

Huijeong Kim, Ph.D.

Assistant Professor
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[Google Scholar](#)

My research lies at the intersection of smart building technology, decision science, and clean energy technology, with a particular focus on innovative solutions that enable smart, sustainable, and energy-resilient communities.

RESEARCH AND TEACHING INTERESTS

- Smart and Connected Communities, Human-Building Interactions; Grid-interactive Efficient Buildings, Optimal Design & Control of Building Energy Systems; Equitable Clean Energy Transition
- Human Decision Making; Mechanism Design; Game-theoretic modeling.
- Statistical Causal Inference; Machine Learning; Bayesian Data Analysis.

PROFESSIONAL EXPERIENCE

University of Kansas, Lawrence, KS

Department of Civil, Environmental & Architectural Engineering

Assistant Professor

Aug. 2024 – Present

- Development of second-life EV battery systems for resilient, grid-interactive communities.
- Design and evaluate community-scale energy storage systems by integrating virtual testbeds with real-world pilot deployment to assess safety and techno-economic feasibility.
- Conduct stakeholder-engaged research with municipalities and residents, supporting co-designed, community-centered energy solutions.

Purdue University, West Lafayette, IN

Lyles School of Civil Engineering (Architectural Engineering), Ray W. Herrick Laboratories.

Visiting Assistant Professor

Aug. 2023 – Dec. 2023

- Instructor of CE 413: Building Envelope Design and Thermal Loads (Fall 2023)

Postdoctoral Research Assistant

Aug. 2022 – July. 2024

- Patent application and commercialization of the visual and voice interactive smart home energy management system (i.e., “MySmartE”).
- Scaled the MySmartE deployment with a local utility company and local housing authorities, and developed the central administrative manager portal of MySmartE for the system maintenance.
- Mechanism design for the sustainable operation of energy efficiency programs.

Research Assistant

Aug. 2017 – Aug. 2022

- SCC-IRG Track 1: Sociotechnical Systems to Enable Smart and Connected Energy-Aware Residential Communities (National Science Foundation, No. 1737591)
 - Development and field deployment of MySmartE (i.e., an eco-feedback and social gaming platform to promote energy conserving behaviors in multi-unit residential buildings).
 - Investigation of occupant decision-making process and game-theoretic mechanisms for the optimal operations of social games.

Hanyang University, Seoul, Korea

Building Mechanical and Environmental Systems Laboratory

Research Assistant

Mar. 2015 – Feb. 2017

- Development of liquid desiccant and evaporative cooling assisted 100% outdoor air system
- Thermoelectric cooling-based waste-heat recovery in dedicated outdoor air systems

EDUCATION

Purdue University, IN, USA Aug. 2017 – Aug. 2022

Ph.D. in Civil Engineering (Architectural Engineering group)

- Dissertation: “*Development of a user-interactive smart home energy management system for connected residential communities*”
- Academic advisor: Dr. Panagiota Karava

Hanyang University, Seoul, Korea

Mar. 2015 – Feb. 2017

M.S. in Architectural Engineering

- Thesis: “*Comparative analysis of the annual performance of a dedicated outdoor air system and a desiccant-enhanced evaporative air conditioner*”
- Academic advisor: Dr. Jea-weon Jeong

Hanyang University, Seoul, Korea

Mar. 2011 – Feb. 2015

B.S. in Architectural Engineering

AWARDS & SCHOLARSHIP

IAQVEC 2026 Early-Career Professional & Junior Faculty Fellowship	May, 2026
ASHRAE 2025 Best Paper Award	Jun. 2025
BECC Fellow Scholarship, Behavior, Energy, and Climate Change Conference	Sept. 2023
Postdoctoral Supplemental Travel Grant, Purdue University	Sept. 2023
College of Engineering Travel Award, Purdue University	Nov. 2022
Ross Fellowship, Purdue University	Aug. 2017 – Aug. 2018

PATENTS

MySmartE: An Eco-feedback and Gaming Platform for Residential Energy Management (2023-KARA-69985), U.S. Filed on September 8, 2022 ([link](#))

RESEARCH PROPOSAL

1. (Submitted) Smoke-Ready Buildings Tool: An Interactive Tool for Wildfire Smoke Preparedness in Community Buildings, \$1384,388 (\$612,414 at KU), Environmental Protection Agency, PI: Y Kim, <u>Role: Co-PI</u> , KU-lead (KU-L Sub-award), (9/2026 – 8/2029)	2026
2. (Submitted) NSF ISP: User-Centric and Attack-Resilient Privacy Control of Data Streams for Smart Community Energy Infrastructure, \$600K, National Science Foundation, PI: W. Han, <u>Role: Co-PI</u>	2026
3. (Submitted) NSF EPSCoR FEC: Cognitive Digital Twins for Artificial Intelligence-Driven, Use-Inspired Discovery and Critical Infrastructure Resilience across Maine, Kansas, and Louisiana (CITADEL), \$790K, National Science Foundation, PI: P. Chakraborty, <u>Role: Co-PI</u> , (7/2026 – 6/2030)	2026
4. (Funded) SCC-DG: Community-driven Circular Energy Storage: Strengthening Resilience Through Technological Charity, \$150K, National Science Foundation, <u>Role: PI</u> (7/3/2035 – 9/30/2026)	2025
5. (Submitted) Douglas County Community Change (DCCC), Inflation Reduction Act Community Change Grants Program, U.S. Environmental Protection Agency, Lead applicant: Douglas County	2024
6. (Funded) Transforming Building Energy Solutions with Causal Modeling, New Frontiers in Research Fund, Government of Canada, PI: S. Lee, <u>Role: Collaborator</u>	2024
7. (Funded) Task Innovation Fund: MySmartE – An eco-feedback and gaming platform for home energy management, \$25,000, Purdue University, PI: P. Karava.	2023
8. (Funded) SCC-IRG Track 1: Smart energy assistants for affordable housing communities, \$1.7M, National Science Foundation, PI: P. Karava, <u>Role: Senior personnel</u>	2023

PUBLICATIONS

In Referred Journals

1. H. Kim, J. Go, H. Devarapalli, I. Bilonis, P. Karava, J. E. Braun (2025). Social energy games for smart and connected residential communities: Mechanism design. *Energy and Buildings*, 346, 116187. <https://doi.org/10.1016/j.enbuild.2025.116187>
2. H. Kim, I. Bilonis, J. E. Braun, P. Karava (2023) *Human Decision Making During Eco-feedback Intervention in Smart and Connected Energy-aware Communities*. *Energy and Buildings*
3. H. Kim, S. Ham, M. Promann, H. Devarapalli, G. Bihani, T. Ringenberg, V. Kwarteng, I. Bilonis, J. E. Braun, J. T. Rayz, L. Raymond, T. Reimer, P. Karava (2022) *MySmartE – an Eco-feedback and Gaming Platform for Smart and Energy-efficient Residential Communities*. *Building and Environment*
4. H. Kim, S. Ham, D. Yoon, J. Jeong (2017) *Cooling Performance Measurement of Two Cross-flow Indirect Evaporative Coolers in General and Regenerative Operation Modes*. *Applied Energy*
5. S. Lee, H. Kim, H. Dong, J. Jeong (2017) *Energy Saving Assessment of a Desiccant-enhanced Evaporative Cooling System in Variable Air Volume Applications*. *Applied Thermal Engineering*
6. H. Kim, S. Lee, S. Cho, J. Jeong (2016) *Energy Benefit of a Dedicated Outdoor Air System over a Desiccant-enhanced Evaporative Air Conditioner*. *Applied Thermal Engineering*
7. M. Kim, D. Yoon, H. Kim, J. Jeong, *Retrofit of a Liquid Desiccant and Evaporative Cooling-assisted 100% Outdoor Air System for Enhancing Energy Saving Potential*. *Applied Thermal Engineering*
8. H. Kim, D. Yoon, J. Jeong (2015) *Regional Optimum Dedicated Outdoor Air System and Energy Consumption Characteristics*. *Journal of Architectural Institute of Korea Planning & Design*

In Referred Conference Proceedings

1. F. Barat, S. Wilson, H. Kim, H. Fang*, System Identification of Lithium-Ion Battery Equivalent Circuit Models Using Ensemble Kalman Inversion, The 2026 American Control Conference, New Orleans, Louisiana, May 26-29, 2026
2. M. Nazarpour, A. Kondyli, M. Hashemi, H. Fang, X. Han, H. Kim*, Challenges and Drivers of Battery Second-Use Community Energy Storage Development: Integrating Social, Techno-Economic, and Behavioral Perspectives, 12th International Conference on Indoor Air Quality, Ventilation & Energy Conservation in Buildings, Los Angeles, CA, May 18-22, 2026
3. J. Go, H. Kim, I. Bilonis, P. Karava, *Modeling Thermostat Adjustment Behavior in Residential Communities During Eco-feedback Energy Interventions*, 8th International High Performance Buildings Conference, West Lafayette, July 15-18, 2024
4. F. Wu, H. Devarapalli, H. Lee, J. Go, H. Kim, P. Karava, J. E. Braun, D. Ziviani, W. T. Horton, K. Kircher, *Investigating Occupant Thermostat Adjustment Behavioral Patterns in Different Heat Pump Operation Modes: A Field Experiment*, 8th International High Performance Buildings Conference, West Lafayette, July 15-18, 2024
5. H. Kim, I. Bilonis, J. E. Braun, P. Karava, *Social energy games for smart and energy-efficient multi-unit residential building: mechanism design*, 2024 ASHRAE winter conference, Chicago, January 20-24.
6. H. Kim, *MySmartE – A software platform for smart and connected energy-aware residential communities*, 2023 Indiana Housing Conference, Indianapolis, September 26-27.
7. H. Kim, S. Ham, M. Promann, H. Devarapalli, V. Kwarteng, G. Bihani, T. Ringenberg, I. Bilonis, J. E. Braun, J. T. Rayz, P. Karava, *MySmartE - A cloud-based smart home energy application for energy-aware multi-unit residential buildings*, 2023 ASHRAE winter conference, Atlanta, February 4-8.
8. H. Kim, I. Bilonis, J. E. Braun, P. Karava (2022), *Human Decision Making in Smart and Connected Energy-aware Residential Communities*, INFORMS annual, Indianapolis, October 15-19.
9. H. Kim, E. Choi, J. Jeong (2016) *Optimization of an Indirect Evaporative Cooler in Liquid Desiccant and Evaporative Cooling-assisted 100% Outdoor Air Systems*. Proceedings meeting of the 3rd Asia conference of International Building Performance Simulation Association, Jeju, Korea, November 27-29
10. H. Kim, H. Dong, J. Jeong (2016) *Performance Evaluation of Two Cross Type Indirect Evaporative Air Coolers*. CLIMA 2016 - proceedings of the 12th REHVA World Congress, May 22-25, Aalborg, Denmark
11. H. Kim, S. Lee, J. Jeong (2015) *Comparison of Energy Performance in Dedicated Outdoor Air System (DOAS) and Desiccant-enhanced Evaporative air Conditioner (DEVAP)*, Proceedings of the 13th Asia Pacific Conference on the Built Environment, Hongkong, November 19-20
12. H. Kim, S. Cho, J. Jeong (2015) *Applicability Analysis of Thermoelectric Cooling System in Dedicated Outdoor Air System*. Proceedings of the Autumn Annual Conference of the Korean Institute of Architectural Sustainable Environment and Building Systems, Korea, November

13. H. Kim, S. Lee, J. Jeong (2015) *Performance Comparison of the Dedicated Outdoor Air System and Desiccant-enhanced Evaporative Cooling system*. Proceedings of the Autumn Annual Conference of Architectural Institute of Korea, Korea, October
14. H. Kim, H. Dong, J. Jeong (2015) *Optimum Dedicated Outdoor Air system for Korea and Energy Consumption Characteristics*. conference of Architectural Institute of Korea, Korea, April

PRESENTATION

Workshop

1. H. Kim, Community-driven Circular Energy Storage: Strengthening Resilience Through Technological Charity. Presented at the 7th Annual Lawrence EV Showcase, Oct. 12, 2025, Lawrence, Kansas
2. H. Kim, *Implementation of an Eco Feedback and Gaming Platform for Smart and Energy Aware Residential Communities*. FoBI workshop (Future of the Building Industry), 2022

Posters

1. Presented a poster at 2024 Smart and Connected Communities PI meeting at Smart Cities Connect Conference & Expo, Nashville, TN, February 28-29.
2. H. Kim, *MySmartE - An eco-feedback and gaming platform for Energy-aware Residential Communities*, 2023 Behavior, Energy & Climate Change Conference, Sacramento, CA, November 12-15
3. H. Kim, P. Karava, *Evaluating Energy-aware Thermostat adjustment Behaviors in Smart and Connected Communities*. Presented at 2023 Herrick annual Industrial Advisory Committee meeting (IAC), October
4. H. Kim, Vanessa Kwarteng, P. Karava, J. E. Braun, I. Bilonis, *Human Decision Making in Smart and Connected Energy-aware Residential Communities*. Presented at 2022 Herrick annual IAC meeting, October
5. Presented a poster at 2022 Smart and Connected Communities PI meeting, Arlington, VA, October 10-12.
6. H. Kim, S. Ham, M. Promann, P. Karava, J. E. Braun, I. Bilonis, *Implementation of a Social Game with User-centric Eco-feedback in a Multi-family Residential Building*. Presented at the Virtual 2021 annual Herrick IAC meeting, October
7. Presented a poster at Virtual 2021 Smart and Connected Communities PI meeting, April 7-9
8. H. Kim, S. Ham, M. Promann, P. Karava, J. E. Braun, I. Bilonis, *User-centric Eco-feedback Design for Multi-family Residential Buildings*. Presented at 2019 Herrick annual IAC meeting, October
9. Presented a poster during 2019 Smart and Connected Communities PI meeting at Smart Cities Connect Conference & Expo, Denver, CO, April 1-3.
10. Presented a poster during 2018 Smart and Connected Communities PI meeting at Smart Cities Connect Conference & Expo, Kansas City, MO, March 26-27.

TEACHING EXPERIENCE

Assistant Professor, University of Kansas

Aug. 2024 – Present

- ARCE 767: Building Energy Modeling (Fall 2026 – Instructor, Graduate Course)
- ARCE560: HVAC&R Systems Design (Spring 2026 – Instructor, Undergraduate Course)
- ARCE460: Building Thermal Science (Fall 2024, 2025 – Instructor, Undergraduate Course)
- ARCE 597: Comprehensive Design Project (Spring 2026 – ME Instructor, Undergraduate Course)
- ARCE 350: Building Materials Science (Spring 2025 – Instructor, Undergraduate Course)

Visiting Assistant Professor, Purdue University

Aug.– Dec. 2023

CE413: Building Envelope Design and Thermal Loads (Fall 2023).

- Instructor (Undergraduate Course), Course development, Teaching (Lectures / Labs), Grading
- Covered basic thermal processes in buildings and presented comprehensive methods for thermal design of envelope assemblies in commercial and residential buildings.

Student Mentor, Purdue University

2017 – 2024

- Mentored 5 Ph.D students in developing research plans, designing experiments, processing field data, conducting post-experiment interviews, and developing Hierarchical Bayesian models.

PROFESSIONAL SERVICES

Technical Reviewer for Refereed Journals

Energy and Buildings (2015 – present), Building and Environment (2022 – current), Neural Networks (2023)

Technical Reviewer for Conferences

- IEEE BigData 2026 conference

2026

• 12th International Conference on Indoor Air Quality, Ventilation & Energy Conservation in Buildings	2025
• 7 th International High Performance Buildings Conference at Purdue	2022
• 6 th International High Performance Buildings Conference at Purdue	2021
• 2020 Building Performance Analysis Conference and SimBuild	2020
Conference Session Chair	
• Session Chair, 12 th International Conference on Indoor Air Quality, Ventilation & Energy Conservation in Buildings, Los Angeles, CA	July. 2024
• Session Chair, 8 th International High Performance Buildings Conference, Purdue	July. 2024
• Session Chair, 7 th International High Performance Buildings Conference, Purdue	July. 2022
• Co- Chair, 5 th International High Performance Buildings Conference, Purdue	July. 2018
Technical Committee activities	
• American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE): Technical Committee 7.5 (Smart Building Systems), 7.10 (Occupant Behavior in Building Design and Operation)	Since 2022
• IEA EBC - Annex 95 - Human-centric buildings for a changing climate	Since 2024
Events organized	
• [KU Workshop] Advancing Energy Resilience Through Community Energy Storage, University of Kansas, Lawrence, KS (Role: Organizer and Host)	June, 2026.
Service	
• KU ASHRAE Student Branch Faculty Advisor	2017 - 2023
• GEA Research Showcase Judge, University of Kansas	2025 - Present
• CTE Faculty Ambassador for CEAE	2025, 2026
	2026 - Present
MEMBERSHIP	
• American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Associate Member.	2015 - Present
• American Society of Civil Engineers (ASCE), Associate Member.	2024 - Present
• Korean Institute of Architectural Sustainable Environment and Building Systems, Member.	2015 - 2017
• Architectural Institute of Korea, Member.	2015 - 2017