Jin-Seop Lee

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Contact Information

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Links: [Google Scholar] | [LinkedIn]

Research Interests

I pursue my research with a guiding belief: "**AI must be of humans, by humans, and for humans.**" My research focuses on **cooperative and social intelligence**, enabling AI agents to understand and cooperate with others, improve through experience, and navigate complex social interactions. My current research interests include:

- **Cooperative and Social Intelligence:** Theory of Mind for Cooperation, Self-Improving Cooperative Agents, Social Intelligence in Multi-Agent Systems.
- **Human-Centered AI:** Human-Centered AI Agents, Personal World Models, Proactive AI, Proactive Procedural Assistance, Personalized Assistance.
- **Self-Evolving AI:** Planner Evolution, Planner–Policy Co-evolution, Continual Learning, Learning from Feedback.
- **Video Understanding:** Video Temporal Grounding, Fine-grained Video Understanding, Streaming Video Understanding, Hierarchical Procedural Understanding.
- **Self-supervised Learning:** Representation learning with limited supervision, World Model.
- **Data-efficient Learning:** Semi- and weakly supervised learning, Learning with Noisy Labels, robust learning, and domain generalization.

Research Experience

Visiting PhD Student, New York University, USA — Oct 2026 - Dec 2026
- Mentor: Prof. Mengye Ren
- Project: "Cooperative and Social Intelligence"

Visiting PhD Student, Nanyang Technological University, Singapore — Dec 2025 - Feb 2026
- Mentors: Prof. Jaehong Yoon and Prof. Boyang Albert Li
- Project: "Improving Proactive AI Assistance with Hierarchical Procedural Understanding"

Education

Sungkyunkwan University, South Korea

Ph.D. Student, Department of Artificial Intelligence — Mar 2021 - Aug 2027
- Advisor: Prof. Jee-Hyong Lee
- Co-advisor: Prof. JinYeong Bak

Sungkyunkwan University, South Korea

B.S., Department of Mechanical Engineering — Mar 2015 - Feb 2021
- Double major: Department of Computer Engineering

Incheon Science High School, South Korea — Mar 2013 - Feb 2015

Recent Preprints

[P1] Improving Proactive AI Assistance with Hierarchical Procedural Understanding
Jin-Seop Lee, TaeYeon Won, SeongJun Jung, JungHoon Kim, Boyang Albert Li, Jin-Young Park, Jaehong Yoon‡, Jee-Hyong Lee‡
Preprint, 2026

Conference Publications

**: equal contribution; ‡: corresponding author*

[C15] CountCluster: Training-Free Object Quantity Guidance with Cross-Attention Map Clustering for Text-to-Image Generation
Joohyeon Lee*, **Jin-Seop Lee***, Jee-Hyong Lee‡
IEEE/CVF Winter Conference on Applications of Computer Vision (WACV), 2027

[C14] InterventionBench: Can LLM Agents Adapt to Mid-task User Interventions?
Jaehoon Lee, Suyoung Bae, **Jin-Seop Lee**, YunSeok Choi‡, Jee-Hyong Lee‡
Findings of EMNLP 2026. ***Outstanding Paper Award at the KAIA 2026***

[C13] EXPO-SQL: Execution-based Clause-level Policy Optimization for Text-to-SQL
Jaehoon Lee, CheolWon Na, Suyoung Bae, **Jin-Seop Lee**, Jihyung Lee, YunSeok Choi‡, Jee-Hyong Lee‡
Findings of ACL 2026

[C12] Learning to Refuse: Refusal-Aware Reinforcement Fine-Tuning for Hard-Irrelevant Queries in Video Temporal Grounding
Jin-Seop Lee*, SungJoon Lee*, SeongJun Jung, Boyang Li, Jee-Hyong Lee‡
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2026. CVPR Compute Transparency Champion (0.4%)

[C11] BD-Net: Has depth-wise convolution ever been applied in Binary Neural Networks?
DoYoung Kim, **Jin-Seop Lee**, Noo-ri Kim, SungJoon Lee, Jee-Hyong Lee‡
AAAI Conference on Artificial Intelligence (AAAI), 2026

[C10] TAG: A Simple Yet Effective Temporal-Aware Approach for Zero-Shot Video Temporal Grounding
Jin-Seop Lee*, Sungjoon Lee*, Jaehan Ahn, Yunseok Choi, Jee-Hyong Lee‡
British Machine Vision Conference (BMVC), 2025

[C9] Stabilizing Open-Set Test-Time Adaptation via Primary-Auxiliary Filtering and Knowledge-Integrated Prediction
Byung-Joon Lee, **Jin-Seop Lee**, Jee-Hyong Lee‡
British Machine Vision Conference (BMVC), 2025

[C8] DCG-SQL: Enhancing In-Context Learning for Text-to-SQL with Deep Contextual Schema Link Graph
Jihyung Lee*, **Jin-Seop Lee***, Jaehoon Lee, YunSeok Choi‡, Jee-Hyong Lee‡
Annual Meeting of the Association for Computational Linguistics (ACL), 2025

[C7] DomCLP: Domain-wise Contrastive Learning with Prototype Mixup for Unsupervised Domain Generalization
Jin-Seop Lee, Noo-ri Kim, Jee-Hyong Lee‡
AAAI Conference on Artificial Intelligence (AAAI), 2025

Conference Publications

(continued)

[C6] Feature-level and Spatial-level Activation Expansion for Weakly-Supervised Semantic Segmentation
Junsu Choi*, **Jin-Seop Lee***, Noo-ri Kim, SuHyun Yoon, Jee-Hyong Lee‡
IEEE/CVF Winter Conference on Applications of Computer Vision (WACV), 2025

[C5] CAFTTA: Mitigating Unseen Class Forgetting in Test-Time Adaptation with Knowledge Fusion
Byung-Joon Lee, **Jin-Seop Lee**, Jee-Hyong Lee‡
SCIS & ISIS, 2024

[C4] IGNORE: Information Gap-based False Negative Loss Rejection for Single Positive Multi-Label Learning
Gyeong Ryeol Song, Noo-ri Kim, **Jin-Seop Lee**, Jee-Hyong Lee‡
European Conference on Computer Vision (ECCV), 2024

[C3] ExMatch: Semi-Supervised Learning with Scarce Labeled Samples with Additional Exploitation of Unlabeled Samples
Noo-ri Kim, **Jin-Seop Lee**, Jee-Hyong Lee‡
European Conference on Computer Vision (ECCV), 2024

[C2] Learning with Structural Labels in Learning with Noisy Labels
Noo-ri Kim*, **Jin-Seop Lee***, Jee-Hyong Lee‡
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2024

[C1] Class Activation Map Pairing for Adversarial Robustness
DongEon Jeong, MinKyu Lee, **Jin-Seop Lee**, Jee-Hyong Lee‡
ICCC, 2020

Journal Publications

[J2] Automation of Trimming Die Design Inspection by Zigzag Process Between AI and CAD Domains
Jin-Seop Lee*, Tae-Hyun Kim*, Sang-Hwan Jeon, Sung-Hyun Park, Sang-Hi Kim, Eun-Ho Lee‡, Jee-Hyong Lee‡
Engineering Applications of Artificial Intelligence, 2024

[J1] Automatic defect classification using semi-supervised learning with defect localization
Yusung Kim, **Jin-Seop Lee**, Jee-Hyong Lee‡
IEEE Transactions on Semiconductor Manufacturing, 2023

Domestic Publications

[D8] Training-Free Unconditional-Boosted Guidance Scheduling for Long-Tailed Diffusion Models
Hyun Sir Ihm, **Jin-Seop Lee**, Jee-Hyong Lee‡
CKAIA, 2025

[D7] Optimization of Stable Diffusion Based on Cross Attention Map Analysis
Jung Hoon Kim, **Jin-Seop Lee**, YongHoon Kang, Jee-Hyong Lee‡
KIIS Autumn Conference, 2024

[D6] Fast and Effective Inference Approach in Diffusion-based Image Inpainting without Additional Training
Hyun Sir Ihm, **Jin-Seop Lee**, Jee-Hyong Lee‡
KIIS Autumn Conference, 2024

[D5] Missing Modality Reconstruction Method via Similarity Search
Heejae Yang, Jaehoon Lee, **Jin-Seop Lee**, Jee-Hyong Lee‡
KIIS Spring Conference, 2024

[D4] Multi Label Classification Loss Re-Weighting Considering the Distribution of Class-Imbalance Datasets
Gyeong-Yeol Song, **Jin-Seop Lee**, Suhyeon Yoon, Jee-Hyong Lee‡
KIIS Conference, 2022

[D3] Diffusion-based generative model study for class-imbalance mitigation
Hyeon-Min Jang, **Jin-Seop Lee**, Jee-Hyong Lee
Journal of KIIS, 2022

[D2] Generating Pseudo-Clean-Label based on Loss Function for Noisy Label
Suhyeon Yoon, **Jin-Seop Lee**, Jee-Hyong Lee‡
KIIS Conference, 2021

[D1] A Study on Teacher Assisted Attention Transfer to Improve Knowledge Distillation Performance
Jin-Seop Lee, Seok-Kyu Kang, Ho-yong Seo, Jee-Hyong Lee‡
KIIS Conference, 2020

Patents

Neural network model training method and apparatus
Jee Hyong Lee, **Jin-Seop Lee**, Dong Eon Jeong
U.S. Patent No. 12,645,935 B2, Jun 2026.

Side outer extraction system and method
SungHyun Park, Sang Hwan Jun, Jee-Hyong Lee, Eun-Ho Lee, Tae-Hyun Kim, **Jin-Seop Lee**
U.S. Patent No. 12,499,556 B2, Dec 2025.

Advising Experience

Mentor Mentored 14 MS and PhD students at SKKU (2022–Present)

- **SeongJun Jung** (Fall 2025–Present), MS student at SKKU.
- **TaeYeon Won** (Fall 2025–Present), MS student at SKKU.
- **SungJoon Lee** (Fall 2024–Present), MS → PhD student at SKKU, Co-authored [C10, C12].
- **Jaehoon Lee** (Fall 2024–Present), MS → PhD student at SKKU, Co-authored [C13, C14].
- **Jihyung Lee** (Fall 2024–Present), MS → PhD student at SKKU, Co-authored [C8].
- **Hyun Sir Ihm** (Spring 2025–Present), MS student at SKKU, Co-authored [D6, D8].
- **JungHoon Kim** (Spring 2025–Present), MS → PhD student at SKKU, Co-authored [D7].
- **Joohyeon Lee** (Spring 2024–Fall 2026), MS student at SKKU → Samsung Electronics, Co-authored [C15].
- **DoYoung Kim** (Spring 2024–Winter 2025), MS → PhD student at SKKU, Co-authored [C11].
- **Byung-Joon Lee** (Spring 2024–Summer 2025), MS student at SKKU → NURIMEDIA, Co-authored [C5, C9].
- **Junsu Choi** (Spring 2023–Winter 2024), MS student at SKKU → Samsung Electronics, Co-authored [C6].
- **Gyeong Ryeol Song** (Spring 2023–Winter 2024), MS student at SKKU → Samsung Electronics, Co-authored [C4, D4].
- **Hyeon-Min Jang** (Spring 2023–Winter 2024), MS student at SKKU → Samsung Electronics, Co-authored [D3].
- **SuHyun Yoon** (Spring 2022–Winter 2023), MS student at SKKU → Hyundai Motors, Co-authored [D2].

Professional Services

Conference and journal reviewer

CVPR (2024-), ICCV (2025-), ECCV (2024-), WACV (2024-), BMVC (2025-), AAAI (2025-), ARR (2025-), NeurIPS (2026-), ICML (2026-), ICLR (2026-), ACM SAC (2024-).

International Journal of Computer Vision (2026-).

Teaching Activities

NVIDIA DLI Ambassador — Jul 2021 - Present
- Conducted training workshops and K-Digital Training Programs with Fast Campus, Alice, Hancom Academy, Leaders Systems, and NVIDIA.
- Generative AI with Diffusion Model (Instructor)
- Fundamentals of Deep Learning (Instructor)
- Building Conversational AI Applications
- Building Transformer-Based Natural Language Processing Applications
- Fundamentals of Deep Learning for Multi-GPUs
- Getting Started with Deep Learning
- Fundamentals of Accelerated Computing with CUDA C/C++

Korea-Massive Open Online Course (K-MOOC) — 2020 - 2023
- Teaching Assistant

Awards & Honors

Outstanding Paper Award, KAIA Summer Annual Conference — Aug 2026
- Paper: "InterventionBench: Can LLM Agents Adapt to Mid-task User Interventions?"

CVPR Compute Transparency Champion, 2026 (0.4%) — Jun 2026
- Recognition for transparent compute reporting and research contribution

NRF Ph.D. Fellowship, National Research Foundation of Korea — Sep 2025 - Aug 2027
- Title: Development Core Technology for Efficient Reasoning of Multimodal Generative AI Models
- Fellowship amount: US$35k

Outstanding Student Scholarship — Mar 2021 - Present
- Half scholarship, SKKU (US$15k)

Dean's List, SKKU — 2020
- Award for excellent academic performance

Science Talent Scholarship, SKKU — Mar 2015 - Feb 2021
- Full scholarship (US$28k)

Korea Olympiad in Chemistry, 5th prize — 2012

Korea Olympiad in Informatics, 3rd prize — 2009

Baduk (Go), amateur 1st degree — 2004

Talks

SKKU AI Doctoral Colloquium — Dec 2025
- "Robust and Generalized Learning in Real-world Scenarios"

Open Seminar at Samsung Research — Sep 2025
- "Developing Video Temporal Grounding with Multimodal Query Understanding"