

# SEUNG HYUN CHA

Associate Professor (Sep 2021 – Present),  
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Adjunct Professor (Dec 2021 – Present),  
Department of Civil and Environmental Engineering, KAIST

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## Research interests

Future Cities, Virtual Architecture and Design, Data-driven Design, Human Behavior

## Academic qualifications

University of Cambridge  
PhD in Architecture  
Cambridge, UK  
November 2015

‘Dissertation title: Stochastic Space-use Prediction in light of Spatial Choice Behaviour:  
Modelling Space Preference of Work-related Activities’

Stanford University  
MS in Sustainable Design and Construction  
Stanford, CA  
June 2011

Korea University  
BEng in Architectural Engineering  
Seoul, Korea  
August 2009

## Research and academic experience

Hanyang University, Department of Interior Architecture Design, Assistant Professor  
(September 2018 – August 2021), Seoul

The Hong Kong Polytechnic University, Department of Building Services Engineering,  
Assistant Professor (November 2015 – August 2018) Hong Kong

Nanyang Technological University, Nanyang Centre for Underground Space,  
Research Associate (March 2015 – July 2015) Singapore

City University of Hong Kong, Department of Architecture and Civil Engineering,  
Graduate teaching assistant (December 2013 – August 2014) Hong Kong

Stanford University, P5BL Lab, Department of Civil and Environmental Engineering,  
Research assistant (September 2010 - January 2011) Stanford, CA

## Refereed journals

<international>

- Lee, J., Ma, J., Seo, J., and Cha, S. (Corresponding author), "Review of Applications and User Perceptions of Smart Home Technology for Health and Environmental Monitoring," *Journal of Computational Design and Engineering*, Oxford University Press, 9(3), 857-889, 2022 [SCIE, Q1, 9.44%].
- Ma, J., Lee, J. and Cha, S. (Corresponding author), "Effects of lighting CCT and illuminance on visual perception and task performance in immersive virtual environments," *Building and Environment*, Elsevier, 209, 108678, 2022 [SCIE, Q1, 4.01%]
- Gassar, A., and Cha, S. (Corresponding author), "Feasibility assessment of adopting distributed solar photovoltaics and phase change materials in multifamily residential buildings," *Sustainable Production and Consumption*, Elsevier, 29, 507-528, 2022 [SSCI, Q1, 23.6%].
- Jo, T., Ma, J. and Cha, S. (Corresponding author), "Elderly Perception on the Internet of things-based Integrated Smart-Home System," *Sensors*, MDPI, 21(4), 1284, 2021 [SCIE, Q1, 21.09%].
- Gassar, A., and Cha, S. (Corresponding author), "Review of geographic information systems-based roof solar photovoltaic potential estimation approaches at urban scales," *Applied Energy*, Elsevier, 291, 116817, 2021 [SCIE, Q1, 3.85%].
- Ma, J. and Cha, S. (Corresponding author), "A user-specific activity pattern generation framework for evidence-based ABW planning," *Building and Environment*, Elsevier, 189, 107519, 2021 [SCIE, Q1, 4.01%]
- Jang, J., Ahn, J., Cha, S., Cho, K., Koo, C. and Kim, T., "Towards Productivity in Future Construction: Mapping Knowledge and Finding Insights for Achieving Successful Offsite Construction Projects," *Journal of Computational Design and Engineering*, Oxford University Press, 8(1), 1-14, 2021 [SCIE, Q1, 9.44%].
- Gassar, A., Koo, C., Kim, T. and Cha, S. (Corresponding author), "Performance Optimization Studies on Heating, Cooling and Lighting Energy Systems of Buildings during the Design Stage: A Review," *Sustainability*, MDPI, 13, 9815, 2021 [SCIE, Q2, 45.07%].
- Ma, J. and Cha, S. (Corresponding author), "A human data-driven interaction estimation using IoT sensors for workplace design," *Automation in Construction*, Elsevier, 119, 103352, 2020 [SCIE, Q1, 1.09%].
- Cha, S., Zhang, S., and Kim, T., "Effects of Interior Color Schemes on Emotion, Task Performance, and Heart Rate in Immersive Virtual Environments," *Journal of Interior Design*, Wiley, 45(4), 51-65, 2020 [A&HCI, Q1, 8.24%].
- Gassar, A., and Cha, S. (Corresponding author), "Energy prediction techniques for large-scale buildings towards a sustainable built environment: A review," *Energy and Buildings*, Elsevier, 224, 110238, 2020 [SCI, Q1, 6.2%].
- Li, W., Koo, C., Hong, T., Oh, J., Cha, S. and Wang, S., "A novel operation approach for the energy efficiency improvement of the HVAC system in office spaces through real-time big data analytics," *Renewable and Sustainable Energy Reviews*, Elsevier, 127, 109885, 2020 [SCIE, Q1, 1.14%].

- Cha, S. and Kim, T., "The role of space attributes in space-choice behaviour and satisfaction in an academic library," *Journal of Librarianship and Information Science*, Sage, 52(2), 399-409, 2020 [SSCI, Q3, 54.71%].
- Abbas, A., Choi, M., Seo, J., Cha, S., and Li, H., "Effectiveness of Immersive Virtual Reality-based Communication for Construction Projects," *KSCE Journal of Civil Engineering*, KSCE, 23(12), 4972-4983, 2019 [SCIE, Q3, 68.98%].
- Cha, S., Koo, C., Kim, T., and Hong, T., "Spatial perception of ceiling height and type variation in immersive virtual environments," *Building and Environment*, Elsevier, 163, 106285, 2019 [SCI, Q1, 4.01%].
- Kim, T. and Cha, S. (Corresponding author), "Empirical validation of the spatial-choice modeling approach to user simulation," *Architectural Science Review*, Taylor & Francis, 62(4), 313-322, 2019 [A&HCI, Q1, 0.55%].
- Chen, H., Cha, S., and Kim, T., "A framework for group activity detection and recognition using smartphone sensors and beacons," *Building and Environment*, Elsevier, 158, 205-216, 2019 [SCI, Q1, 4.01%].
- Zhang, S., Lu, L., Dong, C., and Cha, S., "Performance evaluation of a double-pipe heat exchanger fitted with self-rotating twisted tapes," *Applied Thermal Engineering*, Elsevier, 158, 113770, 2019 [SCIE, Q1, 9.17%].
- Baek, S., and Cha, S. (Corresponding author), "The trilateration-based BLE Beacon system for analyzing user-identified space usage of New Ways of Working offices," *Building and Environment*, Elsevier, 149, 264-274, 2019 [SCI, Q1, 4.01%].
- LI, W., Koo, C., Cha, S., Lai, H., and Lee, J., "A conceptual framework for the real-time monitoring and diagnostic system for the optimal operation of smart building: A case study in Hotel ICON of Hong Kong," *Energy Procedia*, Elsevier, 158, 3107-3112, 2019 [Scopus, Q1, 23.08%].
- Koo, C., Li, W., Cha, S. (Corresponding author), Zhang, S., "A novel estimation approach for the solar radiation potential with its complex spatial pattern via machine-learning techniques," *Renewable Energy*, Elsevier, 133, 575-592, 2019 [SCIE, Q1, 13.60%].
- Zhang, S., Lu, L., Dong, C., and Cha, S., "Thermal characteristics of perforated self-rotating twisted tapes in a double-pipe heat exchanger," *Applied Thermal Engineering*, Elsevier, 162, 114296, 2019 [SCIE, Q1, 9.17%].
- Li, W., Koo, C., Cha, S., Hong, T., and Oh, J., "A novel real-time method for HVAC system operation to improve indoor environmental quality in meeting rooms," *Building and Environment*, Elsevier, 144, 365-385, 2018 [SCI, Q1, 4.01%].
- Cha, S., Seo J., Baek, S., and Koo, C., "Towards a well-planned, activity-based work environment: Automated recognition of office activities using accelerometers," *Building and Environment*, Elsevier, 144, 86-93, 2018 [SCI, Q1, 4.01%].
- Cha, S., Steemers, K., and Kim, T., "Modeling space preferences for accurate occupancy prediction during the design phase," *Automation in Construction*, Elsevier, 93, 135-147, 2018 [SCIE, Q1, 1.09%].
- Oh, J., Koo, C., Hong, T. and Cha, S., "An integrated model for estimating the techno-economic performance of the distributed solar generation system on building façades: Focused on energy demand and supply," *Applied Energy*, Elsevier, 228, 1071-1090, 2018 [SCI, Q1, 3.85%].
- Kim, J., Cha, S. (Corresponding author), Koo, C. and Tang, S., "The effects of indoor plants and artificial windows in an underground environment," *Building and Environment*, Elsevier, 138, 53-62, 2018 [SCI, Q1, 4.01%].

- Kim, T., Cha, S. and Kim, Y., "Space choice, rejection, and satisfaction in university campus," *Indoor and Built Environment*, Sage, 27 (2), 233-243, 2018 [SCIE, Q2, 42.12%]
- Cha, S., Steemers, K., and Kim, T., "Modelling building users' space preferences for group work: A discrete choice experiment," *Architectural Science Review*, Taylor & Francis, 60(6), 460-471, 2017 [A&HCI, Q1, 0.55%].
- Koo, C., Jin, R., Li, B., Cha, S., and Wanatowski, D., "Case-based reasoning approach to estimating the strength of sustainable Concrete," *Computers and Concrete. Techno-press*, 20 (6), 645-654, 2017 [SCIE, Q1, 20.07%].
- Kim, T., Cha, S. and Kim, Y., "A framework for evaluating user involvement methods in architectural, engineering, and construction projects," *Architectural Science Review*, Taylor & Francis, 59(2), 136-147, 2016 [A&HCI, Q1, 0.55%].
- Kim, T., Kim, Y. Cha, S. (Corresponding author) and Fischer, M., "Automated updating of space design requirements connecting user activities and space types," *Automation in Construction*, Elsevier, 50, 102-110, 2015 [SCIE, Q1, 1.09%].
- Cha, S. and Kim, T., "What matters for students' use of physical library space?," *Journal of Academic Librarianship*, Elsevier, 41(3), 274-279, 2015 [SSCI, Q3, 61.76%].
- Cha, S. and Kim, T., "A conceptual framework of agent-based space-use prediction simulation system," *Journal of Construction Engineering and Project Management*, Korea Institute of Construction Engineering and Management, 5(4), 12-15, 2015.
- Cha, S. and Kim, T., "A conceptual framework for developing indoor spatial choice model," *International Journal of Engineering and Technology*, IACSIT Press, 6(5), 386-391, 2014.

<domestic>

- Rhee, J. and Cha, S. (Corresponding author), "사례연구를 통한 메타버스 건축디자인에 대한 고찰," *Journal of the Architectural Institute of Korea*, 38(7), 69-80, 2022 [KCI, SCOPUS].
- Rhee, J. and Cha, S. (Corresponding author), "노인을 위한 스마트 홈 시스템 장기 모니터링 실증 연구," *Journal of KBIM*, Korean Institute of Building Information Modeling, 11(3), 75-90, 2021 [KCI].
- Ma, J. and Cha, S. (Corresponding author), "NWW 오피스 계획을 위한 BLE 비컨 기반 공간사용정보 추정," *Korean Journal of Computational Design and Engineering*, Society for Computational Design and Engineering, 25(3), 227-235, 2020 [KCI].

## Book chapters

- "메타버스에서 나는 어떤 집에 살까, 메타버스와 건축디자인," *포스트 메타버스*, 포르체, 2021

## Refereed conferences

<international>

- Lee, S., Choi, H., Cho, K., Eum, Y., Song, Y., and Cha, S., "Visual Realism of IVR Visualization Considering the Purpose of the BIM Design Communication," *The 22nd International Conference on Construction Applications of Virtual Reality (CONVR 2022)*, Seoul, Korea, 16-19 November, 2022.

- Kim, K., Lee, J., Koo, C. and Cha, S., The effectiveness of HMD-based virtual environments through 3D camera for hotel room tour, 4 (ICCEPM 2020), Hong Kong SAR, 7-8 December, 2020.
- Lee, J., Kim, K., Cha, S. and Koo, C., A Decision Support Model for Intelligent Facility Management through the Digital Transformation, The 8th International Conference on Construction Engineering and Project Management (ICCEPM 2020), Hong Kong SAR, 7-8 December, 2020.
- Ma, J., and Cha, S., Challenges and opportunities for analyzing space usage data of NWW office users, International Conference on Smart Design, Construction IT and BIM 2019, Penang, Malaysia, 7-10 July, 2019.
- Lee, J., Koo, C., and Cha, S., A Model for Integrated Analysis of Energy Consumption and Indoor Environmental Quality in Hotel Rooms, International Conference on Smart Design, Construction IT and BIM 2019, Penang, Malaysia, 7-10 July, 2019.
- Abbas, A., Choi, M., Seo, J., Cha, S., and Li, H., Communication Effectiveness in Face-to-Face and Immersive Virtual Environment: An Initial Evaluation for Construction, The CIB World Building Congress 2019, Hong Kong, 17-21 June, 2019.
- Ma, J., and Cha, S., The accuracy of BLE Beacon for analyzing space usage patterns of non-sedentary users in NWW office. The 7th International Conference on Architecture and Civil Engineering, Singapore, 27 - 28 May, 2019.
- Kim, J., Chau, C., Cha, S., Seo, J., and Koo, C., The Use of Immersive Virtual Environments (IVEs) For a Collaborative and Interactive Education in the Architectural BIM Design, 2nd International Mobile Education and Learning Technologies, Singapore, 6-7 December, 2018.
- LI, W., Koo, C., Cha, S., Lai, H., and Lee, J., A conceptual framework for the real-time monitoring and diagnostic system for the optimal operation of smart building: A case study in Hotel ICON of Hong Kong, 10th International Conference on Applied Energy (ICAE2018), Hong Kong, 22-25 August 2018.
- Koo, C. and Cha, S., A conceptual framework for a real-time-based monitoring and diagnostics for building performance and occupant behavior, International Journal of Arts & Sciences (IJAS) conference, Vienna, Austria, 25-29 June, 2017.
- Zhang, S., Kim, J., Shih, S, Koo, C., and Cha, S., Immersive virtual environment (IVE) as a potential tool for interior colour study in office environments, The 34th International Symposium on Automation and Robotics in Construction (ISARC 2017), Taipei, Taiwan, 28 June - 1 July, 2017.
- Kim, J., Koo, C., and Cha, S., Immersive virtual environment as a promising tool for the elderly-friendly assistive robot, The 34th International Symposium on Automation and Robotics in Construction (ISARC 2017), Taipei, Taiwan, 28 June - 1 July, 2017.
- Cha, S., BIM-based immersive virtual environments as a tool for efficient space planning. The 34th International Symposium on Automation and Robotics in Construction (ISARC 2017), Taipei, Taiwan, 28 June - 1 July, 2017.
- Cha, S., Integration of choice modelling theory with immersive virtual environments for modelling space preference toward more accurate space utilisation prediction. The 5th International Conference on Architecture and Civil Engineering, Singapore, 8 - 9 May, 2017.
- Cha, S. and Kim, T. Towards more accurate space-use prediction: A conceptual framework of an agent-based space-use prediction simulation system. The 6th International

- Conference on Construction Engineering and Project Management (ICCEPM), Busan, Korea, 11 - 14 October, 2015.
- Kim, T. and Cha, S., Evaluating space-use prediction approaches towards sustainable buildings. The 10th International Symposium on Architectural Interchanges in Asia, Hangzhou, China, October 14 - 17, 2014.

<domestic>

- Cho, K., Eum, Y., Choi, H., Lee, S., and Cha, S., "기존 가상 업무 공간 플랫폼의 사례 분석을 통한 가상 업무 공간의 동향 분석", Summer Conference of Society for Computational Design and Engineering annual conference, Seoul, Korea, 24-26 August, 2022.
- Lee, C., Lee, J., Jo, T., Ma, J., and Cha, S., "지능형 건축공간 사용 및 만족도 예측", Summer Conference of Society for Computational Design and Engineering annual conference, Jeju, Korea, 25-28 August, 2021.
- Kim, K. and Cha, S., "가상환경에서 비언어적 커뮤니케이션 효과에 대한 고찰의 필요성," Winter Conference of Society for Computational Design and Engineering annual conference, Jeju, Korea, 26 November 2020.
- Kim, K. and Cha, S., "빅데이터 기반 고객 맞춤형 온라인 VR 갤러리 플랫폼 '갤러리 브이에어,'" Winter Conference of Society for Computational Design and Engineering annual conference, Jeju, Korea, 26 November 2020.
- Jo, T., Ma, J., and Cha, S., Proposal for an Integrated IoT-based Smart Home Environment to Monitor the Healthcare of Older Adults for Aging in Place, Summer Conference of Society for Computational Design and Engineering annual conference, Seoul, Korea, 17 Aug, 2020.
- Kim, K., Ma, J., and Cha, S., "파노라믹 VR 과 3D VR 가상 전시관에서의 사용자 현존감에 대한 직접 비교연구의 필요성," Summer Conference of Society for Computational Design and Engineering annual conference, Seoul, Korea, 17 Aug, 2020.
- Cha, S., IoT-based indoor positioning and activity recognition system, KIBIM annual conference, Seoul, Korea, 13 June, 2019.
- Lim, J. and Cha, S., The Role of Tactile and Olfactory Sense in Design Review Using Virtual Reality, KIBIM annual conference, Seoul, Korea, 13 June, 2019.
- Lee, J., Koo, C., and Cha, S., A Real-Time Management Framework for the Energy Efficiency in a Room of Building via IoT-based Sensor Network: Focused on Hotel Guestroom, Korea Institute of Construction Engineering and Management (KICEM) annual conference, Seoul, Korea, 9 November, 2018.

### Non-refereed publications

- Lee, J. and Cha, S., "건축 및 건설 산업에서의 메타버스 활용 가능성," Korea Institute of Building Information Modelling (KIBIM), 2022
- Lee, J. and Cha, S., "벽면녹화 기법 및 적용 사례소개," Korean Institute of Architectural Sustainable Environment and Building Systems, 15(2), 2021
- Ma, J. and Cha, S., "Research Trend of Space Use Data Estimation for Applying NWW Office Planning," Korea Institute of Building Information Modelling (KIBIM), 9(2), 16-22, 2019

Baek, S. and Cha, S., "Research Trends in measuring occupant behavior towards for the application of activity-based working environment," Construction Engineering and Management, Korea Institute of Construction Engineering and Management (KICEM), 18(6), 53-55, 2017.

Cha, S. and Kim, T., "Global Research Trends in Prediction of Occupancy schedules for Building Simulations," Construction Engineering and Management, Korea Institute of Construction Engineering and Management (KICEM), 15(5), 52-54, 2014.

### Invited talks

"메타버스와 도시 공간", 융복합연구회, 한국도시설계학회, 23 August 2022.

"메타버스 시대 건축산업의 미래", Tech Advanced, 삼성물산, 21 April 2022.

"Smart home for the elderly", @TABLE, Graduate School of Science and Technology Policy, KAIST, 17 January 2022.

"The effectiveness of photo based IVE spatial experience for hotel room tour", IMPACT 2021, SHTM, the Hong Kong Polytechnic University, 16 December 2021.

"The Future workplace", 2021 Fall GSCT Colloquium, KAIST, 30 November 2021.

"Metaverse and architectural design", 메타버스에 대한 다양한 시선과 전망, 대전정보문화산업진흥원, 17 November 2021.

[https://www.youtube.com/watch?v=Rwj17\\_PioOY&t=177s](https://www.youtube.com/watch?v=Rwj17_PioOY&t=177s)

"Virtual architecture and design," Better City and Smarter Life Forum, KAIST, 17 November 2021.

"Virtual world and architecture" 가상융합경제 활성화 포럼 기술분과 2 차 세미나, 5 October, 2021. <https://www.youtube.com/watch?v=qod7OMRv6QQ&t=320s>

"Human-centered space design," Seoul National University, 24 July, 2020

"Smart office design: New ways of working," BuildingSmart Forum, 16 April, 2019.

<https://www.ikld.kr/news/articleView.html?idxno=203071>

"User-centered design and evaluation," Korea University, 4 December, 2018

"홍콩 건설환경 및 메가 프로젝트," 고려대학교 건설경영최고위과정, 15 May, 2018

"User experience design and evaluation," Chosun University, 3 January, 2018.

"Pre-occupancy Evaluation of Building Design," Yonsei University, 29 December, 2017

### Media interviews

[트렌드 ZIP] 메타버스 속 디자인 직업 | EP.2, DDP Seoul, Seoul Design Foundation, 2022

<https://www.youtube.com/watch?v=KqoVndmTykk&t=141s>

허물어진 물리적 장벽...메타버스 병원 시대 열리나, 메디컬타임즈, 2022

<https://m.medicaltimes.com/News/NewsView.html?ID=1144923>

위치 추적이 가능한 비컨(Beacon) 시스템으로 새로운 사무공간을 계획하다, 한양뉴스, 2019

<http://www.newshyu.com/news/articleView.html?idxno=501543>

### Research projects (Ongoing)

창의적 협업을 위한 메타버스 가상 오피스 공간 디자인 연구, Principal Investigator, C2 프로젝트, 2022 (KRW20,000,000).

메타버스 건축 공간 디자인 프레임워크, Principal Investigator, 한국연구재단, 2022-25 (KRW60,000,000).

가상/증강현실과 공간디자인 결합을 통한 지하도시 인간 장기거주성 공간설계 기술개발, Principal Investigator, 미래지하도시연구센터, 2022-23 (KRW200,000,000).

Iot/VR/AR 을 활용한 최적 인텔리전트 공간 디자인 설계, Principal Investigator, 한국과학기술원, 2021-24 (KRW120,000,000).

인공지능 기반의 건축설계 자동화 기술 개발, 국토교통과학기술진흥원, 2021-25 (KRW279,656,000).

데이터기반 오피스 계획을 위한 IoT 센서·인공지능 적용 자동 활동패턴 정보 생성 시스템, Principal Investigator, 한국연구재단, 2020-23 (KRW137,500,000).

### **Research projects (Completed)**

확장형 리빙랩을 통한 노인 맞춤형 주거복지 통합서비스 개발, Co-investigator, 한국연구재단, 2019-22 (KRW450,000,000).

몰입형 가상환경과 초이스 모델링이론 기반 공간선호도 모델링, Principal Investigator, 한국연구재단, 2019-22 (KRW60,000,000).

예술분야 생태계 재활성화를 위한 온라인 VR 전시공간 제작 플랫폼, Principal investigator, 예술경영지원센터, 2021-22 (KRW49,000,000).

사용자 공간 경험 평가를 위한 몰입형 가상 환경 활용 연구, Principal investigator, 한양대학교, 2021-22 (KRW15,000,000).

Multi-Intelligent (MI) 공간재생디자인 인재양성팀(BK21 Four), Co-investigator, 한국연구재단, 2020-27 (KRW2,100,000,000).

최적 공간 계획을 위한 인공지능 기반 활동인지 프레임워크 개발, Principal Investigator, 한양대학교, 2020-22 (KRW52,000,000).

빅데이터 기반 고객 맞춤형 온라인 VR 갤러리 플랫폼 ‘갤러티브이에어’, Principal investigator, 중소벤처기업부, 2020-21 (KRW48,000,000).

건축 디자인 리뷰 단계에서 촉각과 후각을 접목한 가상현실 공간 경험, Principal Investigator, 한양대학교, 2020-21 (KRW15,000,000).

Smart 오피스를 구현을 위한 IoT 기반 건물 사용자 행동 데이터 측정·예측 시스템 개발, Principal Investigator, 한국연구재단, 2018-20 (KRW60,000,000).

미래 기후 및 인구 변화 대응형 건물재생디자인 창의인재양성팀 [6-8 차년] (BK21 Plus), Co-investigator, 한국연구재단, 2018-2020 (KRW250,000,000).



HMD 기반 몰입형 가상현실 (Immersive Virtual Environment)을 이용한 엔드 유저 (End-user)의 건축 디자인 참여 가능성 검토, Principal Investigator, 한양대학교, 2018-19 (KRW20,000,000).

Interdisciplinary and Collaborative Learning through a BIM-based Immersive Virtual Environment in AEC Education, External Co-investigator, University Grants Committee, 2017-19, (HK\$ 492,600).

The Effectiveness of Interactive 3D Virtual Environments for Pre-Experience of Hotel Rooms, External Co-investigator, Hotel ICON R&D, 2017-19, (HK\$ 49,749).

Implementation of Food Waste Collection System for Catering Services, External Co-investigator, Recycling Fund, Hong Kong Productivity Council, 2018 - 2020, (HK\$ 2,709,050).

A Real-Time Monitoring and Diagnostics for energy efficiency and indoor environmental quality in Hotel ICON, External Co-investigator, Hotel ICON R&D, 2018-19, (HK\$ 50,000).

Integration of discrete-choice modeling theory with immersive virtual environments for modeling space preferences toward more accurate space utilization prediction, Principal Investigator, University Grants Committee, 2018-20, (HK\$466,667).

Development of Internet of Things (IoT) - based Multi-Function Smart Window by Integrating Solar PV Blind and Active Ventilation System toward Zero Energy Building, External Co-investigator, Ministry of Land, Infrastructure and Transport (South Korea), 2017-18, (KRW 70,000,000).

Understanding Activity-Based Working: A Framework for Integrating Indoor Positioning System and Automated Office Activity Recognition, Principal Investigator, Internal grant, The Hong Kong Polytechnic University, 2017-19 (HK\$105,000).

An Experimental Investigation of the Energy Saving Potential by Implementing the Real-Time Sensor and Actuator: Focused on the Indoor Environmental Quality and Smart Thermostat, Co-investigator, The Hong Kong Polytechnic University, 2017-18 (HK\$105,000).

Development of an Agent-Based Space-Use Prediction Simulation System, Principal Investigator, Start-Up Grant for New Faculty, The Hong Kong Polytechnic University, 2016-19, (HK\$500,000).

User Preference-based Space-use Probability Generation, Principal Investigator, Internal Grant, The Hong Kong Polytechnic University, 2016-18, (HK\$500,000).

Development of a Learning Package for Students to Appreciate the High-Performance Building Development, Co-investigator, DLTC Fund, The Hong Kong Polytechnic University, 2016-17, (HK\$116,000).

### **University service**

위원, 카이스트브랜드위원회, 한국과학기술원

위원장, CT 브랜딩위원회, 한국과학기술원

운영위원, 인문사회과학연구소, 한국과학기술원

학사심의위원, 인문사회융합과학대학, 한국과학기술원

운영위원, 미래지하도시연구센터, 한국과학기술원

참여교수, 메타버스융합대학원, 한국과학기술원

참여교수, 스마트시티센터, 한국과학기술원

참여교수, 아트앤테크연구센터, 한국과학기술원

참여교수, 조수미공연연구센터, 한국과학기술원

Partnership committee member, Hong Kong Polytechnic University

New program planning committee member "Building Ecology Engineering", Hong Kong Polytechnic University

Department representative of CIC Building Information Modelling education

## Teaching experience

<Undergraduate>

Smart Working Space; Architectural Modeling I; Digital Design and BIM; FM and Space; FM Research Project; Light, Man, and Environment; Engineering Management;

<Graduate>

Virtual Reality and Virtual Worlds; IoT-based Space Design; Low Carbon Building Design; Facility Management Professional Practice; Economics for Facility Management; Indoor Environmental Quality Assessment; Building Carbon Footprint Assessment; Post-Occupancy Evaluation

## Research advisees

Chun, Sookyung, Research Professor, 07/2022- present.

Cho, Kyunghyun, Ph.D. student, Principal supervisor, 06/2022- present.

Choi, Hyeokjin, MS student, Principal supervisor, 06/2022- present.

Song, Yoan, MS student, Principal supervisor, 04/2022- present.

Lee, Seung Hyun, MS student, Principal supervisor, 04/2022- present.

Lee, Jung Won, Principal supervisor, 08/2022- present.

Eum, Yujeung, MS student, Principal supervisor, 03/2022- present.

Abbas, Ali, Post-doc, HK PolyU, Co-supervisor, 12/2021- present.

Zhang, Shuzhen, Ph.D. student, HK PolyU, External co-supervisor, 07/2018 - present.

## Alumni

Rhee, Jee Heon, Post-doc, Principal supervisor, 03/2021- 06/2022 (Current: Research Professor, Korea University)

Lee, Chan Kyu, Post-doc, Principal supervisor, 06/2021- 04/2022 (Current: Post-doc, Korea Institute of Civil Engineering and Building Technology)

Ma, Jae Hoon, MS student, Principal supervisor, 03/2019 - 11/2021 (Current: Ph.D. student, College of Design, Georgia Tech)

Gassar, Abdo Abdullah Ahmed, Post-doc, Principal supervisor, 03/2020- 03/2021. (Current: Researcher, University of La Rochelle)

Lee, Byunghee, Postdoctoral Fellow, Principal supervisor (Current: Researcher, LH Institute)

Baek, Seunghyo, Postdoctoral Fellow, Principal supervisor (Current: Assistant Professor, Mokwon University)

Kim, Jeonghwan, Postdoctoral Fellow, Principal supervisor (Current: Assistant Professor, Korea National University of Transportation)

Zhang, Shaojie, Ph.D. student, External co-supervisor, 07/2016 - completed.

Whenzhuo, Li, Ph.D. student, External co-supervisor, 04/2018 - completed.

Peng, You, Visiting Ph.D. student, Eindhoven University of Technology, Host supervisor, 08/2016 - 12/2016.

### **Honors and certificates**

우수기업선정, 예비창업패키지, 중소벤처기업부, 2021  
신진연구자상(TOP 3%, Awarded to two faculty members out of 80), 한양대학교, 2021  
11 월 이달의 연구자상, 한양대학교, 2020  
신진연구자상(TOP 3%, Awarded to two faculty members out of 60), 한양대학교, 2020  
학술봉사상, 한국실내디자인학회, 2019  
Best work award, KIID International exhibition, 2019  
Best paper award, I3CDE, 2019  
Best paper award, KIBIM annual conference, 2019  
Best paper award, KICEM annual conference, 2018  
Dean's award for Outstanding Achievement in Academic Programme Development, 2016  
Introduction to University Teaching, EDC, the Hong Kong Polytechnic University, 2016  
LEED AP O+M (Operation & Maintenance), U.S. Green Building Council, 2010  
Lundgren research awards, University of Cambridge, 2014  
Kettle's Yard travel grant, University of Cambridge, 2014  
Fieldwork research grant, University of Cambridge, 2012-2014  
Erasmus grant, European Commission, 2012-2013  
USGBC Greenbuild scholarship, United States Green Building Council, 2010  
CMAA scholarship, CMAA, North California Chapter, 2010

### **Contribution to professional/community service**

한림원정책연구위원회 위원, 한림원, 2022  
융복합연구위원회 위원장, 한국도시설계학회, 2022  
한국그린빌딩협회의 홍보위원회 이사, 한국그린빌딩협회, 2022  
Associate Editor, Journal of Computational Design and Engineering, Oxford Univ. Press  
한국 BIM 학회논문집, 부편집장  
건축환경위원회 위원, 대한건축학회  
한국 CDE 학회 하계학술대회 조직위원, 한국 CDE 학회  
한국 CDE 학회 학회지 편집이사, 학술이사, 한국 CDE 학회  
The BIM 매거진 부편집장, 빌딩스마트협회  
한국생태환경건축학회 연구이사, 한국생태환경건축학회  
13 대 학술부(학술활동) 이사, 한국건축친환경설비학회  
스마트 건축위원회 부위원장, 한국건축시공학회  
스마트건축/건설 특별위원회 위원, 대한건축학회  
제주국제자유도시개발센터 기술자문위원

건설사업관리사(CMP) 자격검정출제위원, 한국 CM 협회  
 CDE2021 하계학술대회 조직위원  
 Guest Editor, Special issue "Health, Safety and Environment (HSE) in the Building and Construction Industry", Applied Sciences, MDPI, 2021  
 Review Editor, Frontiers in Psychology  
 ic Editor, Sustainability, MDPI  
 Guest Editor, Special issue "Sustainable Urban Environment and Building Energy Efficiency", Sustainability, MDPI, 2020  
 Guest Editor, Special issue "Advances in Materials, Technologies and Controls for Sustainable Building", Energies, MDPI, 2020  
 Technical Theme Chair, 8th International Conference on Construction Engineering and Project Management (ICCEPM 2020).  
 Scientific Advisory Board at the 3rd International Conference on the Human Factors in Communication of Design track, 24-28 July, 2019, Washington Hilton, Washington D.C., USA.  
 Scientific Advisory Board at the 9th International Conference on Applied Human Factors and Ergonomics (AHFE 2018) for the Human Factors in Communication of Design track, 22 - 26 July, 2018, Orlando, Florida, USA.  
 Session Chair of Construction Robotics (IV) / Design session at the 34th International symposium on Automation and Robotics in Construction (ISARC 2017), 28 June 28 - 1 July, Taipei, Taiwan.  
 Reviewer, Building Simulation, Springer.  
 Reviewer, Journal of Interior Design, Wiley.  
 Reviewer, Automation in Construction, Elsevier.  
 Reviewer, Applied Energy, Elsevier.  
 Reviewer, Building and Environment, Elsevier.  
 Reviewer, Resources, Conservation and Recycling, Elsevier.  
 Reviewer, Indoor and Built Environment, Sage.  
 Reviewer, Architectural Engineering and Design Management, Taylor & Francis.  
 Reviewer, Journal of Toxicology and Environmental Health, Taylor & Francis.  
 Reviewer, International Journal of Geo-information, MDPI.  
 Reviewer, Sensors, MDPI.  
 Reviewer, Journal of Computational Design and Engineering, Elsevier.  
 Reviewer, Frontiers in Psychology, Frontiers Media.  
 Reviewer, Renewable & Sustainable Energy Reviews, Elsevier.  
 Reviewer, Advanced Engineering Informatics, Elsevier.  
 Reviewer, KSCE Journal of Civil Engineering, Springer.  
 Reviewer, IEEE Access, IEEE.  
 Reviewer, Sustainable Cities and Society, Elsevier.  
 Reviewer, Journal of Management in Engineering, ASCE.  
 Reviewer, 한국 CDE 학회 논문집  
 Reviewer, 한국 BIM 학회 논문집  
 Reviewer, 한국방재학회 논문집  
 Reviewer, 한국디자인학회 논문집  
 Reviewer, 한국공간디자인학회 논문집

Reviewer, 한국생태환경건축학회 논문집