YOUNG IN KIM

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EDUCATION

Georgia Institute of Technology, Atlanta, GA *Aug. 2020 - Present*
Ph.D. candidate in Industrial Engineering (Minor: Machine Learning)
Thesis (Proposed, April 2023): "Min-Time Coverage In Constricted Environments"
Advisor: Dr. Spyros Reveliotis

Sungkyunkwan University, Suwon, South Korea *Aug. 2017 - Feb. 2019*
M.S., Industrial Engineering
Thesis: "Rescheduling of unrelated parallel machines with sequence-dependent setup times under the prediction of machine disruptions"
Advisor: Dr. Hyun-Jung Kim

Sungkyunkwan University, Suwon, South Korea *Mar. 2012 - Aug. 2017*
B.S., Systems Management Engineering

RESEARCH INTEREST

Planning, Scheduling/Rescheduling, Control, and Optimization of Industrial Systems.
Applications: Smart Manufacturing Systems; Robotics

PUBLICATIONS

Journal Papers:

[J1] **Young-In Kim** and Spyros Reveliotis. (2024) A Streamlined Heuristic for the Problem of Min-Time Coverage in Constricted Environments. *IEEE Transactions on Automation Science and Engineering* (Early Access).

[J2] **Young-In Kim** and Spyros Reveliotis. (2024) A Heuristic Approach to the Problem of Min-Time Coverage in Constricted Environments. *IEEE Transactions on Control of Network Systems* 11(2): 635–647.

[J3] **Young-In Kim** and Spyros Reveliotis. (2024) A Strong Combinatorial Relaxation for the Problem of Min-Time Coverage in Constricted Environments. *IEEE Transactions on Automatic Control* 69(5): 2963–2978.

[J4] Spyros Reveliotis and **Young-In Kim**. (2022) Min-Time Coverage in Constricted Environments: Problem Formulations and Complexity Analysis. *IEEE Transactions on Control of Network Systems* 9(1): 172–183.

[J5] **Young-In Kim** and Hyun-Jung Kim. (2021) Rescheduling of unrelated parallel machines with job-dependent setup times under forecasted machine breakdown. *International Journal of Production Research* 59(17): 5236–5258.

Conference Proceedings:

[C6] **Young-In Kim** and Spyros Reveliotis. (2023) Min-Time Coverage in Constricted Environments with Arbitrary Guidepath Networks. *The 62nd IEEE Conference on Decision and Control (IEEE CDC 2023).*

[C7] **Young-In Kim** and Spyros Reveliotis. (2022) Some structural results for the problem of Min-Time Coverage in Constricted Environments. *16th Intl. Workshop on Discrete Event Systems.*

Work In Progress:

[W8] **Young-In Kim** and Spyros Reveliotis. A Heuristic Approach to the Problem of Min-Time Coverage in Constricted Environments with Arbitrary Guidepath Networks (*submitted*).

[W9] Min-Time Coverage in Constricted Environments with arbitrary guidepath networks and heterogeneous robotic fleets.

[W10] A Heuristic Approach to the Problem of Min-Time Coverage in Constricted Environments with arbitrary guidepath networks and heterogeneous robotic fleets.

ORAL AND POSTER PRESENTATIONS

- A Heuristic Approach to the Problem of Min-Time Coverage in Constricted Environments with Arbitrary Guidepath Networks.
  - Presentation at INFORMS Annual Meeting. Seattle. USA. Oct. 2024.
- Min-Time Coverage in Constricted Environments with Arbitrary Guidepath Networks.
  - Presentation at the 62nd IEEE Conference on Decision and Control (IEEE CDC 2023). Singapore. Dec. 2023.
- A Streamlined Heuristic For The Problem Of Min-Time Coverage In Constricted Environments.
  - Poster at INFORMS Annual Meeting. Phoenix. USA. Oct. 2023.
  - Poster at 28th IEEE International Conference on Emerging Technologies and Factory Automation (ETFA 2023). Sinaia. Romania. Sept. 2023.
- Some structural results for the problem of Min-Time Coverage in Constricted Environments.
  - Presentation at 16th Intl. Workshop on Discrete Event Systems (WODES 2022). Prague. Czech Republic. Sept. 2022.
- Min-Time Coverage in Constricted Environments.
  - Poster at INFORMS Annual Meeting. Indianapolis. USA. Oct. 2022.
- Rescheduling of unrelated parallel machines with sequence-dependent setup times under the prediction of machine disruptions.
  - Presentation at Fall Annual Conference of Korea Institute of Industrial Engineers (KIIE). Seoul. Korea. Nov. 2018.
- An intelligent production control system for automotive parts manufacturing.
  - Presentation at Spring Annual Conference of Korean Institute of Industrial Engineers (KIIE). Kyeongju. Korea. Apr. 2018.

CERTIFICATES, AWARDS, SCHOLARSHIPS AND FELLOWSHIPS

Teaching Certificates

- Center for Teaching & Learning (CTL) Tech to Teaching Certificate
- Center for the Integration of Research, Teaching & Learning (CIRTL) Associate Teaching Certificate

Stewart Fellowship, Georgia Institute of Technology, Fall 2020 & Spring 2021

Graduate Merit Scholarship, Sungkyunkwan University, Fall 2017, Spring 2018, & Fall 2018

Concurrent BS/MS Program Scholarship (100%), Sungkyunkwan University, Spring 2017

Dean's List Award, College of Engineering, Sungkyunkwan University, Fall 2016 & Spring 2017

National Scholarship for Science and Engineering, Korea Student Aid Foundation, Fall 2016

TEACHING EXPERIENCE

- Graduate Student Instructor
  - Workflow Design in Manufacturing and Service Systems (ISYE 4112) in Summer 2024, the Department of Industrial and Systems Engineering, Georgia Institute of Technology
- Graduate Teaching Assistant
  - Supply Chain Engineering I: Warehousing Science (ISYE 6335) in Fall 2024, the Department of Industrial and Systems Engineering, Georgia Institute of Technology
  - Manufacturing Systems (ISYE 6201) in Spring 2024 and Spring 2023, the Department of Industrial and Systems Engineering, Georgia Institute of Technology
  - Statistical Methods for Manufacturing Design/Improvement (ISYE 6405) in Fall 2023 and Fall 2022, the Department of Industrial and Systems Engineering, Georgia Institute of Technology
  - Basic Statistical Methods (ISYE 3030) in Summer 2023, the Department of Industrial and Systems Engineering, Georgia Institute of Technology
  - Supply Chain Modeling: Manufacturing & Warehousing (ISYE 3104) in Summer 2022, the Department of Industrial and Systems Engineering, Georgia Institute of Technology
  - Regression and Forecasting (ISYE 4031) in Spring 2021 and Fall 2020, the Department of Industrial and Systems Engineering, Georgia Institute of Technology
  - Operations Management (ESM3019) in Fall 2018, Spring 2018, and Fall 2017, the Department of Systems Management Engineering, Sungkyunkwan University

SELECTED RESEARCH EXPERIENCE

Optimized Coordination and Scheduling of Traffic Evolving on Complex Guide-path Networks (Sponsored by NSF ECCS)

Graduate Research Assistant *Aug. 2020 - Present*

- Defined new task allocation and traffic scheduling problems for networked mobile robots in physically constricted environments with limited wireless communication.
- Developed strong combinatorial relaxations that reduce the number of integer variables involved while preserving the optimality of solutions.
- Developed efficient heuristic algorithms for addressing practical-scale instances.

Development of advanced operations management system for smart factory with clean energy (Sponsored by Ministry of Trade, Industry and Energy/ SHINSUNG E&G)

Graduate Research Assistant *Aug. 2017 - Jul. 2018*

- Enhanced an advanced planning and scheduling system (APS) with respect to the operational productivity and stability of the assembly lines under disruptive events.
- Developed a rescheduling method of the assembly lines, under forecasted machine breakdowns.

Development of intelligent production management system for smart factory manufacturing parts (Sponsored by Ministry of Trade, Industry and Energy / Korea Smart Factory Foundation)

Graduate Research Assistant *Mar. 2017 - Apr. 2018*

- Designed a cyber physical system (CPS)-based factory operations monitoring system with the purpose of detecting unexpected events in an automotive parts manufacturing factory.
- Developed a dynamic scheduling method that enables the generation of reactive schedules under frequent disruptions in the production system.

WORK EXPERIENCE

Korea Institute of Industrial Technology Mar. 2020 - Jul. 2020
Science and Engineering Internship

· On-site internship in IT Convergence Process R&D Group.
· Worked on the application and development of the Asset Administration Shell (AAS), that is the digital representation of an asset, used to manage information and capabilities of the components in the factory.

Cheonan City Hall Jan. 2014 - Jan. 2016
Social Service Agent

· Served mandatory military service as a social service agent in the department of Welfare Policy in Cheonan City Hall.

TECHNICAL STRENGTHS

Modeling and Analysis	CPLEX, GUROBI
Computer	Python, C language, R programming, Matlab