Hyun-Rok Lee

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Research Interests

Multi-agent reinforcement learning, Imitation learning, Complex system design, Decision making under uncertainty

Education

Ph.D. Candidate, Industrial & Systems Engineering KAIST

- Expected graduation date: Feb, 2020
- Thesis Title: "Algorithm and application of imitation learning and reinforcement learning for sequential decision making problem with multiple agents"
- Advisor: Professor Taesik Lee (Department of Industrial & Systems Engineering, KAIST)

M.S., Industrial & Systems Engineering, Feb, 2015 KAIST

- Thesis Title: "Algorithm for patient admission decision at an emergency department in the event of disaster"
- Advisor: Professor Taesik Lee (Department of Industrial & Systems Engineering, KAIST)

B.S., Industrial & Systems Engineering, Feb, 2013 KAIST

- Double Major: Management Science

Honors & Award

Student Travel Support Scholarship. International Foundation for Autonomous Agents and Multiagent Systems (IFAAMAS). May, 2019. (**Lee, H.-R.**, & Lee, T. (2019). Improved cooperative multi-agent reinforcement learning algorithm augmented by mixing demonstrations from centralized policy. *Proceedings of the 18th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2019)*, Montreal, Canada.)

Best Paper Award. The Korean Federation of Science and Technology Society. July, 2015. (Hwang, K., Lee, T. and **Lee, H.-R.**. 2014. Simulation model for pandemic disease spreading by using census data. Journal of the Korean Institute of Industrial Engineers 40(2):163-171.)

Journal Publications

Lee, H.-R., & Lee, T. (2018). Markov decision process model for patient admission decision at an emergency department under a surge demand. *Flexible Services and Manufacturing Journal 30*(1-2), 98-122.

Bae, J. W., Shin, K., **Lee, H.-R.**, Lee, H. J., Lee, T. , Kim, J.-H., Cha, W.-C., Kim, G. W., & Moon, I.-C. (2018). Evaluation of disaster response system using agent-based model with geospatial and medical details. *IEEE Transactions on Systems, Man and Cybernetics: Systems 48*(9), 1454-1469.

Hwang, K. , Lee, T., & **Lee, H.-R.** (2014). Simulation model for pandemic disease spreading by using census data. *Journal of the Korean Institute of Industrial Engineers 40*(2), 163-171.

Ann, H. B., & **Lee, H.-R.** (2013). Spiral arm morphology of nearby galaxies. *Journal of the Korean Astronomical Society 46*, 141-149.

Journal Papers Under Review

Lee, H.-R., & Lee, T. Multi-agent reinforcement learning algorithm to solve a partially-observable multi-agent problem in disaster response. *European Journal of Operations Research*, under review, August, 2019.

Working Paper

Shin, H., **Lee, H.-R.**, & Lee, T. Hub location problem with interaction between hub-to-hub arcs.

Conference Proceedings

Lee, H.-R., & Lee, T. (2019). Improved cooperative multi-agent reinforcement learning algorithm augmented by mixing demonstrations from centralized policy. *Proceedings of the 18th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2019)*, Montreal, Canada.

Lee, W., Shin, K., **Lee, H.-R.**, Shin, H., & Lee, T. (2016). A structured approach for constructing high fidelity ED simulation. *Proceedings of the 2016 Winter Simulation Conference*, Washington D.C., USA.

Lee, T., Shin, K., **Lee, H.-R.**, Lee, H. J., Sung, I., Lee, J., & Moon, I.-C. (2016). Characterizing emergency responses in localities with different social infrastructure using EMSSim. *Proceedings of the 2016 Winter Simulation Conference*, Washington D.C., USA.

Moon, I.-C., Bae, J. W., Lee, J., Kim, D., **Lee, H.-R.**, Lee, T., Cha, W.-C., Kim, J.-H., & Kim, G. W. (2015). EMSSIM: Emergency medical service simulator with geographic and medical details. *Proceedings of the 2015 Winter Simulation Conference*, Huntington Beach, CA, USA.

Lee, H.-R., & Lee, T. (2015). Markov decision process model for patient admission decision at an emergency department in disasters. *Proceedings of the International Conference on Health Care Systems Engineering*, Lyon, France.

Lee, T., **Lee, H.-R.**, & Hwang, K. (2013). Identifying superspreaders for epidemics using R0-adjusted network centrality. *Proceedings of the 2013 Winter Simulation Conference*, Washington D.C., USA.

Magazine Article

Lee, H.-R., & Lee, T. (2014). Effectiveness of dispersed commute hours on infectious disease spread. *SCS M&S Magazine 4*(3).

Conference Presentation

Shin, H., **Lee, H.-R.**, Kim, T., & Lee, T. (2018). Location problem for designated landing and take-off facilities considering airspace congestion. *2018 KIIE Annual Fall Conference*, Seoul, Korea.

Lee, T., & **Lee, H.-R.** (2018). Patient admission decision at emergency department under mass casualty incident, *2018 INFORMS Annual Meeting*, Phoenix, Arizona, USA.

Lee, H.-R., & Lee, T. (2018). Supervised learning to solve decentralized patient admission problem in mass casualty incident. *2018 INFORMS International*, Taipei, Taiwan.

Lee, H.-R., Kim, T., Shin, H., & Lee, T. (2018). Optimization problem to find location of designated landing and taking-off areas in low altitude UAS Traffic Management system. *2018 KIIE Annual Spring Conference*, Gyeongju, Korea.

Lee, H.-R., & Lee, T. (2017). Modelling patient admission problem in mass casualty incident considering multiple cooperative hospitals. *2017 KIIE Annual Fall Conference*, Daejeon, Korea.

Lee, W., Shin, K., **Lee, H.-R.**, Lee, T., & Kang, W. (2016). Case study: emergency department simulation for SMC. *2016 KIIE Annual Spring Conference*, Jeju, Korea.

Lee, H.-R., & Lee, T. (2014). Optimal resource allocation policy for emergency room under mass casualty incident. *Korean Society for Industrial and Applied Mathematics(KSIAM) Annual Meeting*, Jeju, Korea.

Lee, H.-R., & Lee, T. (2014). Optimal resource allocation policy for emergency room under mass casualty incident. *2014 KIIE Annual Spring Conference*, Busan, Korea.

Lee, H.-R., Hwang, K. & Lee, T. (2013). Identifying superspreaders for epidemics using R0-adjusted network centrality. *2013 KIIE Annual Spring Conference*, Yeosu, Korea.

Hwang, K., **Lee, H.-R.**, & Lee, T. (2013). Simulation model for pandemic disease spreading by using census data. *2013 KIIE Annual Spring Conference*, Yeosu, Korea.

Research Project

Decision Models in Behavioral Operations Research, participating researcher, National Research Foundation of Korea (NRF), Sep 2019 – present

UAS Traffic Management System Design and Construction in Low Altitude, participating researcher, Ministry of Land, Infrastructure and Transport of Korean government, Apr 2017 - July 2019

Decision making model under future disaster response system, participating researcher, National Research Foundation of Korea (NRF), Jun 2016 – May 2019

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 - Apr 2015

Interdependent Disaster Modeling for Critical Infrastructures, participating researcher, Korea National Research Foundation of Korea (NRF), Mar 2013 - Jul 2014

Modeling & Simulation for Enhancement of Korea's Pandemic Response Capability, participating researcher, Korea National Research Foundation of Korea (NRF), Mar 2013 - Aug 2015

Teaching Assistants

IE425 Project Management, Department of Industrial & Systems Engineering, KAIST, Sep 2017 – Dec 2017

IE801 Special Topics in Industrial Engineering II <Startup Investment Management>, Department of Industrial & Systems Engineering, KAIST, Sep 2017 – Dec 2017

IE425 Project Management, Department of Industrial & Systems Engineering, KAIST, Sep 2016 – Dec 2016

ED100 Introduction to Design and Communication, KAIST, Sep 2014 – Dec 2014