Dr. Soyi Jung

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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)
  – *Research Professor at Korea University Artificial Intelligence and Mobility Lab* (*03/2021–Present*), Advisor: Prof. Joongheon Kim
  – *Postdoctoral Scholar at UC-Irvine* (*03/2021–Present*), Advisor: Prof. Marco Levorato
- **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**, *KIISE* (*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**, *WISET* (*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

- 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] 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* (Under Review)., (Special Issue on Mobile and Edge Computing Systems)

[J.14.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.13.review] M. Shin, W. J. Yun, **S. Jung**†, S. Park, D. Mohaisen, J. Kim†, and J.-H. Kim†, "Cooperative Multi-Agent Deep Reinforcement Learning for Autonomous Surveillance Drones," *IEEE Transactions on Vehicular Technology* (Under Review).

[J.12.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 Vehicular Technology Magazine* (Under Review)., (Special Issue on Advanced Aerial Mobility)

[J.11.revision] **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.10.revision] 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* (Under Major Revision).

[J.09.revision] M. Shin, **S. Jung**†, J. Kim, and W. Lee†, "Millimeter-Wave Beam Trading for Smart Ocean IoT Networks via Learning-Assisted Auction," *IEEE/KICS Journal of Communications and Networks* (Under Major Revision).

[J.08.revision] **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.07.revision] 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 Green Tide Big-Data," *Sensors* (Under Major Revision)., (Special Issue on Emerging Sensors Techniques and Technologies for Intelligent Environments)

[J.06.revision] **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* (Major Revision Completed)., (Special Section on Vehicular Networks in the era of 6G: End-Edge-Cloud Orchestrated Intelligence)

[J.05] 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).

[J.04] **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.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., 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.review] 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)

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
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- **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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