# Sunghoon Hong

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Seoul, South Korea

## Experience

- **LG AI Research [🌐]** *Mar 2022 - Present*
  *Research Scientist* Seoul, South Korea
  - Conducting research on physical AI, especially robotics.
  - Developed reinforcement learning methods for optimizing petrochemical plant scheduling, recognized with the LG Award 2025.
  - Designed combinatorial optimization approaches for circuit design.

## Education

- **Korea Advanced Institute of Science and Technology (KAIST)** *Mar 2020 - Feb 2022*
  *Master of Science, Graduate School of AI* Seoul, South Korea
  - GPA: 3.72/4.00 (4.0/4.3)
  - Advisor: Prof. Kee-Eung Kim

- **Yonsei University** *Mar 2014 - Feb 2020*
  *Barchelor of Science, Department of Computer Science and Engineering* Seoul, South Korea
  - GPA: 3.53/4.00 (3.8/4.3)
  - 2 years for military service.

## Research Interest

Reinforcement Learning, Vision-Language-Action Models, Physical Intelligence

## Publications

**[W.4]** Deunsol Yoon*, **Sunghoon Hong***, Whiyoung Jung*, Kanghoon Lee, and Woohyung Lim. **Enhancing Naphtha Cracking Center Scheduling via Population-Based Multi-Scenario Planning**. In *IJCAI 2025 Workshop: Agent AI for Scenario Planning (AgentScen)*, 2025.

**[C.6]** Whiyoung Jung*, **Sunghoon Hong***, Deunsol Yoon*, Kanghoon Lee, and Woohyung Lim. **Agent-Centric Actor-Critic for Asynchronous Multi-Agent Reinforcement Learning**. In *ICML*, 2025.

**[C.5]** Jeonghye Kim, Yongjae Shin, Whiyoung Jung, **Sunghoon Hong**, Deunsol Yoon, Youngchul Sung, Kanghoon Lee, and Woohyung Lim. **Penalizing Infeasible Actions and Reward Scaling in Reinforcement Learning with Offline Data**. In *ICML*, 2025.

**[C.4]** Yongjae Shin, Jeonghye Kim, Whiyoung Jung, **Sunghoon Hong**, Deunsol Yoon, Youngsoo Jang, Geon-Hyeong Kim, Jongseong Chae, Youngchul Sung, Kanghoon Lee, and Woohyung Lim. **Online Pre-Training for Offline-to-Online Reinforcement Learning**. In *ICML*, 2025.

**[W.3]** **Sunghoon Hong***, Whiyoung Jung*, Deunsol Yoon*, Kanghoon Lee, and Woohyung Lim. **Agent-Oriented Centralized Critic for Asynchronous Multi-Agent Reinforcement Learning**. In *AAMAS 2024 Workshop: Adaptive Learning and Agents (ALA)*, 2024.

**[C.3]** **Sunghoon Hong**, Deunsol Yoon, Whiyoung Jung, Jinsang Lee, Hyundam Yoo, Jiwon Ham, Suhyun Jung, Chanwoo Moon, Yeontae Jung Jung, Kanghoon Lee, Woohyung Lim, Somin Jeon, Myounggu Lee, Sohui Hong, Jaesang Lee, Hangyoul Jang, Changhyun Kwak, Jeonghyeon Park, Changhoon Kang, and Jungki Kim. **Naphtha Cracking Center Scheduling Optimization using Multi-Agent Reinforcement Learning**. In *AAMAS Demonstration Track*, 2024.

**[W.2]** Hanbum Ko, Minu Kim, Han-Seul Jeong, **Sunghoon Hong**, Deunsol Yoon, Youngjoon Park, Woohyung Lim, Honglak Lee, Moontae Lee, Kanghoon Lee, Sungbin Lim, and Sungryull Sohn. **Hierarchical Decomposition Framework for Feasibility-hard Combinatorial Optimization**. In *ICML 2023 Workshop: Sampling and Optimization in Discrete Space*, 2023.

**[W.1]** Kanghoon Lee, Youngjoon Park, Han-Seul Jeong, **Sunghoon Hong**, Deunsol Yoon, Sungryull Sohn, Minu Kim, Hanbum Ko, Moontae Lee, Honglak Lee, Kyunghoon Kim, Euihyuk Kim, Seonggeon Cho, Jaesang Min, and Woohyung Lim. **ReSPack: A Large-Scale Rectilinear Steiner Tree Packing Data Generator and Benchmark**. In *NeurIPS 2022 Workshop: SyntheticData4ML*, 2022.

**[C.2]** **Sunghoon Hong**, Deunsol Yoon, and Kee-Eung Kim. **Structure-Aware Transformer Policy for Inhomogeneous Multi-Task Reinforcement Learning**. In *ICLR*, 2022.

**[C.1]** Deunsol Yoon*, **Sunghoon Hong***, Byung-Jun Lee, and Kee-Eung Kim. **Winning the L2RPN Challenge: Power Grid Management via Semi-Markov Afterstate Actor-Critic**. In *ICLR*, 2021.

## Patents

**[P.2]** **Sunghoon Hong**, Deunsol Yoon, Whiyoung Jung, Kanghoon Lee, and Woohyung Lim. **System, method and apparatus for multi-agent reinforcement learning**. US Patent App. 19/073,670, 2025.

**[P.1]** **Sunghoon Hong**, Deunsol Yoon, Whiyoung Jung, Kanghoon Lee, and Woohyung Lim. **Method and apparatus for optimizing scheduling using reinforcement learning**. US Patent App. 19/069,386, 2025.

## Honors and Awards

- **LG Awards 2025** *Apr 2025*
  *LG Corporation* [🌐]
  - Prestigious company-wide innovation award presented by LG Corporation.
  - Recognized for deploying an AI-based scheduling system at LG Chem's petrochemical plant, significantly enhancing operational efficiency and profitability.
- **1st Place, Learning to Run a Power Network (L2RPN) Challenge** *Jul 2020*
  *L2RPN WCCI 2020, RTE France* [🌐]
  - Achieved first place in an international AI competition focused on real-world power grid control and optimization.

## Additional Information

**Languages:** Korean (Native), English (Intermediate), Japanese (Intermediate), Chinese (Beginner)