Sejin Kim

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EDUCATION

Mar. 2017 ~ Feb. 2023	**Korea Advanced Institute of Science and Technology** School of Computing	Daejeon, Korea
	Thesis: Region-Level Spatio-Temporal Prediction Based on Transfer Learning for Data-Poor Cities *Advisor: Jae-Gil Lee*	
	Ph.D. in Computer Science	
Sep. 2013 ~ Aug. 2016	**Korea Advanced Institute of Science and Technology** School of Computing	Daejeon, Korea
	Thesis: Design and implementation of cost-based query optimization for Odysseus/OOSQL *Advisor: Kyu-Young Whang*	
	M.S. in Computer Science	
Mar. 2009 ~ Aug. 2013	**Korea Advanced Institute of Science and Technology** School of Computing	Daejeon, Korea
	B.S. in Computer Science	

RESEARCH EXPERIENCES

- Postdoctoral Researcher at AI Graduate School, Gwangju Institute of Science and Technology, Korea (Apr. 2023 ~ Present)

- Researcher at GraphAI Research, GraphAI Co. Ltd., Korea (Feb. 2023 ~ Mar. 2023)

- Researcher at Advanced Information Technology Research Center, Korea Institute of Science and Technology, Korea (Sep. 2016 ~ Feb. 2017)

WORKING EXPERIENCE

- **GIST AI Graduate School** - Postdoctoral Researcher, Apr. 2023 - Present

- **WITLab** - Lecturer for Korea Olympiad in Informatics (KOI), Mar. 2017 - Feb. 2023

- **GraphAI Labs** - AI Reseracher, Feb. 2023 - Mar. 2023

- **KAIST AITRC** - DB Researcher, Sep. 2016 - Aug. 2017

RESEARCH INTERESTS

- Human-like AI
- Artificial general intelligence
- Reinforcement learning
- Program synthesis

CONFERENCE

1. **Kim, S.**[*], Kim, S.[†], (2026), "System 2 Reasoning for Human–AI Alignment: Generality and Adaptivity via ARC-AGI", AAAI AI Alignment Track. (*submitted*)

2. Liyew, W.[*], Lee, S., **Kim, S.**[†], Kim, S.[†], (2026), "Evolving and Refining Code: A Neuro-Evolutionary Program Synthesis for Compositional Reasoning", AAAI. (*submitted*)

3. Jeon, J.[*], Shim, S., **Kim, S.**, Kim, S., Lee, B.[†], (2026), "Neural MCTS with LLM Guidance for Effective Program Synthesis on Abstraction and Reasoning Corpus", AAAI. (*submitted*)

4. **Kim, S.**[*], Choi, H., Lee, S., Kim, S.[†], "ARCTraj: A Dataset and Benchmark of Human Reasoning Trajectories for Abstract Problem Solving", KDD Datasets and Benchmarks Track. (*submitted*)

5. Cho, G.[*], Im, J., Lee, J., Yi, H., **Kim, S.**[†], Kim, S.[†], "TRACED: Transition-aware Regret Approximation with Co-learnability for Environment Design", NeurIPS. (*submitted*)

6. **Kim, S.**[*], Lee, H., Kim, S.[†], (2025), "Addressing and Visualizing Misalignments in Human Task-Solving Trajectories", KDD. *(top conference, acceptance rate: 18.4%)*

7. **Kim, S.**[*], Lee, H., Kim, S.[†], (2025), "Addressing and Visualizing Misalignments in Human Task-Solving Trajectories", ICLR Bi-Align Workshop.

8. **Kim, S.**[*], Kim, S.[†], (2024), "System-2 Reasoning via Generality and Adaptation", NeurIPS S2R Workshop.

9. Lee, S.[*], Sim, W.[*], Shin, D., **Kim, S.**, Kim, S.[†], (2024), "Reasoning Abilities of Large Language Models through the Lens of Abstraction and Reasoning", NeurIPS S2R Workshop.

10. Lee, J.[*], Sim, W.[*], **Kim, S.**[†], Kim, S.[†] (2024), "Enhancing Analogical Reasoning in the Abstraction and Reasoning Corpus via Model-Based RL", IJCAI IARML Workshop.

11. Shim, S.[*], Ko, D.[*], Lee, H., Lee, S., Song, D., Hwang, S., **Kim, S.**, Kim, S.[†], (2024), "O2ARC 3.0: A Platform for Solving and Creating ARC Tasks", IJCAI Demo.

12. Lee, H.[*], **Kim, S.**[*], Lee, S., Hwang, S., Lee, J., Lee, B.[†], Kim, S.[†], (2024), "ARCLE: The Abstraction and Reasoning Corpus Learning Environment for Reinforcement Learning", CoLLAs.

13. Park, J.[*], Im, J.[*], Hwang, S.[*], Lim, M.[*], Ualibekova, S., **Kim, S.**, Kim, S.[†], (2023), "Unraveling the ARC Puzzle: Mimicking Human Solutions with Object-Centric Decision Transformer", ICML ILHF Workshop.

14. Kim, S.[*], Song, H., **Kim, S.**, Lee, J.-G.[†], (2020), "Revisit Prediction by Deep Survival Analysis", PAKDD.

15. Yea, S.-G.[*], **Kim, S.**, TO, J.-M., Lee, J.-G.[†], (2016), "SentiWorld: Understanding Emotions between Countries Based on Tweets", ICWSM Demo.

JOURNAL

1. Hwang, S.[*], Lee, S., **Kim, S.**[†], Kim, S.[†], "Solution Augmentation for ARC Problems Using GFlowNet: A Probabilistic Exploration Approach", Transactions on Machine Learning Research, (*under review*)

2. Lee, S.[*], Sim, W.[*], Shin, D., Hwang, S., Seo, W., Park, J., Lee, S., **Kim, S.**, Kim, S.[†], (2025), "Reasoning Abilities of Large Language Models: In-Depth Analysis on the Abstraction and

Reasoning Corpus", *ACM Transactions on Intelligent Systems and Technology. (Just Accepted)*

3. Whang, K.-Y.*, Na, I., Yun, T.-S., Park, J.-A., Cho, K.-H., **Kim, S.**, Yi, I., Lee, B.-S., (2020), "Building Social Networking Services Systems using the Relational Shared-Nothing Parallel DBMS", *Data & Knowledge Engineering,* 125, 101756.

PREPRINT

1. Kim, Y.*, Park, J., Kim, H., **Kim, S.**, Lee, B., Kim, S.†, (2024), "Diffusion-Based Offline RL for Improved Decision-Making in Augmented ARC Task", arXiv:2410.11324

2. Park, J.*, Kim, Y., **Kim, S.**, Lee, B.J., Kim, S.†, (2024), "DIAR: Diffusion-model-guided Implicit Q-learning with Adaptive Revaluation", arXiv:2410.11338

CONFERENCE (DOMESTIC)

1. Lee. J.*, Lee. S., **Kim, S.**†, Kim, S.†, (2023), "Extracting the Core Knowledge of ARC with the World Model", Korea Software Congress.

2. Gu, G.*, Sim, W., Im, J., **Kim, S.**, Kim, S.†, (2023), "Using Contrastive Learning for Abstraction and Reasoning Task", Korea Software Congress.

3. Lee. H.*, **Kim, S.**, Kim, S.†, (2023), "ARCLE: Gymnasium Environment for Abstraction and Reasoning Corpus", Korea Software Congress.

4. Park., J.*, Im., J., Lee, Y., Shin, D., **Kim, S.**, Kim, S.†, (2023), "Abstraction and Reasoning Challenge with Decision Transformer", Korea Computer Congress.

5. Sim, W.*, Jin, H., **Kim, S.**, Kim, S.†, (2023), "The Possibility of Prompt Engineering for ARC Problem Solving", Korea Computer Congress.

6. Shin, Y.*, Park, D., Kang, J., **Kim, S.**†, (2022), "Contrastive Learning with Segment Supervision for Semi-Supervised Time Series Classification", Korea Software Congress.

7. Kim, B.*, Na, J., Byun, Y., **Kim, S.**, Lee., J.-G.†, (2022), "Autoencoder ODEs for Time Series Anomaly Detection", Korea Software Congress.

8. Kim, J.*, Kim, D., **Kim, S.**, Kang, J., Park, D., Lee., J.-G.†, (2022), "Performance Comparison of Self-Driving Models With and Without LIDAR Sensors Based on Reinforcement Learning in AWS DeepRacer Platform ", Korea Computer Congress.

9. Trirat, P.*, Shin, Y., **Kim, S.**†, Kim, M.†, (2021), "Generating a Machine Learning Model with a Few Sentences", Korea Software Congress.

10. Kim, B.*, Kim, S., **Kim, S.**, Lee, J.-G.†, (2019), "Customer Revisit Prediction Using Macroscale Mobility Information", Korea Software Congress.

11. **Kim, S.***, (2018), "A Comparison of Implementation Method of Spatial Operator in Spatial OLAP ", Korea Computer Congress.

JOURNAL (DOMESTIC)

1. Sim, W.*, Jin, H., **Kim, S.**, Kim, S.†, (2024), "The Possibility of Prompt Engineering for ARC Problem Solving", KIISE Transactions on Computing Practices.

PATENTS

1. Lee, J.-G., Lee, C., Kim, J., **Kim, S.**, "Retrieval System for Geosocial Networks and Method of the Same", KR-Registration No. 10-2055900-0000

2. Lee, H., **Kim, S.**, Kim, S., "Method and System for Implementing a Reinforcement Learning

Environment Capable of Solving Abstraction and Reasoning Challenge", KR-Application No. 10-2024-0101165

AWARDS & HONORS

- **Outstanding Reviewer**, KDD 2025
  Selected as a Top 10% reviewer for the ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD), 2025.

- **Postdoctoral Fellowship Recipient**, NRF
  Awarded a competitive 2-year fellowship for the project Developing Abstraction and Reasoning Capability for AI Model as Principal Investigator, National Research Foundation of Korea, Sept 2024 - Aug 2026.

- **Excellence Award**, GIST
  Recognized for outstanding research achievements among postdoctoral researchers, Gwangju Institute of Science and Technology, Korea, 2024.

TEACHING ASSISTANT

- CS101 **Introduction to Programming**, School of Computing, KAIST
- CS360 **Introduction to Databases**, School of Computing, KAIST
- CS560 **Database Systems**, School of Computing, KAIST
- CS664 **Advanced Database Systems**, School of Computing, KAIST
- KSE525 **Data Mining and Knowledge Discovery**, Dept. of Knowledge Service Engineering, KAIST
- KSE625 **Analytical Methodologies for Big Data**, Dept. of Knowledge Service Engineering, KAIST