

Dr. Soyi Jung

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Research Professor, Korea University – School of Electrical Engineering, Seoul, Republic of Korea

Postdoctoral Scholar, University of California at Irvine – Donald Bren School of Information and Computer Sciences, Irvine, CA, USA

Co-director, Korea University – Artificial Intelligence and Mobility (AIM) Laboratory, Seoul, Republic of Korea

- Email: jungsoyi@korea.ac.kr • Homepage: <https://soyijung.github.io>
- LinkedIn: <https://www.linkedin.com/in/soyijung>

Research Interests

- **Big-Data Processing Platforms:** Computation Outsourcing for Distributed Big-Data Processing
- **Trust Computing:** Optimal Auction through Deep Learning
- **Distributed Systems Design and Analysis:** Lyapunov Optimization, Queuing Theory

Educational Backgrounds

- **Ajou University**, Suwon, Republic of Korea
 - Ph.D. (03/2016–02/2021), Department of Electrical and Computer Engineering (Advisor: Prof. Jae-Hyun Kim)
 - M.S. (03/2013–02/2015), Department of Electrical and Computer Engineering (Advisor: Prof. Jae-Hyun Kim)
 - B.S. (03/2009–02/2013), Department of Electrical and Computer Engineering

R&D Positions

- **University of California at Irvine – Donald Bren School of Information and Computer Sciences**, Irvine, CA, USA
 - **Korea University – School of Electrical Engineering**, Seoul, Republic of Korea (Joint Appointment)
 - *Postdoctoral Scholar at UC-Irvine (05/2021–Present)*, Advisor: Prof. Marco Levorato
 - *Research Professor at Korea University Artificial Intelligence and Mobility Lab (03/2021–Present)*, Advisor: Prof. Joongheon Kim
- **Korea Testing and Research (KTR) Institute**, Gwacheon, Republic of Korea
 - *Researcher (03/2015–02/2016)*

Awards and Honors

- **Best Paper Award**, *IEEE ICOIN (IEEE International Conference on Information Networking)* 01/2021
 - Infrastructure-Assisted Cooperative Multi-UAV Deep Reinforcement Energy Trading Learning for Big-Data Processing.
- **ICT Paper Contest Award by Electronics Times, KIIE (Korean Institute of Information Scientists and Engineers)** 12/2019
 - Reducing Consecutive Collisions in Sensing Based Semi Persistent Scheduling for Cellular-V2X.
- **Bronze Paper Award**, *IEEE Seoul Section Student Paper Contest* 12/2019
 - Enhanced Resource Selection Algorithm of 3GPP C-V2X Communication.
- **Outstanding Paper Award**, *KICS (Korean Institute of Communications and Information Sciences)* 11/2017
 - Wireless Caching Algorithm Based on User's Context in Smallcell Environments.
- **Young Woman Researcher Award**, *WISSET (Korea Center for Women in Science, Engineering, and Technology) and KICS (Korean Institute of Communications and Information Sciences)* 11/2015
- **Korea Regional Conference Paper Award**, *KICS (Korean Institute of Communications and Information Sciences)* 06/2015
 - Cache Algorithm using User's Context in Smallcell Environments.

R&D Projects

- **End-Edge-Cloud Big-Data Processing for Augmented Reality Applications** 03/2021–Present
 - Funded by *Samsung Advanced Institute of Technology*
- **5G/Unmanned Vehicle Research Center (5G/UV-RC) – University IT Research Center (ITRC)** 06/2020–12/2020
 - Funded by *Institute for Information and Communications Technology Promotion (IITP)*, PI: Hanyang University

International Publications

- **IEEE Journals** ([Review/Revision](#)), Correspondence mark: †

Ph.D. Dissertation

[PhD.01] **S. Jung**, *Energy-Efficient Scheduling and Optimization for Connected and Autonomous Vehicles*, Ph.D. Dissertation (Electrical and Computer Engineering), Ajou University, Suwon, Korea, February 2021.

Magazines and Journals

[J.15.review] **S. Jung**, D. Mohaisen, J. Kim[†], and J.-H. Kim[†], "Truthful and Performance-Optimal Outsourcing Computing for Surveillance Analytics Platforms via Learning-based Auction," *IEEE Internet of Things Journal* (Under Review)., (Special Issue on Secure Data Analytics for Emerging Internet of Things)

- [J.14.review] W. J. Yun, S. Park, J. Kim[†], M. Shin, **S. Jung**[†], D. Mohaisen[†], and J.-H. Kim[†], "Double Blind Review," *IEEE Transactions on Industrial Informatics* (Under Review)., (Special Session on Reliability and Security for Intelligent Wireless Sensing and Control Systems)
- [J.13.review] W. J. Yun, Y. J. Ha, **S. Jung**[†], J. Kim[†], and J.-H. Kim[†], "Multi-Agent Deep Reinforcement Autonomous Drone Mobility Learning for Smart City Services," *IEEE Internet Computing* (Under Review).
- [J.12.major] **S. Jung**, J. Kim[†], M. Levorato, C. Cordeiro, and J.-H. Kim[†], "Infrastructure-Assisted On-Driving Experience Sharing for Millimeter-Wave Connected Vehicles," *IEEE Transactions on Vehicular Technology* (Under Major Revision)., (Connected Vehicles Series: Annual Special Issue/Special Section on Connected Vehicles)
- [J.11.major] **S. Jung**, M. Levorato, J. Kim[†], and J.-H. Kim[†], "Self-Adaptive Learning Outsourcing Decision Making for Edge-Assisted UAV Networks," *IEEE Systems Journal* (Under Major Revision).
- [J.10] D. Kim, S. Park, J. Kim, J. y. Bang, and **S. Jung**[†], "Stabilized Adaptive Sampling Control for Reliable Real-Time Learning-based Surveillance Systems," *IEEE/KICS Journal of Communications and Networks* (Accepted).
- [J.09] **S. Jung**, J. Kim, and J.-H. Kim[†], "Intelligent Active Queue Management for Stabilized QoS Guarantees in 5G Mobile Networks," *IEEE Systems Journal*, v(n):ppp-ppp, June 2021 (Online Published)., DOI: 10.1109/JSYST.2020.3014231
- [J.08] **S. Jung**, W. J. Yun, M. Shin, J. Kim[†], and J.-H. Kim[†], "Orchestrated Scheduling and Multi-Agent Deep Reinforcement Learning for Cloud-Assisted Multi-UAV Charging Systems," *IEEE Transactions on Vehicular Technology* (Accepted)., (Special Section on Vehicular Networks in the era of 6G: End-Edge-Cloud Orchestrated Intelligence), DOI: 10.1109/TVT.2021.3062418
- [J.07] K. Kim, **S. Jung**, and J.-H. Kim[†], "Adaptive Speckle Filtering for Real-time Computing in Low Earth Orbit Satellite Synthetic Aperture Radar," *ICT Express* (Accepted)., (Special Issue on Mobile and Edge Computing Systems), DOI: 10.1016/j.icte.2021.02.003
- [J.06] W. J. Yun, **S. Jung**, J. Kim[†], and J.-H. Kim[†], "Distributed Deep Reinforcement Learning for Autonomous Aerial eVTOL Mobility in Drone Taxi Applications," *ICT Express* (Accepted)., DOI: 10.1016/j.icte.2021.01.005
- [J.05] **S. Jung**, W. J. Yun, J. Kim[†], and J.-H. Kim[†], "Coordinated Multi-Agent Deep Reinforcement Learning for Energy-Aware UAV-based Big-Data Platforms," *Electronics*, 10(5):543, February 2021., (Special Issue on Ultra-Intelligent Computing and Communication for B5G and 6G Networks), DOI: 10.3390/electronics10050543
- [J.04] S. Park, **S. Jung**, H. Lee, J. Kim[†], and J.-H. Kim[†], "Large-Scale Water Quality Prediction using Federated Sensing and Learning: A Case Study with Real-World Sensing Big-Data," *Sensors*, 21(4):1462, February 2021., (Special Issue on Emerging Sensors Techniques and Technologies for Intelligent Environments), DOI: 10.3390/s21041462
- [J.03] **S. Jung**, J. Kim, and J.-H. Kim[†], "Joint Message-Passing and Convex Optimization Framework for Energy-Efficient Surveillance UAV Scheduling," *Electronics*, 9(9):1475, September 2020., (Special Issue on Energy-Aware and Efficient Computing and Communications), DOI: 10.3390/electronics9091475
- [J.02] **S. Jung**, S.-H. Lee, and J.-H. Kim[†], "Reliability Control Framework for Random Access of Massive IoT Devices," *IEEE Access*, 7:49928–49937, April 2019., DOI: 10.1109/ACCESS.2019.2911089
- [J.01] S.-H. Lee, **S. Jung**, and J.-H. Kim[†], "Dynamic Resource Allocation of the Random Access for MTC Devices," *ETRI Journal*, 39(4):546-557, August 2017., DOI: 10.4218/etrij.17.0116.0825

Conferences

- [C.07] G. Lee, W. J. Yun, **S. Jung**[†], J. Kim[†], and J.-H. Kim[†], "Visualization of Deep Reinforcement Autonomous Aerial Mobility Learning Simulations," in *Proc. IEEE International Conference on Computer Communications (INFOCOM)*, Virtual, May 2021. (Demo Abstract)
- [C.06] **S. Jung**, W. J. Yun, J. Kim[†], and J.-H. Kim[†], "Infrastructure-Assisted Cooperative Multi-UAV Deep Reinforcement Energy Trading Learning for Big-Data Processing," in *Proc. IEEE International Conference on Information Networking (ICOIN)*, Jeju, Korea, January 2021.
- [C.05] **S. Jung**, P. Yeng, T. Q. S. Quek, and J.-H. Kim, "Belief Propagation based Scheduling for Energy Efficient Multi-drone Monitoring System," in *Proc. IEEE International Conference on ICT Convergence (ICTC)*, Jeju, Korea, October 2020.
- [C.04] **S. Jung**, H.-R. Cheon, and J.-H. Kim, "Reducing Consecutive Collisions in Sensing Based Semi Persistent Scheduling for Cellular-V2X," in *Proc. IEEE Vehicular Technology Conference (VTC-Fall)*, Hawaii, USA, September 2019.
- [C.03] S.-H. Lee, **S. Jung**, and J.-H. Kim, "Adaptive Resource Allocation and Congestion Control Algorithm for Massive Devices in LTE-A," in *Proc. IEEE Wireless Communications and Networking Conference (WCNC)*, Barcelona, Spain, April 2018.
- [C.02] S.-S. Yoo, S.-H. Lee, **S. Jung**, and J.-H. Kim, "Performance Evaluation of Random Access Response Estimation Scheme for IoT Communications," in *Proc. IEEE International Conference on Communications (ICC)*, Paris, France, May 2017.
- [C.01] J.-K. Kim, **S. Jung**, K.-H. Lee, and J.-H. Kim, "Frame Aggregation Scheme based on Voice Quality in VoIP System," in *Proc. International Conference on Electronics, Information, and Communication (ICEIC)*, Bali, Indonesia, January 2013.

Teaching Experience

Seoul Women's University – Department of Information Security, *Part-Time Lecturer*

- **Undergraduate Courses:** *Computer Architecture* (Spring 2021), *Introduction to Computer and Information Security* (Spring 2021), *Computer Algorithm* (Fall 2020), *Digital Forensics* (Fall 2020)
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Professional Activities

Talks and Presentations

Universities

- *Energy-Efficient Scheduling and Optimization for Connected and Autonomous Vehicles*; **Korea University** (Seoul, Korea, 03/2021)

Academic Societies

- *Research Trends in Connected and Autonomous Vehicle (CAV) Scheduling and Optimization*; **OSIA Workshop** (Seoul, Korea, 04/2021)
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References

- **Prof. Jae-Hyun Kim**, *Ph.D. Research and Dissertation Advisor*
 - Professor at the Department of Electrical and Computer Engineering, Ajou University (Suwon, Republic of Korea)
 - URL: <http://winner.ajou.ac.kr>
 - E-mail: jkim@ajou.ac.kr
- **Prof. Joongheon Kim**, *Postdoctoral Research Supervisor*
 - Professor at the School of Electrical Engineering, Korea University (Seoul, Republic of Korea)
 - URL: <https://joongheon.github.io>
 - E-mail: joongheon@korea.ac.kr
- **Prof. Marco Levorato**, *Postdoctoral Research Supervisor*
 - Professor at the Donald Bren School of Information and Computer Sciences, University of California at Irvine (Irvine, California, USA)
 - URL: <https://www.ics.uci.edu/~mlevorat>
 - E-mail: levorato@uci.edu