Seung Won Lee

Design AI Lab · Human-Centered AI Design Institute · Hanyang University

HUMAN-AI INTERACTION · USER MODELING · ADAPTIVE AI UX

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LOCATION Seoul, Republic of Korea

Postdoctoral Researcher in the Design AI Lab and Human-Centered AI Design Institute at Hanyang University, working on human-centered AI and design informatics, focused on how AI can interpret user behavior and decide what information to provide, when, and in what form. I turn **comparison choices, gaze, editing actions, and creative traces** into signals for preference modeling, generative exploration, and adaptive AI intervention. My systems infer implicit intent, personalize generative models across multi-turn interaction, and surface alternatives or explanations without disrupting workflow. Across projects, I study how implicit user data can be translated into model behavior and interface interventions that remain adaptive, trustworthy, and controllable. Outcomes appear in *Scientific Reports* (Q1), *ACM CHI*, *Advanced Engineering Informatics* (Q1), and *Automation in Construction* (Q1).

EDUCATION

Mar 2024 – Aug 2026 **Ph.D., Interior Architecture Design**
Hanyang University, Seoul · Advisor: Kyung Hoon Hyun · Thesis: *Enabling Implicit Designer Preference Support through Computational Modeling of Design Behavior*

Sep 2021 – Feb 2024 **M.S., Interior Architecture Design**
Hanyang University, Seoul · Advisor: Kyung Hoon Hyun · Thesis: *Analyzing Designer's Design Behavior to Predict Design Intentions and Support Design Exploration*

Mar 2015 – Feb 2021 **B.S., Interior Architecture Design**
Hanyang University, Seoul

Mar 2015 – Feb 2021 **B.S., Architectural Engineering**
Hanyang University, Seoul

PUBLICATIONS

01 **Design LoRA: Interactive Fine-Tuning of Text-to-Image Models with Designer-in-the-Loop Feedback**
Seung Won Lee, Yejin Yun, Kyung Hoon Hyun.
Advanced Engineering Informatics, accepted, 2026.
SCIE · Q1 · IF TOP 2% · ACCEPTED · FIRST AUTHOR

02 **Part-Level 3D Shape Generation Driven by User Intention Inference with Preferential Bayesian Optimization**
Seung Won Lee, Jiin Choi, Kyung Hoon Hyun.
Scientific Reports, 16, 7715, 2026.
SCIE · Q1 · IF TOP 18% · FIRST AUTHOR · doi

03 **Modeling Sequential Design Actions as Designer Externalization on an Infinite Canvas**
Yejin Yun†, **Seung Won Lee**†, Jiin Choi†, Kyung Hoon Hyun.
Proceedings of the ACM CHI Conference Extended Abstracts on Human Factors in Computing Systems, 2026.
TOP-TIER CONFERENCE POSTER · CO-FIRST AUTHOR

04 **GenPara: Enhancing the 3D Design Editing Process by Inferring Users' Regions of Interest with Text-Conditional Shape Parameters**
Jiin Choi, **Seung Won Lee**, Kyung Hoon Hyun.
Proceedings of the ACM CHI Conference on Human Factors in Computing Systems, 2025.
BK TOP-TIER CONFERENCE · doi

05 **The Impact of Sketch-Guided vs. Prompt-Guided 3D Generative AIs on the Design Exploration Process**
Seung Won Lee, Tae Hee Jo, Semin Jin, Jiin Choi, Kyungwon Yun, Sergio Bromberg, Seonghoon Ban, Kyung Hoon Hyun.
Proceedings of the ACM CHI Conference on Human Factors in Computing Systems, 2024.
BK TOP-TIER CONFERENCE · FIRST AUTHOR · doi

06 **BIGaze: An Eye-Gaze Action-Guided Bayesian Information Gain Framework for Information Exploration**
Seung Won Lee†, Hwan Kim†, Taeha Yi†, Kyung Hoon Hyun.
Advanced Engineering Informatics, 58, 102159, 2023.
SCIE · Q1 · IF TOP 4% · CO-FIRST AUTHOR · doi

PUBLICATIONS - CONTINUED

07 **CreativeSearch: Proactive Design Exploration System with Bayesian Information Gain and Information Entropy**
Kihoon Son[†], **Seung Won Lee**[†], Wondeuk Yoon, Kyung Hoon Hyun.
Automation in Construction, 142, 104502, 2022.
SCIE · Q1 · IF TOP 1% · CO-FIRST AUTHOR · doi

08 **Workflow-Net: Toward Understanding Designer Workflows in Generative AI-Driven Systems through Comparing Node- and Prompt-Based Interfaces**
Tae Hee Jo, Jiin Choi, Semin Jin, **Seung Won Lee**, Yugyeong Jang, Sang Woon Park, Seonghoon Ban, Kyung Hoon Hyun.
Archives of Design Research, 39(2), 7–34, 2026.
SCOPUS · link

09 **Detecting Design Idea Divergence Strategy in the Early Design Phase**
Seung Won Lee, Kyung Hoon Hyun.
Korean Institute of Interior Design Journal, 32(1), 2023.
KCI · FIRST AUTHOR

MANUSCRIPTS UNDER REVIEW

U1 **Preference-based design trade-off management in 3D generation.**
Seung Won Lee, ..., Kyung Hoon Hyun · Submitted to: *International Journal of Human-Computer Studies* · Status: major revision.
MAJOR REVISION · SCIE JOURNAL · FIRST AUTHOR

U2 **How Agent-Driven Creative Trace Mining Reshapes Design Behavior.**
Seung Won Lee[†], Jiin Choi[†], Yejin Yun[†], ..., Kyung Hoon Hyun · Submitted to: *International Journal of Human-Computer Interaction* · Status: minor revision.
MINOR REVISION · SCIE JOURNAL · CO-FIRST AUTHOR

SELECTED PATENTS

REGISTERED & ALLOWED

- **Design Generation Method Based on User Preference.** K. H. Hyun, **S. W. Lee**, J. Choi. KR 10-2792802, registered Apr 3, 2024.
- **Method for Clustering Design Image.** K. H. Hyun, K. Son, **S. W. Lee**. KR 10-2882657, registered Nov 3, 2025.
- **Design Image Clustering Method and Apparatus.** K. H. Hyun, K. Son, **S. W. Lee**. US Patent US12,632,494 B2 registered May 19, 2026

FILED

- **Method of Generating Design Based on User Preference.** US 18/411,182, filed Jan 12, 2024.
- **Text-Conditional Shape Parameter System for Inferring Design Preferences in 3D Design Space.** KR 10-2024-0054885, filed Apr 24, 2024.
- **3D Shape Manipulation with Multi-Objective Preference Bayesian Optimization.** KR 10-2024-0054886, filed Apr 24, 2024.
- **System for Design-Artifact-Based Image Generation.** KR 10-2025-0184966, filed Nov 28, 2025.
- **Action-Centered Design-Process Workflow Analysis.** KR 10-2025-0184961, filed Nov 28, 2025.

Cumulative portfolio: 2 KR registered · 11 KR filed · 2 design applications allowed for registration · 5 PCT/US filings · 1 US registered.

ACADEMIC SERVICE & INVITED ACTIVITY

REVIEWER (EXTERNAL)

- ACM CHI 2026
- ACM DIS 2026
- ACM UIST 2026
- ACM UIST 2025
- ACM CSCW 2025 (July Cycle)
- Archives of Design Research

INVITED & INTERNATIONAL

- HCI Korea 2025 — Invited Talk (Top-Conference Program, SIGCHI-sponsored venues).
- UIST 2025 Mind & Motion Workshop — participant.
- CHI 2026 Herding CATs: Making Sense of Creative Activity Traces — participant. Position paper: *Beyond Semantic Similarity: Open Challenges for Embedding-Based Creative Process Analysis Across AI Design Tools.*

WORK EXPERIENCE

2021 – Present
Researcher, Design Informatics Lab, Hanyang University
Conducted AI in Design research on designer-intent-based design support, preference modeling, generative AI for 3D/visual design exploration, and computational analysis of design behavior. Contributed to leading and writing the KEIT Design Technology R&D proposal on designer-intent-based AI design implementation technology, including a designer-in-the-loop agentic pipeline and consortium coordination for a KRW 11.3B project.

Jul 2019 – Aug 2019
Computational Design Intern, HS HI-TECH (3D Pryiol)
Field application of sand-based concrete 3D-printing to architectural fabrication.

TEACHING

Mar 2025 – Jun 2025
Teaching Fellow — Design Computing (HOM4025), Hanyang University
Designed and led modules on data-driven design methods and preference-guided 3D generative AI using genetic algorithms for latent-space exploration.

Sep 2024 – Dec 2024
Teaching Fellow — Drawing and AI Visualization (HEC3007), Hanyang University
Taught generative-AI tooling for interior architecture and pipeline-level integration of AI techniques into design workflows.

HONORS & AWARDS

Nov 2019
Grand Prize (대상), 6th Capstone Design Competition, Korea Concrete Institute
Awarded for *Concrete Omnidirectional Speaker*, integrating acoustic optimization with UHPC-based 3D-printed concrete (team submission).

CERTIFICATIONS

- Engineer Architecture (건축기사) — Human Resources Development Service of Korea (HRDK), 2020.