Hyunwoo Shin

hyunwoos@vt.edu | https://hyunwoo-shin.github.io/

Education

Virginia Polythechnic Institute and State University — Blacksburg, VA
Ph.D. in Industrial and System Engineering — *Aug 2021 – Current*

Korea Aerospace University — Goyang city, South Korea
M.S. in Logistics, School of Air Transport, Transportation, and Logistics — *Mar 2018 – Feb 2020*

Korea Aerospace University — Goyang city, South Korea
B.S. in Logistics, School of Air Transport, Transportation, and Logistics — *Mar 2012 – Feb 2018*

Publication

[1] **Hyunwoo Shin**, S. Tunc, X. Chen, V. Puri. A Detailed Simulation Framework for Evaluating U.S. Lung Allocation Policies: Model Development and Validation. Working Paper
[2] **Hyunwoo Shin**, S. Tunc, P. Afeche, M. Begen, B. Sandikci, F. Murillo, B. Hansen, M. Claasen, G. Sapisochin. An In-depth Analysis of the Organ Offer Decisions in the Canadian Liver Transplant System. Working Paper
[3] **Hyunwoo Shin**, S. Tunc, X. Chen, D. Kreisel, V. Puri. Enhancing Organ Transplant Allocation: A Machine Learning Approach to Predicting and Interpreting LAS Dynamics. Working Paper
[4] **Hyunwoo Shin**, and Junjae Chae (2020). A Performance Review of Collision-Free Path Planning Algorithms. Electronics, 9(2), 316. DOI: 10.3390/electronics9020316
[5] Hyeok-Yeon Lee, **Hyunwoo Shin**, and Junjae Chae (2018). Path planning for mobile agents using a genetic algorithm with a direction guided factor. Electronics, 7(10), 212. DOI: 10.3390/electronics7100212
[6] Minhee Kim, **Hyunwoo Shin**, and Junjae Chae (2017). Merge Control using Reserve Ahead Point in Baggage Handling System. Journal of the Society of Korea Industrial and Systems Engineering, 40(2), 60-67.

Professional Experience

Graduate Research Assistant (Academic Advisor: Dr. Sait Tunc) — Aug 2024 – Dec 2024
Virginia tech — *Blacksburg, VA*
- Optimizing the lung allocation policy via simulation model
- Verification and validation for the liver simulation model

Graduate Research Assistant (Academic Advisor: Dr. Sait Tunc) — Dec 2021 – Aug 2022
Virginia tech — *Blacksburg, VA*
- Processing data for lung transplantation and developing a simulation model for lung transplant system
- Study a model for estimating lung allocation score with uncertainty

Researcher — Dec 2020 – Jul 2021
Logistics System Lab, Korea Aerospace University — *Goyang city, South Korea*
- **CyberLogitec & Korea Maritime Institute**: Developing a control logic for multi-shuttle operation in an automated container yard and simulation oracle to validate the logic
- **Nexen Tire & SL solution**: Developing an algorithm to solve job assignment problem for new business model

Research Assistant (Academic Advisor: Dr. Junjae Chae) — Mar 2018 – Feb 2020
Logistics System Lab, Korea Aerospace University — *Goyang city, South Korea*
- **Hanjin Logistics Institute**: Analyzed a new logic for automation of gantry cranes used in a port by simulation
- **Korea Aerospace University**: Surveyed the methodologies for UAV path planning and analyzing the efficient and characteristics of the popular algorithms which are heuristic or metaheuristic

Research Intern (Academic Advisor: Dr. Junjae Chae) — Mar 2016 – Feb 2018
Logistics System Lab, Korea Aerospace University — *Goyang city, South Korea*
- **SK Telecom & SL Solution**: Developed an algorithm for finding a reasonable solution of Vehicle routing problem considering real distance based on a map, characteristics of products and operation rule within reasonable time
- **Ministry of Land, Infrastructure and Transport**: Developed an unmanned logistic system with UAV, a path finding program based on Genetic algorithm (GA) considering obstacles was studied
- Analyzed a merging control logic for Baggage Handling system using AutoMod

Teaching Experience

STAT 4705: Statistics for Engineers Spring 2025
Graduate Teaching Assistant *Virginia Tech*

ISE 2404: Deterministic Operations Research Summer 2024
Graduate Teaching Assistant *Virginia Tech*

ISE 5414: Random Process Spring 2024
Graduate Teaching Assistant *Virginia Tech*

ISE 5244: Facilities Planning and Material Handling Spring 2024
Graduate Teaching Assistant *Virginia Tech*

ISE 4424: Logistics Enginnering Fall 2023
Graduate Teaching Assistant *Virginia Tech*

ISE 2034: Data Management for Industrial and Systems Engineers Spring 2023
Graduate Teaching Assistant *Virginia Tech*

ISE 5204: Manufacturing Systems Engineering Fall 2022
Graduate Teaching Assistant *Virginia Tech*

ISE 4404: Statistical Quality Control Fall 2022
Graduate Teaching Assistant *Virginia Tech*

Operations Research 1 Spring 2021
Lecturer *Korea Aerospace University*

- Introduction to linear programming for sophomore

Analysis of Logistics System Fall 2018 & Fall 2019
Teaching Assistant *Korea Aerospace University*

Presentations

INFORMS | *Annual Meeting 2024* Seattle, WA

- **Hyunwoo Shin**, Xi Chen and Sait Tunc. Calibration of Simulation Models for Organ Allocation Using Conformal Prediction Concepts

INFORMS | *Annual Meeting 2023* Phoenix, AZ

- **Hyunwoo Shin**, Xi Chen and Sait Tunc. Forecasting Organ Transplant Allocation Scores Using Machine Learning Models

Decision Science Institute (DSI) | *49th Annual Meeting 2018* Chicago, IL

- **Hyunwoo Shin**, Junjae Chae, and Jae-Ho Bae. The Algorithms Solving Collision-free Shortest Path Planning for Mobile Agents: A Performance Review

Korea Logistics Society | *2018 Fall Conference* Goyang city, Gyeonggi

- **Hyunwoo Shin**, and Junjae Chae. A Performance Review of Collision-Free Path Planning Algorithms for AGV

The Society of Korea Industrial and Systems Engineering | *2017 Spring Conference* Daejeon

- Gyeongho Gim, **Hyunwoo Shin**, Hansol Lim and Yeongmin Yun. Multi-modal VRP algorithm with trucks and drones: A case study of Seoul (advised by Dr. Junjae Chae)

The Society of Korea Industrial and Systems Engineering | *2016 Autumn Conference* Seoul

- **Hyunwoo Shin**, Minhee Kim and Sanghun Lee. Conveyor Merge Control Logic in Baggage Handling System (advised by Dr. Junjae Chae)

Honors & Awards

Scholarship for excellent academic records | *Korea Aerospace University*

- Undergraduate: 1st Semester of 2013, 1st Semester of 2016, 2nd Semester of 2016, 1st Semester of 2017, and 2nd Semester of 2017
- Graduate: 1st Semester of 2018, 2nd Semester of 2018, and 1st Semester of 2019

Best Paper Award | *Korea Logistics Society, 2018 Fall Conference*

Technical Skills

Languages: Python, C++, R, Java
Software Packages: AutoMod, ARENA, ExtendSim, CPLEX, RapidMiner, Minitab
Methodologies: Simulation Optimization, Surrogate Modeling, Machine Learning, Nonparametric Bayesian Methods, Parallel Computing
Operating Systems: Linux (Ubuntu), Windows (WSL)