Jiin Woo

Ph.D. Candidate at Carnegie Mellon University

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Education

Carnegie Mellon University (CMU) — *Pittsburgh, PA, USA*

Ph.D. in Electrical & Computer Engineering — *Aug. 2021 - May. 2026 (expected)*

- Advisors: Yuejie Chi and Gauri Joshi

Korea Advanced Institute of Science and Technology (KAIST) — *Daejeon, South Korea*

M.S. in Electrical Engineering — *Sep. 2016 - Aug. 2018*

- Advisor: Yung Yi

Korea Advanced Institute of Science and Technology (KAIST) — *Daejeon, South Korea*

B.S. in Mathematical Sciences — *Feb. 2011 - Aug. 2016*

Work Experience

Amazon — *Seattle, WA, USA*

Applied Scientist Intern — *May. 2024 - Aug. 2024*

- Worked on LLM-enhanced RL for recommendation systems.

NAVER Search — *Seongnam, South Korea*

Machine Learning Engineer — *Sep. 2018 - Aug. 2021*

- Developed a query representation model to identify long-tail query intent, enhanced with a regularized BERT fine-tuning.
- Worked on a personalized keyword recommendation algorithm with contextual multi-armed bandit and Bradley-Terry model.
- Developed a transformer-based user behavior representation, facilitating user satisfaction prediction and user click prediction.

Selected Publications

Preprints

[P2] Large Language Model-Enhanced Reinforcement Learning for Diverse and Novel Recommendations

Jiin Woo, Alireza Bagheri Garakani, Tianchen Zhou, Zhishen Huang, Yan Gao

Under review

[P1] The Blessing of Heterogeneity in Federated Q-Learning: Linear Speedup and Beyond

Jiin Woo, Gauri Joshi, Yuejie Chi

Under review

Conferences

[C4] Federated Offline Reinforcement Learning: Collaborative Single-Policy Coverage Suffices — *Vienna, Austria*

Jiin Woo, Laixi Shi, Gauri Joshi, Yuejie Chi

International Conference on Machine Learning (ICML), 2024

[C3] The Blessing of Heterogeneity in Federated Q-Learning: Linear Speedup and Beyond — *Honolulu, HI, USA*

Jiin Woo, Gauri Joshi, Yuejie Chi

International Conference on Machine Learning (ICML), 2023

[C2] Iterative Learning of Graph Connectivity from Partially-Observed Cascade Samples *Online*
Jiin Woo, Jungseul Ok, Yung Yi
ACM MobiHoc, 2020

[C1] Rumor Source Detection under Querying with Untruthful Answers *Atlanta, GA, USA*
Jaeyoung Choi, Sangwoo Moon, Jiin Woo, KyungHwan Son, Jinwoo Shin, Yung Yi
IEEE INFOCOM, 2017

Journals

[J1] Information Source Finding in Networks: Querying With Budgets
Jaeyoung Choi, Sangwoo Moon, Jiin Woo, KyungHwan Son, Jinwoo Shin, Yung Yi
IEEE/ACM Transactions on Networking, 2020

Research Experience

Yuejie Chi Group and Optimization Probability and Learning (OPAL) Lab, CMU *Aug. 2021 - Present*
Graduate Researcher (Advisors: Yuejie Chi and Gauri Joshi)

- Developed collaborative reinforcement learning algorithms that reduce uncertainty by integrating diverse data and models.
- Developed provably efficient reinforcement learning algorithms in federated settings.

LeArning in Networking: Algorithm, Design, and Analysis (LANADA) Lab, KAIST *Sep. 2016 - Aug. 2018*
Graduate Researcher (Advisor: Yung Yi)

- Proposed a graph structure inference algorithm using partially observed social network datasets.
- Analyzed a rumor source localization algorithm with active querying.
- Developed a lightweight deep Q-network (DQN) structure via parameter sharing based on the symmetricity of environments.

Algorithmic Intelligence Laboratory (ALIN-LAB), KAIST *Jun. 2015 - Dec. 2015*
Undergraduate Intern (Advisor: Jinwoo Shin)

- Studied the principles of graphical models. Focused on variational methods in parameter estimation.

Artificial Intelligence & Probabilistic Reasoning Laboratory (AIPR-LAB), KAIST *Jan. 2015 - May. 2015*
Undergraduate Intern (Advisor: Kee-Eung Kim)

- Studied and implemented kernel-based reinforcement learning methods.

Teaching Experience

Introduction to ML for Engineers (18-461/18-661) *Fall 2024*
Teaching Assistant, Carnegie Mellon University (CMU)

Special Topics in Artificial Intelligence: Foundations of Reinforcement Learning (18-813B) *Spring 2023*
Teaching Assistant, Carnegie Mellon University (CMU)

Data Structures and Algorithms for Electrical Engineering (EE205) *Fall 2017*
Teaching Assistant, Korea Advanced Institute of Science and Technology (KAIST)

Calculus 1, 2 (MAS101, MAS102) *Fall 2016, Fall 2017*
Tutor, Korea Advanced Institute of Science and Technology (KAIST)

EE Co-op Program (Field Training and Education Program) *Spring 2017*
Teaching Assistant, Korea Advanced Institute of Science and Technology (KAIST)

Honors & Awards

Hsu Chang Memorial Fellowship *USA*
Electrical and Computer Engineering Department at Carnegie Mellon University (CMU) *2022-2023*

Carnegie Institute of Technology Dean's Fellowship *USA*
Carnegie Institute of Technology at Carnegie Mellon University (CMU) *2021-2022*

KAIST Support Scholarship *South Korea*
Korea Advanced Institute of Science and Technology (KAIST) *Fall 2016 - Spring 2018*

Excellence Award in Creative Challenge Type SW R&D Program *South Korea*
Korea IT Business Promotion Association (IPA) *Nov. 2015*

The National Scholarship for Science and Engineering *South Korea*
Korea Student Aid Foundation (KOSAF) *Spring 2011 - Spring 2015*

Relevant Coursework

Machine Learning	Distributed and Federated Learning Algorithms, Advanced Introduction to Machine Learning, Convex Optimization, Information Theory, Fundamentals of Machine Learning
Statistics/Math	Intermediate Statistics, Mathematical Statistics, Graph Theory, Lebesgue Integral Theory, Logic and Set Theory, Analysis, Discrete Mathematics, Probability and Statistics, Linear Algebra
Programming/Systems	Operating Systems and System Programming for Electrical Engineering, System Programming, Data structure, Computer Network

Skills

Programming	Python, MATLAB, C, Java
ML, Data Science	Pytorch, Spark, Hive, Hadoop
Others	HTML, CSS, Javascript

Academic Services

Reviewer	NeurIPS (2023), ICLR (2024), ICML (2024), TMLR (2024)