Yongho Shin

Postdoctoral researcher
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Research Interests

Online/approximation algorithms for combinatorial optimization problems

Education

Ph.D. in Computer Science, Yonsei University, South Korea Mar. 2018 – Aug. 2024

- ◇ Dissertation topic: Relaxing hard requirements of online optimization via learning augmentation and limited revocability
- ◇ Advisor: Hyung-Chan An

B.S. in Computer Science, Yonsei University, South Korea Mar. 2012 – Feb. 2018

- ◇ Awarded *high honors at graduation*

Employment

Institute of Computer Science, University of Wrocław, Poland Nov. 2024 – present

- ◇ Postdoctoral researcher
- ◇ Advisor: Jarosław Byrka

Research Papers

Fateme Abbasi, Hyung-Chan An, Jarosław Byrka, Changyeol Lee, and **Yongho Shin**. Chromatic correlation clustering via cluster LP. *arXiv preprint arXiv:2510.13446*, 2025.

Yongho Shin, Changyeol Lee, Gukryeol Lee, and Hyung-Chan An. Improved learning-augmented algorithms for the multi-option ski rental problem via best-possible competitive analysis. *ACM Transactions on Algorithms*, 2025.

Jarosław Byrka and **Yongho Shin**. Online rounding for set cover under subset arrivals. *arXiv preprint arXiv:2507.13159*, 2025.

Davin Choo, Billy Jin, and **Yongho Shin**. Learning-augmented online bipartite fractional matching. *arXiv preprint arXiv:2505.19252*, 2025. **To appear in NeurIPS 2025.**

Changyeol Lee, **Yongho Shin**, and Hyung-Chan An. Improved algorithms for overlapping and robust clustering of edge-colored hypergraphs: An LP-based combinatorial approach. *arXiv preprint arXiv:2505.18043*, 2025. **To appear in NeurIPS 2025.**

Yongho Shin, Changyeol Lee, and Hyung-Chan An. On optimal consistency-robustness trade-off for learning-augmented multi-option ski rental. *arXiv preprint arXiv:2312.02547*, 2023.

Yongho Shin, Changyeol Lee, Gukryeol Lee, and Hyung-Chan An. Improved learning-augmented algorithms for the multi-option ski rental problem via best-possible competitive analysis. In *Proceedings of the 40th International Conference on Machine Learning (ICML 2023)*, PMLR 202:31539-31561, 2023.

Kangsan Kim, **Yongho Shin**, and Hyung-Chan An. Constant-factor approximation algorithms for parity-constrained facility location and k-center. *Algorithmica 85*, 1883–1911, 2023.

Yongho Shin and Hyung-Chan An. Making three out of two: Three-way online correlated selection. In *Proceedings of the 32nd International Symposium on Algorithms and Computation (ISAAC 2021)*, 49:1-49:17, 2021.

Kangsan Kim, **Yongho Shin**, and Hyung-Chan An. Constant-factor approximation algorithms for the parity-constrained facility location problem. In *Proceedings of the 31st International Symposium on Algorithms and Computation (ISAAC 2020)*, 21:1-21:17, 2020.

Yongho Shin, Kangsan Kim, Seungmin Lee, and Hyung-Chan An. Online graph matching problem with a worst-case reassignment budget. *arXiv preprint arXiv:2003.05175*, 2020.

Awards

High honors at graduation, Yonsei University — Feb. 2018

Talks and Presentations

2025 Combinatorics Workshop, IBS, Daejeon, South Korea — Aug. 2025
- ◇ Title: Learning-augmented online bipartite fractional matching
- ◇ Contributed talk

DGIST BRL AGSTA Seminar, DGIST, Daegu, South Korea — Aug. 2024
- ◇ Title: Online rounding for set cover under subset arrivals

Discrete Analysis Seminar, Yonsei University, Seoul, South Korea — Aug. 2024
- ◇ Title: Online rounding for set cover under subset arrivals

Combinatorial Optimization Seminar, Yonsei University, Seoul, South Korea — Aug. 2025
- ◇ Title: Learning-augmented online bipartite fractional matching

HALG 2025, ETH Zurich, Zurich, Switzerland — June 2025
- ◇ Title: Learning-augmented algorithms for the multi-option ski rental problem
- ◇ Contributed talk and poster presentation

COG Seminar, University of Wrocław, Wrocław, Poland — May 2025
- ◇ Title: Learning-augmented online bipartite fractional matching

COG Seminar, University of Wrocław, Wrocław, Poland — Dec. 2024
- ◇ Title: Online correlated selection

Discrete Analysis Seminar, Yonsei University, Seoul, South Korea — June 2024
- ◇ Title: Three-way online correlated selection

Discrete Math Seminar, IBS DIMAG, Daejeon, South Korea — May 2024
- ◇ Title: Three-way online correlated selection

ICML 2023, Honolulu, HI, USA — July 2023

◇ Title: Improved learning-augmented algorithms for the multi-option ski rental problem via best-possible competitive analysis

◇ Poster presentation

Theory Tea, Cornell University, Ithaca, NY, USA — Dec. 2022

◇ Title: Three-way online correlated selection

ISAAC 2021, Fukuoka, Japan (virtual) — Dec. 2021

◇ Title: Making three out of two: Three-way online correlated selection

AAAC 2021, Tainan, Taiwan (virtual) — Oct. 2021

◇ Title: Making three out of two: Three-way online correlated selection

ISAAC 2020, Hong Kong, China (virtual) — Dec. 2020

◇ Title: Constant-factor approximation algorithms for the parity-constrained facility location problem

Research Experience

Intern, Cornell University — Sept. 2022 – Dec. 2022

◇ Director: David B. Shmoys

Undergraduate intern, Yonsei University — Jan. 2017 – Feb. 2018

◇ Advisor: Hyung-Chan An

Teaching Experience

Teaching assistant, Yonsei University

◇ CSI2103/CCO2103 Data Structures — Spring 2018 – 2021, 2023, 2024

◇ CSI3108 Algorithm Analysis — Fall 2018 – 2021, 2023

◇ AIC2130 Computer Algorithms for AI Applications — Fall 2023

◇ GEK6205 Design and Analysis of Optimization Algorithms — Fall 2023

Undergraduate voluntary tutor, Yonsei University

◇ CSI3108 Algorithm Analysis — Fall 2016, 2017

◇ CSI2103 Data Structures — Spring 2017

Miscellaneous Experience

Co-organizer of Yonsei CS theory student group, Yonsei University — Jan. 2023 – Feb. 2024

◇ Initiated a reading group of TCS students in and out of Yonsei University

◇ Organizing seminar talks on various topics including mechanism design and quantum computing

Web programmer, Republic of Korea Air Force — Nov. 2013 – Aug. 2015

◇ In fulfillment of mandatory military service