Byeongmok Kim

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EDUCATION

PURDUE UNIVERSITY, West Lafayette, IN, US **08/2020-Present**
Ph.D. Candidate in Industrial Engineering
School of Industrial Engineering
Advisor: Dr. Seokcheon Lee

Dissertation: "Scheduling and control of autonomous mobile robots in material handling using machine learning"

POHANG UNIVERSITY OF SCIENCE AND TECHNOLOGY, Pohang, Korea **03/2013-02/2015**
Master of Science in Industrial and Management Engineering (Cumulative GPA 3.93/4.3)
Department of Industrial and Management Engineering
Advisor: Dr. Byung-In Kim

Thesis: "Waiting strategy for the dynamic pickup and delivery problem with time windows in the food delivery industry"

HONGIK UNIVERSITY, Seoul, Korea **03/2007-02/2013**
Bachelor of Science in Engineering (Cumulative GPA 4.29/4.5)
Department of Industrial Engineering, School of Information & Computer Engineering, College of Engineering

JOURNAL PAPERS

1. **Kim, B.**, Kim, Y., & Lee, S. (2024). Decentralized protocols for autonomous mobile robots in material handling: inductive learnings from centralized controller. *International Journal of Production Research* (In Press).

2. **Kim, B.**, Kim, J. G., & Lee, S. (2024). A multi-agent reinforcement learning model for inventory transshipments under supply chain disruption. *IISE Transactions*, 56 (7), 715-728.

3. **Kim, B.**, Jeong, H. Y., & Lee, S. (2023). Two-echelon collaborative routing problem with heterogeneous crowd-shippers. *Computers & Operations Research*, 160, 106389.

4. **Kim, B.**, Lee, S. (2024). Electric vehicle charging on the go via unmanned aerial vehicle: optimal charging policy. (Under Review).

CONFERENCE PROCEEDINGS

1. **Kim, B.**, Kim, Y., & Duffy, V. G. (2023, July). Bibliometric analysis and systematic literature review on data visualization. In *International Conference on Human-Computer Interaction* (pp. 490-502). Cham: Springer Nature Switzerland.

WORKING PAPERS

1. **Kim, B.**, Salama, M., & Lee, S. Optimizing routes of ground robots for efficient electric vehicle charging.

2. **Kim, B.**, Biller, S., & Lee, S. Composite dispatching rule learning from optimized solutions for autonomous mobile robots in congested areas.

PATENT

1. Method for Generating Driving Schedule and Apparatus Thereof, Korea Intellectual Property Office (NO: 10-1678300), November 14, 2016

HONORS & AWARDS

Bilsland Dissertation Fellowship, Purdue University 01/2025-05/2025
Scholarship, The Kwanjeong Educational Foundation 03/2013-02/2015
National Excellence Scholarship in Science and Engineering, Korea Student Aid Foundation 09/2012
Scholarship for Excellent Academic Records, Hongik University 03/2008, 09/2010, 03/2011, 09/2011, 03/2012

PROFESSIONAL EXPERIENCE

HYUNDAI STEEL, Dangjin, Korea **05/2018-05/2020**
Research Engineer, Technology & Quality Division

Research Project
1. Mold level control automation: enhancing precision and efficiency (09/2019-05/2020)
2. Optimization of special steel production schedule for maximizing productivity (06/2019-05/2020)
3. Developing a computerized system for mold steel production plant (06/2019-05/2020)
4. Developing raw material quality prediction system (05/2018-08/2019)
5. Addressing scheduling optimization needs for each process in the steel industry (02/2019-05/2019)
6. Real-time optimization of the cokes discharge schedule for maximizing hourly outbound quantity (01/2019-05/2019)

Teaching
1. Scheduling optimization (Smart factory academy sponsored by the CEO) (03/2019-08/2019)

Award
1. Smart factory promotion achievement award (09/2019)

LG ELECTRONICS, Pyeongtaek, Korea **12/2014-02/2018**
Research Engineer, Materials & Production Engineering Research Institute

Research Project
1. Developing production line design optimization systems for in-vehicle infotainment production factories (10/2017-02/2018)
2. Improving productivity in in-vehicle infotainment production factories (01/2016-09/2017)
3. Establishing the internal production system for the label printing process in an air conditioner production factory (03/2015-12/2015)

Teaching
1. Design principles 3S: simplification, standardization, and shareness (Company-wide training at LG Electronics) (02/2017)
2. Introduction of modular design (Company-wide training at LG Electronics) (02/2016)

Award
1. Excellent new employee award (03/2015)

RESEARCH EXPERIENCE

PURDUE UNIVERSITY, West Lafayette, IN, US

Research assistant sponsored by the Korea Ministry of Trade and Industry **04/2022-Present**

- Developing AI-based technology to optimize logistics operations in response to manufacturing process conditions
  - Designing a multi-shortest path planning algorithm
  - Developing a method for identifying potential collisions between mobile robots
  - Developing a collision avoidance scheduling algorithm
  - Developing a mixed-integer linear programming model and a genetic algorithm (GA)
  - Establishing an inductive learning framework
  - Designing supervised learning algorithms to extract knowledge from solutions generated by the GA
  - Designing a decentralized protocols based on from rules learned from supervised learning
  - Conducting simulations under various manufacturing conditions

POHANG UNIVERSITY OF SCIENCE AND TECHNOLOGY, Pohang, Korea

Research assistant sponsored by FoodFly **03/2014-02/2015**

- Real-time optimization of FoodFly's food delivery vehicle routing
  - Development of a real-time optimization algorithm for food delivery routing using predictive customer order data and vehicle idle time and positioning

Research assistant sponsored by CJ Global Logistics Service **03/2013-02/2014**

- Optimization of vehicle routing for parcel delivery of CJ Global Logistics Service
  - Development of routing optimization algorithms for heterogeneous parcel delivery vehicles considering customer clusters

TEACHING EXPERIENCE

PURDUE UNIVERSITY, West Lafayette, IN, US
Instructor

Course: Purdue Academy of Global Engineering program (PAGE) (Summer 2024)

- Content: Applications of operations research and machine learning
- Participants: 17 undergraduate students
- Duration: 19 days, 2 hours of classes daily

PURDUE UNIVERSITY, West Lafayette, IN, US
Teaching Assistant

Course: IE590 Project Management (Spring 2022)

- Supervisor: Dr. Seokcheon Lee

Course: IE545 Engineering Economic Analysis (Fall 2021)

- Supervisor: Dr. David Johnson

Course: IE566 Production Management Control (Summer 2021)

- Supervisor: Dr. Erhan Karakaya

Course: IE579 Design and Control of Production and Manufacturing Systems (Fall 2020)

- Supervisor: Dr. Shimon Y. Nof

POHANG UNIVERSITY OF SCIENCE AND TECHNOLOGY, Pohang, Korea
Teaching Assistant

Course: MEIE662 Discrete Optimization (Spring 2014)
- Supervisor: Dr. Byung-In Kim

Course: IMEN281 Information System Technology (Fall 2013)
- Supervisor: Dr. Byung-In Kim

CONFERENCE PRESENTATIONS

1. Developing AI-based technology to optimize logistics operations in response to manufacturing process conditions. *Korea-US Advanced Industry Joint R&D Conference*, National Bioskills Laboratories, San Francisco, USA. November 2023
2. Learning-based operations of an autonomous mobile robot system for material handling. *INFORMS Annual Meeting*, Phoenix, USA. October 2023
3. A multi-agent reinforcement learning model for inventory transshipments under supply chain disruption. *The 1st Purdue Operations Conference*, Purdue University, West Lafayette, USA. September 2023
4. Bibliometric analysis and systematic literature review on data visualization. *HCI International 2023*, Copenhagen, Denmark. July 2023
5. A multi-agent reinforcement learning for horizontal inventory transshipments under non-stationary customer demand and supply capacity loss. *INFORMS Annual Meeting*, Indianapolis, USA. October 2022
6. Dynamic pickup and delivery problem in food delivery. *Conference of Korea Institute of Industrial Engineers*, Kyonggi University, Suwon, Korea. November 2014
7. A rich vehicle routing problem with consideration of various real-world issues. *The Joint Conference of The Korean Operations Research and Management Science Society and The Korean Institute of Industrial Engineers*, Busan, Korea. May 2014.

MENTORING EXPERIENCE

PURDUE UNIVERSITY, West Lafayette, IN, US

Jungeun Hwang (Lab intern, Undergraduate student) **05/2023-08/2023**
- Research on feature selection methods

Aaron Jameson Dewar (Lab intern, Undergraduate student) **05/2022-08/2022**
- Research on inductive learning

Mahen Mane (Student of IE490 independent study, Undergraduate student) **12/2021-05/2021**
- Research on underground logistics systems

Ali Merza Hasan (Student of IE490 independent study, Undergraduate student) **12/2021-05/2021**
- Research on underground logistics systems

SERVICE

Reviewing for Journals:
Transportation Research Part A: Policy and Practice (2024)
Journal of Advanced Transportation (2024)
International Journal of Production Economics (2022)

COMPUTER SKILLS

- **Programming languages:** C#, C++, Python, VBA, MATLAB
- **Data analysis tools:** Minitab, SAS
- **Optimization package:** CPLEX
- **Simulation tools:** Arena
- **Project management tools:** Microsoft Project