

RESEARCH INTERESTS

Computational Design, Generative Design Systems, Computational Geometry, Structural Engineering, Optimization

EDUCATION

Massachusetts Institute of Technology	Cambridge, MA
• <i>Ph.D. in Building Technology GPA: 5.0 / 5.0</i>	Sep. 2023 – Present
Advised by Prof. Caitlin Mueller (Digital Structures)	
Carnegie Mellon University	Pittsburgh, PA
• <i>M.S. in Computational Design GPA: 4.03 / 4.3</i>	Sep 2021 – May 2023
Advised by Prof. Daniel Cardoso Llach, Prof. Chris McComb	
Seoul National University	Seoul, South Korea
• <i>College of Liberal Studies (Presidential Award) B.Arch, BBA GPA: 4.07 / 4.3</i>	Mar 2014 – Feb 2020

PUBLICATIONS

- Deep reinforcement learning for efficient exploration of combinatorial structural design spaces**
• *Chloe S.H. Hong, Keith J. Lee, Caitlin Mueller*
International Association for Shell and Spatial Structures (IASS) 2025
- Adaptation and Challenges in Human-AI Partnership for the Design of Complex Engineering Systems**
• *Zeda Xu, Chloe Hong, Nicolás F. Soria Zurita, Joshua T. Gyory, Gary Stump, Hannah Nolte, Jonathan Cagan, Christopher McComb*
International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (ASME IDETC-CIE) 2023
- Building Hanok Components & Techniques**
• *Jeon BongHee, Kim Jihee, Hong Soohwa, Chae Uri, Kwon Ah-song*
South Korea's Architecture and Urban Institute (AURI) 2017

ACADEMIC SERVICES

- **NeurIPS Creative AI Track** Reviewer 2024, 2025

AWARDS & GRANTS

- MIT Generative AI Impact Consortium (MGAIC)**
• *\$100,000 for AI empowered human-centered design: from identifying latent human needs to generating human-guided designs of physical systems* 2025
- Kwanjeong Educational Foundation Graduate Scholarship**
• *One of 40 recipients to be funded for doctoral studies.* 2023-2025
- South Korea National Graduate Scholarship**
• *One of 64 recipients rewarded by the South Korean government.* 2021-2023
- Carnegie Mellon University Merit Scholarship**
• *Merit-based scholarship for the entirety of master's degree awarded upon admission* 2021-2023
- Seoul National University**
• *Graduated Class Representative of College of Liberal Studies* 2020
Merit-based Scholarship | National Scholarship for Science and Engineering | Eminence Scholarship 2014-2020

SELECTIVE COURSEWORK

SU CS224W : **Machine Learning with Graphs** Prof. Jure Leskovec

Physics informed spatial temporal graph learning

MIT 6.S978 : **Deep Generative Models** Prof. Kaiming He

 *Reinforcement Learning as Probabilistic Inference*

MIT 4.450 : **Computational Structural Design and Optimization** Prof. Caitlin Mueller

 *Learning High-Performing Designs Across Topologies*

MIT 6.7960 : **Deep Learning** Prof. Philip Isola

MIT 6.5320 : **Geometric Computing** Prof. Piotr Indyk

 *Efficient Agglomerative Hierarchical Clustering using Locality Sensitive Hashing*

CMU 24679 : **Statistical Techniques in Robotics / Deep Reinforcement Learning** Prof. David Held

 *Comparison and Modification of RL Agents for Parking*

CMU 24679 : **Designing and Deploying AI/ML Systems** Prof. Chris McComb

CMU 24354 : **Gadgetry - Sensors, Actuators and Processors** Prof. Douglas Weber

 *Sensor based Dynamic Projection Mapping*

EXPERIENCE

- **Massachusetts Institute of Technology**

Cambridge, MA

Teaching Assistant

2025

- 4.453 Creative Machine Learning for Design The course focuses on applications of machine learning for creative design generation and data-informed design exploration, with an emphasis on visual and 3D generative systems. For a 30 person class, I graded assignments, advised final projects and gave a lecture on reinforcement learning for design tasks.

- **Autodesk**

San Francisco, CA

Research Intern

2022

-  *RevitAssembly* I developed an assembly-aware graph representation for 3D models of building components involving geometric and semantic compositional constraints. I queried and linked geometric data and tabular annotations from Revit 3D models to generate a dataset used for generative tasks.

- **Carnegie Mellon University**

Pittsburgh, PA

2021-2022

Research Assistant

-  *Robotic Concrete Additive Manufacturing* I designed material studies to visualize and quantify the permeation patterns of binders within concrete batches at a macro level and developed a physics-based particle simulation tool that predicts water absorption and penetration at the micro level. These studies informed the software printing parameters and hardware design for robotic concrete printing.

- **Human-Centered Computer Systems Lab, Seoul National University**

Seoul, South Korea

Research Intern

2021

-  *Bidirectional Telepresence* I proposed a human-centered system for telepresence that integrates sensing user attention through gaze and matching coordinates of two different spaces based on body position and spatial functionality.

- **Seoul National University**

Seoul, South Korea

Research Intern

2017-2021

-  *JoineryBIM* I developed a parametric data structure for designing complex wooden joinery, used to facilitate the design of Hanok, Korea's traditional building typology, in BIM software.
- Architecture Practice I developed computational tools to facilitate the design and fabrication for private galleries, residential the *Venice Architecture Biennale* (2018), *Venice Art Biennale Korea* exhibition space (2019), *Hyundai Outlet Mall* (2019), and *Hyundai Motors Future Lab* (2020) (with Herzog de Meuron).

SKILLS

• **Languages** : Python, C/C++, Julia, MATLAB

• **Frameworks** : PyTorch, Tensorflow & Keras

• **3D software** : Rhino, Grasshopper, Unity, Adobe Design Suite

• **Prototyping** : 3D printing, CNC milling, Laser cutting

updated Nov 2025