Kyohong Shin

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Research Interests

Decision making in uncertainty
Markov Decision Processes
Reinforcement Learning (Approximate Dynamic Programming)
Emergency Medical Service system
Disaster response system

Education

B.S., Korea Advanced Institute of Science and Technology, 2012 Daejeon, Korea
Bachelor of Science and Engineering in Industrial & Systems Engineering

M.S., Korea Advanced Institute of Science and Technology, 2014 Daejeon, Korea
Master of Science and Engineering in Industrial & Systems Engineering. Thesis Title: *Priority Assignment Algorithm Considering Medical Capability of Hospital Emergency Units in Mass Casualty Incident*. Thesis Supervisor: T. Lee (Industrial & Systems Engineering, KAIST)

Ph.D., Korea Advanced Institute of Science and Technology, 2019 Daejeon, Korea
Doctor of Philosophy in Industrial & Systems Engineering. Thesis Title: Sequential decision making problems for operation management of emergency medical services system in mass-casualty incidents. Thesis Supervisor: T. Lee (Industrial & Systems Engineering, KAIST)

Award

Best Paper Award at 2014 Korea Society for Simulation (KSS) Annual Conference, May, 2014. (Lee, H. J., Shin, K. and Lee, T., "Activity cancelling in P-ACD and its application to EMS system modeling")

Professional Experience

Postdoctoral Research Associate September, 2019 - present
Department of Industrial & Systems Engineering, KAIST, Daejeon, Korea

Research Assistant March, 2014 - February, 2015
Department of Industrial & Systems Engineering, KAIST, Daejeon, Korea

Journal Publication

1. "Evaluation of Disaster Response System using Agent-based Model with Geospatial and Medical Details," Bae, J. W., Shin, K., Lee, H-R., Lee, H. J., Lee, T., Kim, J-H., Cha, W-C., Kim, G. W., and Moon, I-C., *IEEE Transactions System, Man, and Cybernetics: Systems*, 2017

2. "Priority Assignment for Emergency Medical Service Provision in Disaster by Considering Resource Limitation," Shin, K. and Lee, T., *Journal of the Korean Society of Hazard Mitigation*, 14(2):159-168, 2014.

Journal Papers Under Review

1. "Emergency Medical Service Resource Allocation in a Mass Casualty Incident by Integrating Patient Prioritization and Hospital Selection Problems," Shin, K. and Lee, T., *IISE Transactions*, under 3rd round review.

2. "A Novel Meta-Algorithm Approach to Enhance Scalability of Reinforcement Learning," Shin, K. and Lee, T., *Computers & Operations Research*, under review.

Conference Proceedings

1. "A Meta Algorithm for Reinforcement Learning: Emergency Medical Service Resource Prioritization Problem in an MCI as an Example," Shin, K. and Lee, T., *Fourth International Conference on Health Care Systems Engineering*, Montreal, Canada, May 30-June 1, 2019

2. "SPartAN: A Meta-algorithm for Reinforcement Learning using State Partitioning and Action Network," Shin, K. and Lee, T., *Winter Simulation Conference*, Gothenburg, Sweden, December 9-12, 2018.

3. "Characterizing Emergency Responses in Localities with Different Social Infrastructure using EMSSim," Lee, T., Shin, K., Lee, H-R., Lee, H.J., Sung, I., Bae, J.W., Lee, J., and Moon, I-C., *Winter Simulation Conference*, Washington D.C., USA, December 11-14, 2016.

4. "A Structured Approach for Constructing High Fidelity ED Simulation," Lee, W., Shin, K., Lee, H-R., Lee, Shin, H., and Lee, T., *Winter Simulation Conference*, Washington D.C., USA, December 11-14, 2016.

5. "Emergency Medical Service (EMS) System Design Evaluator," Shin, L., Sung, I., and Lee, T., *Winter Simulation Conference*, Washington D.C., USA, December 8-11, 2013.

Conference Presentations

1. "Decision Making under Compliance Uncertainty," Lee, T., Shin, K., and Song, Y., *2019 INFORMS annual meeting*, Oct 20-23, 2019, Seattle, USA.

2. "MDP Model Considering Mental Inertia of a Decision Performer to the Optimization," Song, Y., Shin, K., and Lee, T., *2019 KIIE Annual Spring Conference*, April 10-13, 2019, Gwangju, Korea.

3. "Patient Prioritization and Hospital Selection for EMS Response to Mass Casualty Incident," Shin, K. and Lee, T., *2018 INFORMS International Conference*, June 17-20, 2018, Taipei, Taiwan.

4. "Monte carlo tree search algorithm using action learning in small problems," Shin, K. and Lee, T., *2017 KIIE Annual Spring Conference*, April 26-28, 2017, Yeosu, Korea.

5. "Approximate Dynamic Programming using Monte Carlo Tree Search and Deep Neural Network," Shin, K. and Lee, T., *2016 KIIE Annual Fall Conference*, November 19, 2016, Seoul, Korea.

6. "Case study: Emergency Department Simulation of SMC," Lee, W., Shin, K., Lee, H-R., Lee, Shin, H., Lee, T., and Kang, W, *2016 KIIE Annual Spring Conference*, April 13-16, 2016, Jeju, Korea.

7. “Approximate Dynamic Programming for priority assignment and hospital selection in mass-casualty incident,” Shin, K. and Lee, T., *2015 KIIE Annual Spring Conference*, April 8-11, 2015, Jeju, Korea.

8. “Markov Decision Process model for prioritizing and distributing patients to multiple-hospitals under mass casualty incident,” Shin, K. and Lee, T., *2014 KIIE Annual Spring Conference*, May 16-17, 2014, Busan, Korea.

9. “Activity cancelling in P-ACD and its application to EMS system modeling,” Lee, H. J., Shin, K. and Lee, T., *2014 Korea Society for Simulation (KSS) Annual Conference*, May 30, 2014, Daegu, Korea.

10. “A simulation model for assessments of an emergency medical service system,” Sung, I., Shin, K. and Lee, T., *2013 KIIE Annual Spring Conference*, May 24-25, 2013, Yeosu, Korea.

Research Projects

1. Automated Logistics System Optimization of a Tire Factory, participating researcher, Hankook Tire & Technology, January, 2019 – present

2. A Study on the Efficiency Improvement of Fraud Detection System, participating researcher, Hyundai Card, January, 2018 – November, 2018

3. Decision Making Model under Future Disaster Response System, participating researcher, National Research Foundation of Korea (NRF), June, 2016 – May, 2019

4. Research and Development of Modeling and Simulating the Rescues, the Transfer, and the Treatment of Disaster Victims, participating researcher, Ministry of Public Safety and Security, May, 2013 – April, 2015

5. Interdependent Disaster Modeling for Critical Infrastructures, participating researcher, National Research Foundation of Korea (NRF), February, 2012 – July, 2014