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Junhyung Ahn

Ph.D. in Information Sciences • University of Illinois Urbana–Champaign (UIUC)

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RESEARCH INTERESTS

Causal inference; Agentic AI; Robust machine learning.

EDUCATION

University of Illinois Urbana–Champaign (UIUC) Aug. 2026 – Present
Ph.D. in Information Sciences
Advisor: Prof. Yonghan Jung

Korea Advanced Institute of Science and Technology (KAIST) Feb. 2019 – Feb. 2022
M.S. in Electrical Engineering
Advisor: Prof. Changho Suh
Thesis: Leveraging Hierarchical Similarity Graphs for Matrix Completion

Korea Advanced Institute of Science and Technology (KAIST) Mar. 2015 – Feb. 2019
B.S. in Electrical Engineering
Magna Cum Laude (GPA 3.93/4.3)

PUBLICATIONS

PREPRINT

1. **Junhyung Ahn**. "AGORA: Reliability-Aware Aggregation of LLM Judges via Item-Response Theory." *In preparation*.

PEER-REVIEWED

1. **Junhyung Ahn** and Sanghack Lee. "On Predicting Post-Click Conversion Rate via Counterfactual Inference." *IEEE International Conference on Data Mining (ICDM)*, 2025. **Best Paper Award Finalist**

2. **Junhyung Ahn**, Adel Elmahdy, Soheil Mohajer, and Changho Suh. "On the Fundamental Limits of Matrix Completion: Leveraging Hierarchical Similarity Graphs." *IEEE Transactions on Information Theory*, 70(3):2039–2075, 2024.

3. Adel Elmahdy*, **Junhyung Ahn***, Soheil Mohajer, and Changho Suh. "The Optimal Sample Complexity of Matrix Completion with Hierarchical Similarity Graphs." *IEEE International Symposium on Information Theory (ISIT)*, pp. 2409–2414, 2022.

4. Adel Elmahdy*, **Junhyung Ahn***, Changho Suh, and Soheil Mohajer. "Matrix Completion with Hierarchical Graph Side Information." *Conference on Neural Information Processing Systems (NeurIPS)*, pp. 9061–9074, 2020.

(* equal contribution.)

RESEARCH EXPERIENCE

Graduate Research Assistant, Causal Science Lab — Aug. 2026 – Present
UIUC • Champaign, IL, USA

- Developing information-theoretic bounds on causal effects under unmeasured confounding, where the confounding budget is identified from the propensity score alone, without external sensitivity parameters.

AI Engineer, Agent Flow Modeling Team — Aug. 2025 – Aug. 2026
NAVER • Seongnam, Republic of Korea

- Developed off-policy evaluation methods for deterministic eCPM-based ranking policies in online ad auctions, using kernel-based relaxation to reduce variance in importance-sampling estimators.
- Designed an LLM-as-a-Judge framework for AI-generated search responses that aggregates multiple judges with an item-response-theory model, learning each judge's reliability without human labels (*manuscript in preparation for submission*).

Machine Learning Engineer, Artificial Intelligence Team — Mar. 2022 – May 2025
Dable • Seoul, Republic of Korea

- Proposed a causal-inference approach to conversion-rate (CVR) prediction that imputes conversion labels for non-clicked samples via counterfactual inference, mitigating selection bias under low conversion rates (*IEEE ICDM*).
- Addressed data scarcity with multi-task and self-supervised learning (feature-embedding augmentation, contrastive objectives) to improve CVR estimation under data-limited conditions.

Graduate Researcher, Information Systems Lab — Feb. 2019 – Feb. 2022
KAIST • Daejeon, Republic of Korea

- Characterized the information-theoretic limit on observed entries required for perfect matrix recovery, and designed an efficient algorithm using hierarchical social-similarity graphs as side information to address the cold-start problem (*NeurIPS*, *ISIT*, *IEEE Trans. Inf. Theory*).
- Built a deep retrieval system for chest-disease prediction (collaboration with Samsung Medical Center), classifying 14 disease types with semantically meaningful feature representations.

HONORS & AWARDS

- Best Paper Award Finalist, IEEE ICDM — 2025
- Magna Cum Laude, KAIST — 2019
- KAIST Support Scholarship — 2019–2020
- KAIST Support Scholarship — 2015–2018
- National Science & Technology Scholarship — 2015–2018

TEACHING EXPERIENCE

Instructor, Industry AI Courses — Aug. 2019 – Dec. 2021
Taught applied machine-learning courses for industry engineers (Samsung, SK Hynix, Hyundai Motor, Seongnam–KAIST program).

Teaching Assistant — Sep. 2019 – Aug. 2020
Wireless Communication Systems (EE321) and Introduction to Electronics Design Lab (EE305).