09] **Choi, B.**, Jebelli, H., and Lee, S. (2019) “Feasibility Analysis of Electrodermal Activity (EDA) Acquired from Wearable Sensors to Assess Construction Workers’ Perceived Risk” *Safety Science*, Vol. 115, 110
- [J08] Shen, W., **Choi, B.**, Tang, W., and Lee, S. (2018) “How to Improve Interface Management Behaviors in EPC Projects? : Roles of Formal Practices and Social Norms” *Journal of Management in Engineering*, Vol. 34, No. 6, 04018032
- [J07] Hwang, S., Jebelli, H., **Choi, B.**, Choi, M., and Lee, S. (2018) “Measuring Workers’ Emotional State during Construction Tasks Using Wearable EEG” *Journal of Construction Engineering and Management*, Vol. 144, No. 7, 04018050
- [J06] **Choi, B.** and Lee, S. (2018) “An Empirically Based Agent-Based Model of the Socio-Cognitive Process of Construction Workers’ Safety Behavior” *Journal of Construction Engineering and Management*, Vol. 144, No. 2, 04017102
- [J05] **Choi, B.**, Hwang, S., and Lee, S. (2017) “What Drives Construction Workers’ Acceptance of Wearable Technologies in the Workplace?: Indoor Localization and Wearable Health Devices for Occupational Safety and Health” *Automation in Construction*, Vol. 84, 31-41
- [J04] **Choi, B.**, Ahn, S., and Lee, S. (2017) “Construction Workers’ Group Norms and Personal

Standards Regarding Safety Behavior: Social Identity Theory Perspective” *Journal of Management in Engineering*, Vol. 33, No. 4, 04017001

[J03] **Choi, B.** and Lee, S. (2017) “Role of Social Norms and Social Identifications in Safety Behavior of Construction Workers. II: Group Analyses for the Effects of Cultural Backgrounds and Organizational Structures on Social Influence Process” *Journal of Construction Engineering and Management*, Vol. 143, No. 5, 04016125

[J02] **Choi, B.**, Ahn, S., and Lee, S. (2017) “Role of Social Norms and Social Identifications in Safety Behavior of Construction Workers. I: Theoretical Model of Safety Behavior under Social Influence” *Journal of Construction Engineering and Management*, Vol. 143, No. 5, 04016124

[J01] **Choi, B.**, Lee, H.S., Park, M., Cho, Y. K., and Kim, H. (2014) “Framework for Work-Space Planning Using Four-Dimensional BIM in Construction Projects” *Journal of Construction Engineering and Management*, Vol. 140, No. 9, 04014041

JOURNAL PAPERS
IN PREPARATION

[J38] Yoo, J., Kim, H., **Choi, B.** (2024) ”Feasibility of Wearable 360 Camera for Proximity Monitoring at Construction Sites”, *Automation in Construction*, (to be submitted August 2024, Corresponding author)

[J37] Choi, H., Lee, K., **Choi, B.** (2024) ”Development of As-Built Structural Model using Laser Scanning and Machine Learning”, *Sustainable Cities and Society*, (to be submitted August 2024, Corresponding author)

[J36] Ban, J., Kim, D., **Choi, B.** (2024) ”Feasibility of VR-based Synthetic Data to Automated Progress Monitoring of Off-Site Construction”, *Automation in Construction*, (to be submitted August 2024, Corresponding author)

REFEREED
JOURNAL PAPERS
(DOMESTIC)

[D04] **Choi, B.**, (2023) ”An agent-based model of the effects of group norms and project identification on construction workers’ safety behavior” *Journal of Construction and Robotics* Vol. 2, No. 3, pp. 1 - 8

[D03] Oh, J., Kim, H., **Choi, B.**, and Kim, S. (2022) ”Development of Energy Conservation Measures for Office Buildings by Analyzing Monthly Energy Use Patterns” *Journal of Architecture Institute of Korea* Vol. 38, No. 5, pp. 139 - 148

[D02] Kim, T., Park, S., **Choi, B.**, Kang, Y., Park K., Jeong, W., and Koo, C. (2022) “A Survey of Perception Differences Among University Students, Professors, and Practitioners on the Construction Technologies in the Fourth Industrial Revolution” *Korean Journal of Construction Engineering and Management*, Vol. 23, No. 3, pp. 095 - 103

[D01] **Choi, B.** Lee, H.S., Park, M., Kim, H., and Hwang, S. (2013) “4D BIM Based Workspace Planning Process in Building Construction Project.” *Korean Journal of Construction Engineering and Management*, Vol. 14, No. 5, pp. 175–187

REFEREED
CONFERENCE
PAPERS
(INTERNATIONAL)

(* my graduate student advisees, ** my undergraduate student advisee, ***my post-doctoral fellow advisee)

[C13] Park, F., Kim, D., Lee, G., **Choi, B.**, and Lee, S. (2022) ”Emotional Response Modeling for Human-Robot Collaboration in Construction” *22nd International Conference on Construction Applications of Virtual Reality (CONVR2022)*, Seoul, Korea, (**Best Paper Award**)

[C12] **Choi, B.** and Lee, S. (2021) “Impact of the Dynamicity of Workgroup Changes on Social

Influence of Construction Workers' Safety Behaviors" *International Conference on Computing in Civil Engineering*, Orlando, FL

[C11] **Choi, B.**, Lee, G., and Lee, S. (2019) "Assessing Workers' Perceived Risk During Construction Task Using A Wristband-Type Bio-Sensor" *Creative Construction Conference*, Budapest, Hungary

[C10] Lee, G., **Choi, B.**, Ahn, C., and Lee, S. (2019) "Feasibility of Wearable-Based Collective Sensing to Detect Environmental Barriers for Facilitating the Elderly's Mobility" *International Conference on Smart Infrastructure and Construction*, Cambridge, United Kingdom

[C09] Lee, G., **Choi, B.**, Jebelli, H., Ahn, C., and Lee, S. (2019) "Reference Signal based Method to Remove Respiration Noise in Electrodermal Activity (EDA) Collected from the Field" *International Workshop on Computing in Civil Engineering*, Atlanta, GA

[C08] Jebelli, H., Choi, B., Kim, H., and Lee, S. (2018) "Feasibility Study of a Wristband-type Wearable Sensor to Understand Construction Workers' Physical and Mental Status" *Construction Research Congress*, New Orleans, LA

[C07] Shen, W., **Choi, B.**, Lee, S., and Tang W. (2018) "Effects of Formal Practices and Teamwork on Interface Management Performance in Large-Scale Construction Projects" *Construction Research Congress*, New Orleans, LA

[C06] **Choi, B.** and Lee, S. (2017) "Impact of the Strictness and Cohesiveness of Management Feedback on Construction Workers' Safety Behavior – Agent-Based Modeling and Simulation" *International Conference on Simulation and Modeling Methodologies, Technologies and Applications*, Madrid, Spain

[C05] **Choi, B.** and Lee, S. (2017) "Modeling the Effect of a Socio-Psychological Process on Construction Workers' Safety Behavior" *International Workshop on Computing in Civil Engineering*, Seattle, WA

[C04] **Choi, B.** and Lee, S. (2016) "How Social Norms Influence Construction Workers' Safety Behavior: A Social Identity Perspective" *Construction Research Congress*, San Juan, Puerto Rico

[C03] **Choi, B.**, Ahn, S., and Lee, S. (2015) "Understanding Group Norms Influence and Social Identification Influence in on Construction Workers Safety Behavior" *12th International Organization, Technology, and Management in Construction Conference*, Primosten, Croatia

[C02] Ahn, S., **Choi, B.**, and Lee, S. (2013) "Investigation on Construction Workers' Social Norms and Managers' Desired Norms Regarding Absence: Preliminary Results from a Norm Elicitation Technique" *CSCE International Construction Specialty Conference*, Vancouver, Canada.

[C01] Kim, H., Park, M., Lee, H.S. and **Choi, B.** (2012) "Automated Information Retrieval for Hazard Identification in Construction Site" *International Workshop on Computing in Civil Engineering*, LA, CA.

REFEREED
CONFERENCE
PAPERS
(DOMESTIC)

[DC05] **Jeon, I. and **Choi, B.** (2023) "Role of Management Factors in Shaping Organizational Citizenship Behavior : The Mediating Effect of Project Identification" *Korean Institute of Construction Engineering and Management Annual Conference*, Sokcho, Korea (in Korean)

[DC04] **Ban, J., *Baek, J., Seo, J., and **Choi, B.** (2023) "Feasibility Analysis of Synthetic Data Generated by Virtual Reality for Computer Vision-Based Productivity Monitoring in Modular Construction" *Korean Institute of Construction Engineering and Management Annual Conference*, Sokcho, Korea (in Korean) (**Outstanding Paper Awards**)

[DC03] **Baek, J., **Lee, J., and **Choi, B.** (2022) "Computer Vision-based Automated Productivity Monitoring System of On-Site Module Installing Task" *Korean Institute of Construction Engineering and Management Annual Conference*, Seoul, Korea (in Korean) (**Outstanding Paper Awards**)

[DC02] *Choo, H. and **Choi, B.** (2021) "A Preliminary Study of Design Strategy Development for Improving the Maintainability of Remodeling of the Apartment Building Projects Using Importance-Applicability Analysis (IAA)" *Korean Institute of Construction Engineering and Management Annual Conference*, Gyeongju, Korea (in Korean) (**Outstanding Paper Awards**)

[DC01] **Choi, B.**, Lee, H.S., Park, M., and Hwang, S. (2012) "Analysis of Collaborative Relationship between Predecessors and Successors in Construction Project Using System Dynamics" *Korean Institute of Construction Engineering and Management Annual Conference*, Daegu, Korea (in Korean).

INVITED SEMINARS
AND WORKSHOPS

[S07] Baek, J., Jeon, I., and **Choi, B.** (2023) "Quantitative Analysis of Indirect Advantages of Off-Site Construction: A Focus on Schedule Compression and Safety Improvement in Modular Construction", Korean Society of Automation and Robotics in Construction (KSARC) 2023 Convention Conference, Sejong, Korea

[S06] **Choi, B.** (2020) "Wearable Technologies for Safety and Health Management in Construction Sites", Dankook University, YongIn, Korea

[S05] **Choi, B.** (2019) "A Machine Learning Model for Classification of Construction Workers' Risk Perception Using Wearable Bio Sensors" *KIBIM Annual Conference*, Korea Institute of Building Information Modeling (KIBIM), Seoul, Korea

[S04] **Choi, B.** (2019) "Wearable Technologies for Construction Safety and Health Management" *KICEM Forum*, Korea Institute of Construction Engineering and Management (KICEM), Seoul, Korea

[S03] **Choi, B.**, and Lee, S. (2017) "The Role of Socio-Cognitive Mechanism in Construction Workers' Safety Behavior" *Engineering Graduate Research Symposium*, University of Michigan, Ann Arbor, MI, U.S.

[S02] **Choi, B.**, and Lee, S. (2016) "Effects of Socio-Cognitive Process on Construction Workers' Unsafe Behavior" *Engineering Graduate Research Symposium*, University of Michigan, Ann Arbor, MI, U.S.

[S01] **Choi, B.**, and Lee, S. (2015) "Social Influence on Construction Workers' Safety Behavior: The Role of Social Norms and Social Identities" *Construction Industry Institute Annual Conference 2015*, CII, Boston, MA, U.S.

PATENT

[P03] Tower crane auxiliary system and its control method, Korean Intellectual Property Office (pending), Application No. 10-2023-0122403 2023

[P02] Apparatus and method for detecting defects in buildings based on machine learning, Korean Intellectual Property Office (pending), Application No. 10-2023-0122404 2023

[P01] System for detecting safety hook fastening based on wearable sensor for high altitude sk workers and method thereof, Korean Intellectual Property Office, No. 10-2669992 2024

SOFTWARE
APPLICATIONS

[A03] Structural Dimension Prediction Software for Building Structural Members, Korea Copyright Association No. C-2023-053987 2023

[A02] Web-based Modular Construction Quality Management System, Korea Copyright Association No. C-2021-043528 2021

[A01] Constructability analysis program for typical floor demolition and reinforced concrete work in residential building remodeling project, Korea Copyright Association No. C-2021-023853 2021

GRANT

Automated Job Hazard Analysis for Construction Projects Using Large Language Model (PI: KRW 20M)

Ajou Univeristy 2024-2025

Investigating Support Measures and Strategies Enhancing the Capability of the Owners in Seoul Construction Industry (Co-PI)

Seoul Housing & Communities Corporation 2024-2024

Analysis of Construction Safety Management Level Assessment Data for Predicting the Risk of Construction Accidents (PI: KRW 72M)

Korea Authority of Land & Infrastructure Safety 2024-2025

Immersive-Virtual-Reality-Based Construction Safety Training Focusing on Safety-Related Social Aspects (Co-PI)

Research Grants Council of Hong Kong 2023-2026

Quantification of non-cost factor of modular construction (PI: KRW 50M)

POSCO 2023-2023

Improvement of standard process to improve the asset management of LH (Researcher)

Korea Land and Housing Corporation 2023-2023

Automated Productivity Analysis Platform for Off-Site Construction using Artificial Intelligence (PI: KRW 15M)

Ajou Univeristy 2022-2024

Automated HVAC control system using wearable sensors and IoT sensors (PI: KRW 14.5M)

Ajou Univeristy 2022-2024

Development of the standard construction period for the postal office (Co-PI: KRW 50M)

Korea Post Procurement and Construction Center 2022-2022

Development of installation guidelines for Seoul Modular School Buildings (Researcher)

Seoul Metropolitan Office of Education 2022-2022

Ajou Primier 10 (Co-PI: KRW 240M)

Ajou University 2022-2024

Development of the ditigal safety watch system for deteriorated buildings in the regional area (Researcher)

Ministry of Land, Infrastructure, and Transport of Korea 2022-2025

Effects of built environments of office occupants' stress and satisfaction (PI: KRW 20M)

| | | |
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| | Ajou University | 2021–2023 |
| | Planning of the development of a guideline for school space design and management using modular construction (Researcher) | |
| | Korean Institute of Educational Facility Safety | 2021–2021 |
| | Remodelling Project Management of Centumcityvill Apartment Complex (Co-PI) | |
| | Gosan Urban Development Co. Ltd. | 2021–2023 |
| | Development of a special specification and technical guideline for modular construction projects (Co-PI) | |
| | Korea Land and Housing Corporation | 2020–2021 |
| | Productivity and economic improvement of smart factory technology based HSA400 /PosMAC applied modular building construction (Co-PI) | |
| | POSCO | 2020–2021 |
| | Development of low cost and high-efficiency technologies for vertical extension of residential buildings (Co-PI) | |
| | Ministry of Land, Infrastructure, and Transport of Korea | 2020–2022 |
| | Development of an innovative apartment housing production system based on off-site construction (Co-PI) | |
| | Ministry of Land, Infrastructure, and Transport of Korea | 2020–2023 |
| | Construction Risk Monitoring Platform Using Collective Sensing of Wearable Bio Sensors (PI: KRW 90M) | |
| | National Research Foundation of Korea | 2020–2022 |
| | Technical Development of Modular Construction in Mid-high-Rise Building and Higher Productivity (Co-PI) | |
| | Ministry of Land, Infrastructure, and Transport of Korea | 2020–2021 |
| | Development of Standard of Organization for Combined Cycle Power Plant Construction Project (Researcher) | |
| | East-West Power Co., Ltd | 2020–2020 |
| | Smart Construction Safety Management System (PI: KRW 60M) | |
| | Ajou University | 2019–2021 |
| MISCELLANEOUS SUPPORTS | Strategic plan for research excellence of the graduate school of the Department of Architecture , Ajou University, KRW 2M | 2021 |
| | Effect of Project Identification on Construction Workers’ Safety Participation , Ajou University, KRW 1M | 2020 |
| | Rackham Conference Travel Grant , University of Michigan, \$800 | 2017 |
| | Rackham Conference Travel Grant , University of Michigan, \$800 | 2015 |
| | Rackham Graduate Student Research Grant , University of Michigan, \$1,500 | 2015 |
| MOU | Research Collaboration Agreement | 2022–present |

Construction Vision Lab, University of Toronto, Canada

Research Collaboration Agreement 2022–present
Attentive Hub, University of Alberta, Canada

Research Collaboration Agreement 2022–present
Human-Centered Intelligent System Lab, West Virginia University, USA

Research Collaboration Agreement 2022–present
Ham Research Group, Texas A&M University, USA

Research Collaboration Agreement 2020–present
Human-Centered Construction IT Lab, Hong Kong Polytechnic University, China

CURRENT
STUDENTS

Graduate Students

Jongyeon Baek, MSc student, Ajou University 2023–present

- Automated progress monitoring of on-site assembly of modular and off-site construction

Sungwoo Moon, MSc student, Ajou University 2021–present

- Assessment of Building Occupants' Thermal Comfort Using Wearable Bio Sensors

Undergraduate Students

Jiyoon Ban, BS student, Ajou University 2022–present

- Automated Productivity Analysis of Off-Site Construction using Extended Reality

Hwangjung Choi, BS student, Ajou University 2022–present

- Prediction of Structural Dimensions of Old Buildings' Elements using Machine Learning

Ikhwan Jeon, BS student, Ajou University 2023–present

- Psychological mechanism of construction engineers' organizational citizenship behaviors

JaeHyun Yoo, BS student, Ajou University 2023–present

- TBP

PREVIOUS
STUDENTS

Graduate Students

Jiwoong Shin, MSc, Ajou University 2020–2022

- Extended Technology Acceptance Model to Explain the Mechanism of Modular Construction Adoption
- Current position: Shinsegae E&C

Heonsang Choo, MSc student, Ajou University 2020–2022

- Monitoring Construction Workers' Work at Height Using Wearable Sensors
- Current position: Ssangyong E&C

Post-doctoral fellow

Jongsik Yoon, Ph.D., Ajou University 2020–2020

- Methodology for Quantifying and Applying Nonworking Days for Determining Reasonable Construction Time
- Current position: Construction Engineers Policy Institute of Korea

Graduated Undergraduate Students

Jaesuk Lee, BS student, Ajou University 2021–2022

- Automated productivity monitoring of on-site module installation using computer vision
- Current position: Hyundai Engineering

| | |
|--|-----------|
| Homin Lee, BS student, Ajou University | 2020–2020 |
| <ul style="list-style-type: none"> • Identify Construction Workers' Work at Height Using Wearable Sensors • Current position: Daewoo Engineering and Construction | |
| Jinho Lee, BS student, Ajou University | 2020–2020 |
| <ul style="list-style-type: none"> • Identify Construction Workers' Work at Height Using Wearable Sensors • Current position: Korea Asset Management Cooperation (Kamco) | |
| Hyunwoo Joo, BS student, Ajou University | 2019–2019 |
| <ul style="list-style-type: none"> • The Role of Project Identification in Construction Workers' Safety Behaviors • Current position: Hwaseong Urban Corporation | |
| Woncheol Lee, BS student, Ajou University | 2019–2019 |
| <ul style="list-style-type: none"> • Understanding Building Occupants' Thermal Comfort Using Wearable Bio Sensors • Current position: Kolon Global | |

PH.D. / MS
THESIS
COMMITTEE
MEMBER

Ph.D. Dissertation Committee

| | |
|--|------|
| Jaesang Seo, PhD student at Architectural Engineering, Ajou University, Korea | 2023 |
| <ul style="list-style-type: none"> • Development of Energy Performance Prediction Model for Neighborhood Facilities | |
| Young-Hoon Son, PhD student at Architectural Engineering, Ajou University, Korea | 2023 |
| <ul style="list-style-type: none"> • A Study of Influencing Factors for Decision-Making on Construction Contract Types: Focused on DoD Construction Aquisitions with Firm Fixed Procea and Cost Reimbursable in FAR | |
| Daewoon Jeong, PhD student at Architectural Engineering, Ajou University, Korea | 2023 |
| <ul style="list-style-type: none"> • Determinants of Efficiency of Specialty Construction Companies Using DEA and Tobit Regression Models | |
| Jun Young Jang, PhD student at Architectural Design and Engineering, Incheon National University, Korea | 2022 |
| <ul style="list-style-type: none"> • Automated Logistic Planning System for Precast Concrete Projects | |
| Jongsik Yoon, PhD student at Architectural Engineering, Ajou University, Korea | 2020 |
| <ul style="list-style-type: none"> • Activity Duration Segmentation Method (ADSM) Based Typical Duration Scheduling System | |
| SungHoon Nam, PhD student at Architectural Engineering, Ajou University, Korea | 2019 |
| <ul style="list-style-type: none"> • A Decision Support Model for Factory Production Planning through Prefabricated Components in Modular Buildings | |

Master Thesis Committee

| | |
|---|------|
| Subin Bae, MS student at Architecture, Ajou University, Korea | 2023 |
| <ul style="list-style-type: none"> • BIM-based development system for automatically generating the assembly sequence of PC components using Genetic Algorithm | |
| Mijin Kim, MS student at Architecture, Ajou University, Korea | 2023 |
| <ul style="list-style-type: none"> • Anthropomorphic Soft-robot Hand: Application in multi-task human-robot collaborative architecture | |
| Mollaeiubli Takmasib, MS student at Architecture, Ajou University, Korea | 2023 |
| <ul style="list-style-type: none"> • Experimental Investigation of AI Model Performance for Daylight Control using XAI | |
| Daseul Park, MS student at Architectural Engineering, Ajou University, Korea | 2023 |
| <ul style="list-style-type: none"> • Defect Information Management Systems for Aparment Buildings using Mahcine Leaarning | |
| Hyeon-Ju Shin, MS student at Architectural Engineering, Ajou University, Korea | 2022 |
| <ul style="list-style-type: none"> • Proposal of smart construction quality management work process in construction phase and Development of BIM-based construction quality management system framework : Focused on | |

| | | |
|---|--|------|
| floor tile work | | |
| Dahee Kim, MS student at Architectural Engineering, Ajou University, Korea | | 2022 |
| • Integrated Fire Disaster Monitoring System using Building Information Modeling | | |
| Joonho Lee, MS student at Architectural Engineering, Ajou University, Korea | | 2022 |
| • Predictive model of Life Cycle Carbon Emission of Modular Buildings using Machine Learning | | |
| Hyungjoon Kim, MS student at Architectural Engineering, Ajou University, Korea | | 2022 |
| • Update the building usage profile to improve the energy consumption evaluation system | | |
| Hyeongmin Ryu, MS student at Architectural Engineering, Ajou University, Korea | | 2021 |
| • Automated structural evaluation of floor plans for remodelling of apartment housing | | |
| Meesung Lee, MS student at Architectural and Urban System Engineering, Ewha Womans University, Korea | | 2019 |
| • Study on the Factors Affecting Usage Intention of the Bike-sharing System through Users' Travel Patterns and Geospatial Data Analysis | | |
| Honggeon Park, MS student at Architectural Engineering, Ajou University, Korea | | 2019 |
| • Effect of Working Hour Reduction on Construction Project Schedule | | |
| Wonkyung Koh, MS student at Architectural Engineering, Ajou University, Korea | | 2019 |
| • Development of a Feasibility Evaluation Model for Old Apartment Remodeling with the Number of Household Increasing at the Preliminary Stage | | |
| SooHyun Jung, MS student at Architectural Engineering, Ajou University, Korea | | 2019 |
| • Development of 3D BIM based Building Fire Information Management System Prototype for Object Data Visualization | | |

PROFESSIONAL
LEADERSHIP
AND SERVICE
ACTIVITIES

| | | |
|---|--|--------------|
| Vice Chair , Industry-Government-Academic Cooperation Committee, AIK | | 2024–present |
| Member , Technical Advisory Committee for Public Development Projects, KAMCO | | 2024–present |
| Vice Chair , International Exchange Committee, KICEM | | 2024–present |
| Vice Chair , Quality Management Committee, KICEM | | 2024–present |
| Member , Board of Directors, Korea Institute of Construction Safety | | 2024–present |
| Member , Board of Directors, Korea Institute of Remodeling Convergence | | 2023–present |
| Member , Construction Technical Review Committee, YongIn Special City | | 2023–present |
| Member , Technical Advisory and Review Committee for Power Building Design and Construction, KEPCO | | 2023–present |
| Member , Research and Development Committee, KICEM | | 2022–present |
| Member , Project Development Committee, Korea Railroad Corporation | | 2022–present |
| Member , Apartment Remodeling Advisory Board, Seongnam City | | 2022–present |
| Member , Technical Advisory Council, Public Procurement of Korea | | 2021–present |
| Member , Advisory Council, Construction Engineer Policy Institute of Korea | | 2021–present |
| Member , Research Advisory Council, Seoul Institute of Technology | | 2020–present |
| Secretary , Industry Development Committee, KICEM | | 2020–2021 |
| Member , 4th Industrial Revolution Construction TF Committee, KICEM | | 2020–2021 |
| Member , Magazine Publication Committee, KICEM | | 2020–2021 |
| Member , Architectural Institute of Korea (AIK) | | 2020–present |

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|------------------------------------|---|--------------|
| | Member , ASCE Technical Council on Computing and Information Technology (TCCIT) Visualization, Information Modeling, and Simulation (VIMS) Committee | 2017–present |
| | Member , ASCE Technical Council on Computing and Information Technology (TCCIT) Data Sensing and Analysis (DSA) Committee | 2017–present |
| | Member , American Society of Civil Engineers (ASCE) | 2017–present |
| | Member , Korea Institute of Construction Engineering and Management (KICEM) | 2013–present |
| CONFERENCE ORGANIZATION ACTIVITIES | Technical Committee , 10th International Conference on Construction Engineering and Project Management (ICCEPM 2024), Sapporo, Japan | 2024 |
| | Organizing Committee , Building Smart Conference, buildingSMART Korea, Seoul, Korea | 2023 |
| | Track Chair , Korean Institute of Construction Engineering and Management Annual Conference (Off-Site Construction Track), Seoul, Korea | 2022 |
| | Scientific Committee , International Conference on Construction Applications of Virtual Reality (CONVR 2022), Seoul, Korea | 2022 |
| | Organizing Committee , Building Smart Forum, buildingSMART Korea, Seoul, Korea | 2022 |
| | Track Chair , Korean Institute of Construction Engineering and Management Annual Conference (Construction Innovation Track), Gyungju, Korea | 2021 |
| | Track Chair , Korean Institute of Construction Engineering and Management Annual Conference (Smart Construction Track), Suwon, Korea | 2020 |
| | Track Chair , Korean Institute of Construction Engineering and Management Annual Conference (Track 4), Goyang, Korea | 2019 |
| EDITORSHIP | Topic Editor , Buildings | 2023–present |
| | Assistant Specialty Editor , “Organizational Issues” area in the Journal of Construction Engineering and Management | 2022–present |
| | Guest Editor , Special Issue on “Sustainable Construction Management and Computer Simulation” Sustainability | 2020 |
| | Topic Editor , International Journal of Environmental Research and Public Health | 2020–2023 |
| PAPER AND PROPOSAL GRANT REVIEW | Reviewer , Developments in Built Environment, Elsevier | 2024–present |
| | Reviewer , Sustainable Cities and Society, Elsevier | 2023–present |
| | Reviewer , Journal of Occupational Health, John Wiley & Sons | 2023–present |
| | Reviewer , Heliyon, Cell Press | 2022–present |
| | Reviewer , International Journal of Human-Computer Studies, Elsevier | 2022–present |
| | Reviewer , International Journal of Disaster Risk Reduction, Elsevier | 2022–present |
| | Reviewer , Safety Science, Elsevier | 2022–present |
| | Reviewer , Journal of Management in Engineering, ASCE | 2022–present |
| | Reviewer , Buildings, MDPI | 2022–present |
| | Reviewer , Cities, Elsevier | 2021–present |
| | Reviewer , Frontiers in Psychology, Frontiers | 2021–present |
| | Reviewer , Computers & Electrical Engineering, Elsevier | 2021–present |
| | Reviewer , Journal of Building Engineering, Elsevier | 2021–present |
| | Reviewer , Digital Signal Processing, Elsevier | 2021–present |

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| Reviewer , Intl' Journal of Environmental Research and Public Health, MDPI | 2021–present |
| Reviewer , Seoul Institute of Technology Grant | 2020–present |
| Reviewer , National Research Foundation of Korea Grant | 2020–present |
| Reviewer , Journal of Environmental Management, Elsevier | 2020–present |
| Reviewer , Safety and Health at Work, Elsevier | 2020–present |
| Reviewer , Sustainability, MDPI | 2020–present |
| Reviewer , Advanced Engineering Informatics, Elsevier | 2020–present |
| Reviewer , Advances in Civil Engineering, Hindawi | 2020–present |
| Reviewer , Applied Science, MDPI | 2019–present |
| Reviewer , Automation in Construction, Elsevier | 2019–present |
| Reviewer , KSCE Journal of Civil Engineering, Springer | 2019–present |
| Reviewer , Journal of KIBIM, Korea Institute of Building Information Modeling | 2019–present |
| Reviewer , Sensors, MDPI | 2019–present |
| Reviewer , Journal of Civil Engineering and Management, Techno Press | 2019–present |
| Reviewer , Advances in Computational Design, Techno Press | 2018–present |
| Reviewer , Journal of Computing in Civil Engineering, ASCE | 2018–present |
| Reviewer , Journal of Construction Engineering and Management, ASCE | 2017–present |
| Reviewer , Journal of Construction Engineering and Project Management, KICEM | 2016–present |

CONSULTING

University of Michigan, USA

- Technical consulting service on construction workers' emotional responses to robots at construction sites 2023

Cambridge Innovation Consulting, UK

- Technical consulting service on the new robotic and automation solutions in Japan, Korea, China and Singapore 2016

UNIVERSITY SERVICE

| | |
|--|--------------|
| Program Director , Micro Degree of AI in Architecture, Ajou Univeristy | 2024–present |
| Program Director , Architectural Engineering Program, Ajou Univeristy | 2023–present |
| Planning Committee , College of Engineering, Ajou Univeristy | 2023–present |
| Basic Science and Math Committee , Ajou Univeristy | 2021 |
| Scholarship Committee , School of Engineering, Southern Illinois University | 2018 |
| Computer Committee , School of Engineering, Southern Illinois University | 2018 |
| Safety Committee , School of Engineering, Southern Illinois University | 2018 |

REFERENCES

Available upon request