

# Soyi Jung

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## Research Interests

- **Connected and Autonomous Vehicles:** Unmanned Aerial Vehicles, Autonomous Driving
- **Intelligent and Trust Computing:** Optimal Auction through Deep Learning
- **Distributed Systems Design and Analysis:** Lyapunov Optimization, Queuing Theory

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## Educational Backgrounds

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

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## R&D Positions

- **Hallym University – School of Software**, Chuncheon, Republic of Korea
  - Assistant Professor (09/2021–Present)
- **University of California at Irvine – Donald Bren School of Information and Computer Sciences**, Irvine, CA, USA
  - Postdoctoral Scholar at UC-Irvine (09/2021–Present), Advisor: Prof. Marco Levorato
- **Korea University – School of Electrical Engineering**, Seoul, Republic of Korea
  - Research Professor at Korea University (03/2021–08/2021), Advisor: Prof. Joongheon Kim
  - Co-director at Artificial Intelligence and Mobility (AIM) Lab (03/2021–08/2021), Advisor: Prof. Joongheon Kim
- **Korea Testing and Research (KTR) Institute**, Gwacheon, Republic of Korea
  - Researcher (03/2015–02/2016)

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## Project (Selected: Primary PI)

- **Fundamental Research on LEO Satellite Access Protocols in Non-Territorial Networks** 04/2021–11/2021  
*Electronics and Telecommunications Research Institute (ETRI) [ETRI (21ZH1100), Grant: \$50,000; Primary PI]*

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## 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, WISNET** (*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.

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## International Publications

### 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.13] **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* (Online Published).
- [J.12] **S. Jung** and J. Kim\*, "Adaptive and Stabilized Real-Time Super-Resolution Control for UAV-Assisted Smart Harbor Surveillance Platforms," *Journal of Real-Time Image Processing* (Accepted).

- [J.11] **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, September 2021 (Online Published).
- [J.10] **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*, 70(6):5362–5377, June 2021.
- [J.09] H. Lee, **S. Jung\***, and J. Kim, "Truthful Electric Vehicle Charging via Neural-Architectural Myerson Auction," *ICT Express*, 7(2):196–199, June 2021.
- [J.08] 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*, 7(2):187–190, June 2021.
- [J.07] 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*, 23(2):128–136, April 2021.
- [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*, 7(1):1–4, March 2021.
- [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.
- [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.
- [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.
- [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.
- [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.

## Conferences

- [C.16] W.J. Yun, B. Lim, **S. Jung**, Y.-C. Ko, J. Park\*, J. Kim\*, and M. Bennis, "Attention-based Reinforcement Learning for Real-Time UAV Semantic Communication" *IEEE International Symposium on Wireless Communication Systems (ISWCS)*, Berlin, Germany, September 2021.
- [C.15] H. Lee, **S. Jung\***, and J. Kim\*, "Distributed and Autonomous Aerial Data Collection in Smart City Surveillance Applications" *IEEE VTS Asia Pacific Wireless Communications Symposium (APWCS)*, Virtual, August 2021.
- [C.14] J. Kim, Y. Kwak, J. Choi, **S. Jung\***, and J. Kim\*, "Quantum Scheduling for Millimeter-Wave Observation Satellite Constellation" *IEEE VTS Asia Pacific Wireless Communications Symposium (APWCS)*, Virtual, August 2021.
- [C.13] Y.J. Ha, M. Yoo, S. Park, **S. Jung**, and J. Kim\*, "Secure Aerial Surveillance using Split Learning," *IEEE International Conference on Ubiquitous and Future Networks (ICUFN)*, Jeju Korea, August 2021.
- [C.12] H. Baek, W.J. Yun, **S. Jung**, M. Ji, J. Kim\*, J. Park\*, and M. Bennis, "Communication and Energy Efficient Slimmable Federated Learning via Superposition Coding and Successive Decoding," *International Conference on Machine Learning (ICML) (Workshop on Federated Learning for User Privacy and Data Confidentiality)*, Virtual, July 2021.
- [C.11] J. Kim, S. Park, **S. Jung\***, and S. Yoo\*, "Spatio-Temporal Split Learning," *IEEE/IFIP International Conference on Dependable Systems and Networks (DSN)*, Virtual, June 2021. (Supplemental Volume)
- [C.10] H. Baek, Y.J. Ha, **S. Jung\***, and J. Kim\*, "Noise Rejection in mmWave Radar Images using Deep Learning Image Processing Methods," *IEEE International Technical Conference on Circuits/Systems, Computers and Communications (ITC-CSCC)*, Jeju Korea, June 2021.
- [C.09] M. Yoo, Y.J. Ha, **S. Jung\***, and J. Kim\*, "CNN-based Hand Gesture Recognition Using mmWave Radar," *IEEE International Technical Conference on Circuits/Systems, Computers and Communications (ITC-CSCC)*, Jeju Korea, June 2021.
- [C.08] H. Lee **S. Jung\***, and J. Kim\*, "Deep Learning Auction for Truthful Secure UAV Networking," *IEEE International Technical Conference on Circuits/Systems, Computers and Communications (ITC-CSCC)*, Jeju Korea, June 2021.
- [C.07] G. Lee, W. J. Yun, **S. Jung\***, J. Kim\*, and J.-H. Kim\*, "Visualization of Deep Reinforcement Autonomous Aerial Mobility Learning Simulations," *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," *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," *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," *IEEE Vehicular Technology Conference (VTC)*, 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," *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," *IEEE International Conference on Communications (ICC)*, Paris, France, May 2017.

## Teaching Experience

Hallym University – School of Software, *Assistant Professor*

- **Undergraduate Courses:** *Computer Architecture* (Fall 2021), *Algorithm* (Fall 2021)

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 Algorithms* (Fall 2020), *Digital Forensics* (Fall 2020)
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## Professional Activities

Talks and Presentations

### Academic Societies

- *Split Learning Technology Trends: Focusing on Medical AI Applications*; **KICS Workshop** (Seoul, Korea, 08/2021)
- *Research Trends in Connected and Autonomous Vehicle (CAV) Scheduling and Optimization*; **OSIA Workshop** (Seoul, Korea, 04/2021)

### Universities

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