

**Associate Professor**, Korea University – School of Electrical Engineering, Seoul, Republic of Korea

**Associate Editor**, *IEEE Transactions on Vehicular Technology*

• Email: [joongheon@korea.ac.kr](mailto:joongheon@korea.ac.kr) • WWW: <https://joongheon.github.io>

## Positions

### Korea University

- **Associate Professor – Faculty Member (09/2019–): School of Electrical Engineering**
  - *Director (09/2019–):* Artificial Intelligence and Mobility (AIM) Laboratory
  - *Adjunct Professor (03/2021–):* Department of Semiconductor Engineering
- **Vice Director (10/2019–):** Artificial Intelligence Engineering Research Center
- **Organizing Committee (07/2021–06/2022):** Institute of Data Science (IDS)
- **Affiliated Faculty Member (09/2019–):** Future Network Center

### Academia

- **Senior Member (2018–), IEEE**
  - *Member:* IEEE Communications Society, IEEE Vehicular Technology Society, etc
- **Life Member (2018–), Korean Institute of Communications and Information Sciences (KICS)**
- **Life Member (2019–), Korean Institute of Information Scientists and Engineers (KIISE)**
- **Associate Editor (2020–), IEEE Transactions on Vehicular Technology**

## Educational Backgrounds

- **University of Southern California (USC) – Viterbi School of Engineering**, Los Angeles, California, USA
  - Ph.D. (08/2009–08/2014) in Computer Science (Advisor: *Prof. Andreas F. Molisch*, Department of Electrical Engineering)
  - M.S. (05/2014) in Computer Science with specialization in High Performance Computing and Simulations
  - M.S. (05/2012) in Electrical Engineering
- **Korea University**, Seoul, Republic of Korea
  - M.S. (03/2004–02/2006) in Computer Science and Engineering (Advisor: *Prof. Wonjun Lee*, School of Information Security)
  - B.S. (03/1999–02/2004) in Computer Science and Engineering

## Awards and Honors

### Research and Academic Excellence (International)

- **Best Paper Award** – 2021 *IEEE International Conference on Information Networking (ICOIN)* 01/2021  
"Infrastructure-Assisted Cooperative Multi-UAV Deep Reinforcement Energy Trading Learning for Big-Data Processing"
- **Bronze Paper Award** – 2020 *IEEE Seoul Section Student Paper Contest* 12/2020  
"Reliable Offloading Target Selection using Deep Reinforcement Learning for Large Fire Accident"
- **IEEE Systems Journal Best Paper Award (Top 7 among 793 accepted papers in 2019: 0.88%)** – *IEEE Systems Council* 03/2020  
"Towards Characterizing Blockchain-based Cryptocurrencies for Highly-Accurate Predictions"
- **Gold Paper Award** – 2019 *IEEE Seoul Section Student Paper Contest* 12/2019  
"Stabilized Super-Resolution Deep Learning Adaptation for UAV-Assisted Mobile Edges: A Lyapunov Optimization Approach"
- **IEEE Vehicular Technology Society (VTS) Seoul Chapter Award** – 2019 *IEEE Asia Pacific Wireless Communications Symposium* 08/2019  
"Joint Offloading and Streaming in Mobile Edges: A Deep Reinforcement Learning Approach"
- **Next Generation and Standards (NGS) Division Recognition Award** – *Intel Corporation* Q1/2015  
For developing a 3-dual sector mmWave backhaul link software stack with mesh, relay, and load balancing capability for modular antenna array (MAA) proof-of-concept (POC)
- **Annenberg Graduate Fellowship Award** – *University of Southern California* 02/2009  
Awarded with Ph.D. Admission – 4 Year Full Scholarship (\$30,000/year for 4 years, i.e., \$120,000)

### Research and Academic Excellence (Korea Regional)

- **Encouragement Paper Award** – 2020 *KICS Summer Conference* 08/2020  
"3D Modeling and WebVR Implementation Using Azure Kinect, Open3D, and Three.js"
- **Encouragement Paper Award** – 2020 *KICS Winter Conference* 02/2020  
"Quantum Heuristic Solver using QAOA for the Maximum Independent Set Problem"
- **Encouragement Paper Award** – 2020 *KICS Winter Conference* 02/2020  
"Multi-Drone Scheduling for High-Reliable and High-Performance UAV-based Surveillance Networking"
- **Outstanding Contribution Award** – *KICS* 11/2019
- **Haedong Young Scholar Award** – *KICS and Haedong Foundation* 12/2018  
For recognizing a researcher under the age of 40 who has made outstanding contributions to communication sciences R&D
- **Outstanding Research Paper Award** – *LG Electronics CTO Office, Multimedia Research Laboratory* 01/2008
- **RFID Expert Group President Award** – *The 3rd RFID/USN Research Paper Contest* 10/2007
- **ETRI President Award** – *The 2nd RFID/USN Research Paper Contest* 11/2006
- **Korea Association of RFID/USN (KARUS) President Award** – *The 1st RFID/USN Research Paper Contest* 10/2005
- **Scholarships for Academic Excellence** – *Korea University* Fall 1999, Fall 2000

## Teaching and Supervision Excellence

- **Granite Tower (Seok-Tap) Best Teaching Award** – Korea University (Computer Language and Laboratory, EGRN151) Fall 2019
- **Excellence in Teaching** – Chung-Ang University Fall 2018, Fall 2017, Fall 2016
- **Certificate of Achievement (13th Place)** – ACM International Collegiate Programming Contest (ICPC) 11/2016

## R&D Positions

### Full-Time Positions

- **Korea University – College of Engineering**, Seoul, Republic of Korea
  - Associate Professor (03/2021–), School of Electrical Engineering
  - Adjunct Professor (03/2021–), Department of Semiconductor Engineering
  - Assistant Professor (09/2019–02/2021), School of Electrical Engineering
- **Chung-Ang University – College of Computer Science and Software**, Seoul, Republic of Korea
  - Assistant Professor (03/2016–08/2019), School of Computer Science and Engineering
- **Intel Corporation – Platform Engineering Group**, Silicon Valley (Santa Clara), California, USA
  - Systems Engineer (09/2013–02/2016), mmWave Standards and Advanced Technology (mSAT) Team (with Dr. Ali S. Sadri)
- **University of Southern California (USC) – Viterbi School of Engineering**, Los Angeles, California, USA
  - Annenberg Graduate Fellow (08/2009), Awarded with Ph.D. admission from USC (2009)
  - Ph.D. Research Assistant (01/2011–08/2014), Communication Sciences Institute (Advised by Prof. Andreas F. Molisch)
- **InterDigital**, San Diego, California, USA
  - Intern (05/2012–08/2012), Wireless Systems Evolution Department
- **LG Electronics CTO Office**, Seoul, Republic of Korea
  - Research Engineer (01/2006–08/2009), Multimedia Research Laboratory, Seocho R&D Campus
- **Korea University – Department of Computer Science and Engineering**, Seoul, Republic of Korea
  - M.S. Research/Teaching Assistant (03/2004–02/2006), Network Research Laboratory (Advised by Prof. Wonjun Lee)

### Consulting Positions

- **Samsung SDS** (05/2020–08/2020), Object Removal Deep Learning Algorithm Design and Implementation
- **Samsung Electronics** (02/2020–08/2020), Nonlinear Regression Deep Learning Algorithm Design and Implementation

## R&D Projects

### University/Center-Level Projects

- **Special Research Center for Micro UAV Networks** 10/2020–12/2022
  - Funded by Agency for Defense Development (ADD)
  - ADD Military Special Research Center, PI: Kwangwoon University (Korea)
- **5G/Unmanned Vehicle Research Center (5G/UV-RC)** 06/2020–12/2020
  - Funded by Institute for Information and Communications Technology Promotion (IITP)
  - University IT Research Center (ITRC), PI: Hanyang University (Korea)
- **Human Resource Development for the Biomedical Unstructured Big Data Analysis** 08/2018–12/2021
  - Funded by Institute for Information and Communications Technology Promotion (IITP) [2018-0-01833; Co-PI]
  - University IT Research Center (ITRC), PI: Seoul National University Hospital (Korea)
- **Intelligent Internet of Energy (IoE) Data Research Center** 02/2020–05/2020
  - Funded by Institute for Information and Communications Technology Promotion (IITP)
  - University IT Research Center (ITRC), PI: Kookmin University (Korea)

### Government-Funded Projects

- **Integrated Perception Technology Developments for Public Safety Platforms** 06/2019–05/2023
  - Funded by National Research Foundation of Korea [2019M3E3A1084054, Grant: \$400,000; Co-PI]
- **Development of Quantum Deep Reinforcement Learning Algorithm using QAOA** 10/2019–04/2022
  - Funded by Ministry of Science and ICT [2019M3E4A1080391, Grant: \$258,500; Primary-PI]
- **Distributed Secure Platform for Scalable Clinical OMOP CDM Models** 04/2019–03/2022
  - Funded by Ministry of Health and Welfare [HI19C0572, Grant: \$90,000; Co-PI]
- **mmWave Radar and Deep Reinforcement Learning based Optimal Policy Autonomous Driving** 06/2019–02/2022
  - Funded by National Research Foundation of Korea [2019R1A2C4070663, Grant: \$275,000; Primary-PI]
- **Development of Privacy-Reinforcing Distributed Transfer-Iterative Learning Algorithm** 07/2019–12/2021
  - Funded by Ministry of Health and Welfare [HI19C0842, Grant: \$150,000; Co-PI]
- **Virtual Presence in Moving Objects through 5G (PriMO-5G)** 06/2018–05/2021
  - Funded by Institute for Information and Communications Technology Promotion (IITP) [2018-0-00170, Grant: \$246,464; Co-PI]
- **Network Engineering: Development and Application of Novel Data Science Driven Framework for Efficient Network Design** 06/2017–05/2020
  - Funded by National Research Foundation of Korea (Basic Research Lab) [2017R1A4A1015675, Grant: \$150,000; Co-PI]
- **mmWave High-Speed Networking Platform Design for Next-Generation Convergence Services** 06/2016–05/2019
  - Funded by National Research Foundation of Korea [2016R1C1B1015406, Grant: \$150,000; Primary-PI]
  - Selected as Initial Innovation Lab [Grant: \$60,000]
- **Feasibility Study of 60 GHz IEEE 802.11ad for Virtual Reality (VR) Platforms** 04/2017–12/2017
  - Funded by Institute for Information and Communications Technology Promotion (IITP) [Grant: \$33,333; Primary-PI]

### Industry-Funded Projects

- **Mapping between Real World and Virtual Reality (VR) for End-Edged Cloud Real-Time VR Servers** 09/2020–09/2021  
Funded by *Samsung Electronics – Samsung Advanced Institute of Technology* [Grant: \$71,500; Primary-PI]
- **Super-Resolution Performance Optimization in Mobile Platforms** 05/2020–08/2020  
Funded by *Samsung SDS* [Grant: \$15,000; Primary-PI]
- **Deep Learning Algorithms for mVOC Concentration Analysis** 03/2020–06/2020  
Funded by *Samsung Electronics* [Grant: \$12,000; Primary-PI]
- **Visual Recognition Software Implementation using Deep Learning Tools** 05/2019–11/2019  
Funded by *Hyundai NGV* and *Hyundai/Kia Motors Company* [Grant: \$59,500; Primary-PI]
- **A Priori Techniques Research for Efficient Multi-Edge Computing** 06/2017–12/2017  
Funded by *Samsung Electronics Software Center* [Grant: \$80,000; Co-PI]

#### Government-Funded Research Institute Projects

- **Multi-GPU based Automotive HPC Platform Development** 04/2020–10/2020  
(A Development of Driving Decision Engine for Autonomous Driving using Driving Experience Information)  
Funded by *Electronics and Telecommunications Research Institute* [19HS2720 (IITP 2017-0-00068), Grant: \$20,000; Primary-PI]
- **Cooperative Deep Reinforcement Learning for Online Game Multi-Agents** 04/2020–08/2020  
(Human-Agent Cooperation Algorithm Design in Multi-Agent Environment)  
Funded by *Electronics and Telecommunications Research Institute* [19YE1400, Grant: \$28,000; Primary-PI]
- **Verification Testbed Implementation for Privacy-Preserving Trust Data Generation** 10/2019–11/2019  
Funded by *Electronics and Telecommunications Research Institute* [Grant: \$44,000; Co-PI]
- **Measurement and Analysis of Multi-Task GPU Scheduling Delays** 05/2019–10/2019  
(A Development of Driving Decision Engine for Autonomous Driving using Driving Experience Information)  
Funded by *Electronics and Telecommunications Research Institute* [19HS2720 (IITP 2017-0-00068), Grant: \$40,000; Primary-PI]
- **Probabilistic Decision Making and Econometric Methods for Micro-Grid** 05/2017–04/2019  
Funded by *Korea Electric Power Corporation (KEPCO) Research Institute* [R17XA05-41, Grant: \$143,128; Primary-PI]
- **GPU Scheduling Performance Analysis under Queueing Delay Considerations** 05/2018–10/2018  
(A Development of Driving Decision Engine for Autonomous Driving using Driving Experience Information)  
Funded by *Electronics and Telecommunications Research Institute* [18HS1420 (IITP 2017-0-00068), Grant: \$40,000; Primary-PI]
- **Improving Massive Deep Learning Training via Computation and Communication Acceleration** 04/2018–10/2018  
(Development of HPC System for Accelerating Large-Scale Deep Learning)  
Funded by *Electronics and Telecommunications Research Institute* [18HS1710 (IITP 2016-0-00087), Grant: \$30,000; Primary-PI]
- **Parsing Techniques for Artificial Neural Network (ANN) Data Processing** 09/2017–11/2017  
(A Development of Driving Decision Engine for Autonomous Driving using Driving Experience Information)  
Funded by *Electronics and Telecommunications Research Institute* [17HS2720 (IITP 2017-0-00068), Grant: \$40,000; Primary-PI]

#### University of Southern California (USC) – Viterbi School of Engineering (Ph.D. Research Projects)

- **Video Aware Wireless Networks (VAWN) Research Program**  
Funded by *Intel Labs*, *Verizon Wireless*, and *Cisco Systems*; Under the guidance of Prof. Andreas F. Molisch (University of Southern California, USA) and Prof. Giuseppe Caire (Technische Universität Berlin, Germany)
- **60 GHz Real-Time Wireless Video Broadcasting**  
Supported by a Gift from *Disney Research Zürich*; Under the guidance of Prof. Andreas F. Molisch (University of Southern California, USA), Prof. Yafei Tian (Beihang Univ, China), and Dr. Stefan Mangold (Disney Research Zürich, Switzerland)

### Selected Publications

- Citation: 3737+, H-Index: 26+, i10-Index: 93+; obtained from Google Scholar Profile (as of December 26, 2020)

### Dissertation, Books, and Book Chapters

#### Ph.D. Dissertation

- *Elements of Next-Generation Wireless Video Systems: Millimeter-Wave and Device-to-Device Algorithms*, Ph.D. Dissertation (Computer Science), University of Southern California, Los Angeles, California, USA, August 2014.

#### Book Chapters

- Dynamic Decision-Making for Stabilized Deep Learning Software Platforms, *Advances and Applications in Deep Learning (Artificial Intelligence Book Series)*, IntechOpen, September 2020., (Editor: M.A. Aceves-Fernandez) (w/ S. Park, D. Kim)
- Device-to-Device Communications, *Towards 5G: Applications, Requirements and Candidate Technologies*, Wiley, January 2017., (Editors: R. Vannithamby, S. Talwar) (w/ A.F. Molisch, M. Ji, D. Burghal, A.S. Tehrani)
- Millimeter-Wave (mmWave) Medium Access Control: A Survey, *Opportunities in 5G Networks: A Research and Development Perspective*, CRC Press Taylor and Francis Group, April 2016., (Editor: F. Hu)
- Millimeter-Wave (mmWave) Radio Propagation Characteristics, *Opportunities in 5G Networks: A Research and Development Perspective*, CRC Press Taylor and Francis Group, April 2016., (Editor: F. Hu)
- Weighted Localized Clustering: A Coverage-Aware Reader Collision Arbitration Protocol in RFID Networks, *Handbook on Mobile and Ubiquitous Computing: Status and Perspective*, CRC Press Taylor and Francis Group, October 2012., (Editors: L.T. Yang, E. Syukur, S.W. Loke) (w/ E. Kim, W. Lee, D. Kim, J. Choi, J. Jung, C.K. Shin)
- Coverage-Time Optimized Dynamic Clustering for Two-Tiered WM2Nets, *Wireless Mesh Networking*, McGraw-Hill, August 2008., (Editor: G. Aggelou) (w/ W. Lee, E. Kim, T.K. Shih)

### Magazines and Journals

- IEEE/ACM/Representative – 46 publications

- [TVT.major] Orchestrated Scheduling and Multi-Agent Deep Reinforcement Learning for Cloud-Assisted Multi-UAV Charging Systems, *IEEE Transactions on Vehicular Technology*, (major revision). (w/ S. Jung, W.J. Yun, M. Shin, J.-H. Kim)
- [PIEEE.major] Communication-Efficient and Distributed Learning Over Wireless Networks: Principles and Applications, *Proceedings of the IEEE*, (major revision). (w/ J. Park, S. Samarakoon, A. Elgabli, M. Bennis, S.-L. Kim, M. Debbah)
- [ISJ.major] Joint Mobile Charging and Coverage-Time Extension for Unmanned Aerial Vehicles, *IEEE Systems Journal*, (major revision). (w/ S. Park, S. Park, M. Choi, W.-Y. Shin)
- [JCN.minor] Stabilized Adaptive Sampling Control for Reliable Real-Time Learning-based Surveillance Systems, *Journal of Communications and Networks*, (minor revision). (w/ D. Kim, S. Park, J.y. Bang, S. Jung)
- [TWC.accept] Probabilistic Caching and Dynamic Delivery Policies for Categorized Contents and Consecutive User Demands, *IEEE Transactions on Wireless Communications*, (major revision). (w/ M. Choi, A.F. Molisch, D.-J. Han, D. Kim, J. Moon)
- [TMC.accept] Supremo: Cloud-Assisted Low-Latency Super-Resolution in Mobile Devices, *IEEE Transactions on Mobile Computing*, v(n):ppp-ppp, Month Year. (w/ J. Yi, S. Kim, S. Choi)
- [TMC.accept] A Personalized Preference Learning Framework for Caching in Mobile Networks, *IEEE Transactions on Mobile Computing*, v(n):ppp-ppp, Month Year. (w/ A. Malik, K.S. Kim, W.-Y. Shin)
- [ISJ.accept] LiteZKP: Lightning Zero-Knowledge Proof-based Blockchains for IoT and Edge Platforms, *IEEE Systems Journal*, v(n):ppp-ppp, Month Year. (w/ E. Boo, J. Ko)
- [ISJ.accept] Intelligent Active Queue Management for Stabilized QoS Guarantees in 5G Mobile Networks, *IEEE Systems Journal*, 15(2):ppp-ppp, June 2021. (w/ S. Jung, J.-H. Kim)
- [ISJ.accept] Multiscale LSTM-Based Deep Learning for Very-Short-Term Photovoltaic Power Generation Forecasting in Smart City Energy Management, *IEEE Systems Journal*, 15(2):ppp-ppp, June 2021. (w/ D. Kim, D. Kwon, L. Park, S. Cho)
- [JCN.accept] Dynamic Video Delivery using Deep Reinforcement Learning for Device-to-Device Underlaid Internet-of-Vehicle Caching Networks, *Journal of Communications and Networks*, v(n):ppp-ppp, Month Year. (w/ M. Choi, M. Shin)
- [TWC'20.12] Joint Distributed Link Scheduling and Power Allocation for Content Delivery in Wireless Caching Networks, *IEEE Transactions on Wireless Communications*, 19(12):7810–7824, December 2020. (w/ M. Choi, A.F. Molisch)
- [IOTJ'20.10] Multiagent DDPG-Based Deep Learning for Smart Ocean Federated Learning IoT Networks, *IEEE Internet of Things Journal*, 7(10):9895–9903, October 2020. (w/ D. Kwon, J. Jeon, S. Park, S. Cho)
- [JCN'20.08] Self-Adaptive Power Control with Deep Reinforcement Learning for Millimeter-Wave Internet-of-Vehicles Video Caching, *Journal of Communications and Networks*, 22(4):326–337, August 2020. (w/ D. Kwon, D. Mohaisen, W. Lee)
- [Access'20.06] Blind Signal Classification Analysis and Impact on User Pairing and Power Allocation in Nonorthogonal Multiple Access, *IEEE Access*, 8:100916–100929, June 2020. (w/ M. Choi)
- [TII'20.05] Cooperative Management for PV/ESS-Enabled Electric-Vehicle Charging Stations: A Multiagent Deep Reinforcement Learning Approach, *IEEE Transactions on Industrial Informatics*, 16(5):3493–3503, May 2020. (w/ M. Shin, D.-H. Choi)
- [ISJ'20.03] Towards Characterizing Blockchain-based Cryptocurrencies for Highly-Accurate Predictions, *IEEE Systems Journal*, 14(1):321–332, March 2020. (w/ M. Saad, J. Choi, D. Nyang, A. Mohaisen), ([IEEE Systems Journal Best Paper Award, Top 7 among 793 accepted papers in 2019: 0.88%](#))
- [JCN'20.02] Numerical Approximation of Millimeter-Wave Frequency Sharing between Cellular Systems and Fixed Service Systems, *Journal of Communications and Networks*, 22(1):37–45, February 2020. (w/ S. Han, J.-W. Choi)
- [TWC'19.12] Markov Decision Policies for Dynamic Video Delivery in Wireless Caching Networks, *IEEE Transactions on Wireless Communications*, 18(12):5705–5718, December 2019. (w/ M. Choi, A. No, M. Ji), ([Reviewed by IEEE Communications Society MMTC Communications - Review, 11\(3\)5–6, June 2020 \(Cache-Assisted Dynamic Video Delivery for Mobile Users, Edited by Cong Shen\)](#))
- [TWC'19.10] Dynamic Power Allocation and User Scheduling for Power-Efficient and Delay-Constrained Multiple Access Networks, *IEEE Transactions on Wireless Communications*, 18(10):4846–4858, October 2019. (w/ M. Choi, J. Moon)
- [IOTJ'19.10] Two-Stage IoT Device Scheduling with Dynamic Programming for Energy Internet Systems, *IEEE Internet of Things Journal*, 6(5):8782–8791, October 2019. (w/ L. Park, C. Lee, A. Mohaisen, S. Cho)
- [TVT'19.10] Blind Signal Classification for Non-Orthogonal Multiple Access in Vehicular Networks, *IEEE Transactions on Vehicular Technology*, 68(10):9722–9734, October 2019. (w/ M. Choi, D. Yoon)
- [TCAD'19.09] TEI-ULP: Exploiting Body Biasing to Improve the TEI-Aware Ultra-Low Power Methods, *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, 38(9):1758–1770, September 2019. (w/ W. Lee, T. Kang, J.-J. Lee, K. Han, M. Pedram)
- [TMC'19.07] Seamless Dynamic Adaptive Streaming in LTE/Wi-Fi Integrated Network under Smartphone Resource Constraints, *IEEE Transactions on Mobile Computing*, 18(7):1647–1660, July 2019. (w/ J. Koo, J. Yi, M.A. Hoque, S. Choi)
- [TVT'19.05] Auction-Based Charging Scheduling With Deep Learning Framework for Multi-Drone Networks, *IEEE Transactions on Vehicular Technology*, 68(5):4235–4248, May 2019. (w/ M. Shin, M. Levorato)
- [CM'19.03] New Challenges of Wireless Power Transfer and Secured Billing for Internet of Electric Vehicles, *IEEE Communications Magazine*, 57(3):118–124, March 2019. (w/ L. Park, S. Jeong, D.S. Lakew, S. Cho)
- [TIE'19.02] Joint Geometric Unsupervised Learning and Truthful Auction for Local Energy Market, *IEEE Transactions on Industrial Electronics*, 66(2):1499–1508, February 2019. (w/ L. Park, S. Jeong, S. Cho)
- [IOTJ'18.12] Internet of Things for Smart Manufacturing System: Trust Issues in Resource Allocation, *IEEE Internet of Things Journal*, 5(6):4418–4427, December 2018. (w/ S. Jeong, W. Na, S. Cho)
- [JSAC'18.11] SGCO: Stabilized Green Crosshaul Orchestration for Dense IoT Offloading Services, *IEEE Journal on Selected Areas in Communications*, 36(11):2538–2548, November 2018. (w/ N.-N. Dao, D.-N. Vu, W. Na, S. Cho)
- [JSAC'18.06] Wireless Video Caching and Dynamic Streaming under Differentiated Quality Requirements, *IEEE Journal on Selected Areas in Communications*, 36(6):1245–1257, June 2018. (w/ M. Choi, J. Moon)



- [Access'18.05] Soft Memory Box: A Virtual Shared Memory Framework for Fast Deep Neural Network Training in Distributed High Performance Computing, *IEEE Access*, 6:26493–26504, May 2018. (w/ S. Ahn, E. Lim, S. Kang)
- [TVT'18.04] Adaptive Detector Selection for Queue-Stable Word Error Rate Minimization in Connected Vehicle Receiver Design, *IEEE Transactions on Vehicular Technology*, 67(4):3635–3639, April 2018. (w/ M. Choi, J. Moon)
- [IOTJ'18.02] Energy-Efficient Mobile Charging for Wireless Power Transfer in Internet of Things Networks, *IEEE Internet of Things Journal*, 5(1):79–92, February 2018. (w/ W. Na, J. Park, C. Lee, K. Park, S. Cho)
- [TII'17.12] Residential Demand Response for Renewable Energy Resources in Smart Grid Systems, *IEEE Transactions on Industrial Informatics*, 13(6):3165–3173, December 2017. (w/ L. Park, Y. Jang, S. Cho)
- [IOTJ'17.10] Feasibility Study of 60 GHz Millimeter-Wave Technologies for Hyperconnected Fog Computing Applications, *IEEE Internet of Things Journal*, 4(5):1165–1173, October 2017. (w/ W. Lee)
- [Access'17.09] A Software-based Monitoring Framework for Time-Space Partitioned Avionics Systems, *IEEE Access*, 5:19132–19143, September 2017. (w/ C. Shin, C. Lim, H. Roh, W. Lee)
- [Access'17.08] Energy-Efficient Stabilized Automatic Control for Multicore Baseband in Millimeter-Wave Systems, *IEEE Access*, 5:16584–16591, August 2017. (w/ J.-J. Lee, J.-K. Kim, W. Lee)
- [Access'17.06] Adaptive Resource Balancing for Serviceability Maximization in Fog Radio Access Networks, *IEEE Access*, 5:14548–14559, June 2017. (w/ N.-N. Dao, J. Lee, D.-N. Vu, J. Paek, S. Cho, K. Chung, C. Keum)
- [VTM'17.03] The Useful Impact of Carrier Aggregation: A Measurement Study in South Korea for Commercial LTE-Advanced Networks, *IEEE Vehicular Technology Magazine*, 12(1):55–62, March 2017. (w/ S. Lee, S. Hyeon, H. Roh, W. Lee)
- [TVT'16.12] Performance of Video Streaming in Infrastructure-to-Vehicle Telematic Platforms With 60-GHz Radiation and IEEE 802.11ad Baseband, *IEEE Transactions on Vehicular Technology*, 65(12):10111–10115, December 2016. (w/ S.-C. Kwon, G. Choi)
- [Access'16.12] Numerical Simulation Study for Frequency Sharing between Micro-Cellular Systems and Fixed Service Systems in Millimeter-Wave Bands, *IEEE Access*, 4:9847–9859, December 2016. (w/ L. Xian, A.S. Sadri)
- [TON'16.08] Quality-Aware Streaming and Scheduling for Device-to-Device Video Delivery, *IEEE/ACM Transactions on Networking*, 24(4):2319–2331, August 2016. (w/ G. Caire, A.F. Molisch), (*Selected as one of Best Reading Papers in Device-to-Device Communications by IEEE Communications Society*), (*Citations: 80+*)
- [TII'15.12] Energy-Efficient Dynamic Packet Downloading for Medical IoT Platforms, *IEEE Transactions on Industrial Informatics*, 11(6):1653–1659, December 2015.
- [TSMC'15.11] Stochastic Decision Making for Adaptive Crowdsourcing in Medical Big-Data Platforms, *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, 45(11):1471–1476, November 2015. (w/ W. Lee)
- [JCN'14.10] Fast Millimeter-Wave Beam Training with Receive Beamforming, *Journal of Communications and Networks*, 16(5):512–522, October 2014. (w/ A.F. Molisch)
- [CL'14.09] Joint Coding and Stochastic Data Transmission for Uplink Cloud Radio Access Networks, *IEEE Communications Letters*, 18(9):1619–1622, September 2014. (w/ S.-N. Hong)
- [CL'14.07] A Low-Complexity Algorithm for Neighbor Discovery in Wireless Networks, *IEEE Communications Letters*, 18(7):1119–1122, July 2014. (w/ S.-N. Hong)
- [CL'14.03] Fast and Low-Power Link Setup for IEEE 802.15.3c Multi-Gigabit/s Wireless Sensor Networks, *IEEE Communications Letters*, 18(3):455–458, March 2014. (w/ A. Mohaisen, J.-K. Kim)
- [TBC'13.09] Joint Scalable Coding and Routing for 60 GHz Real-Time Live HD Video Streaming Applications, *IEEE Transactions on Broadcasting*, 59(3):500–512, September 2013. (w/ Y. Tian, S. Mangold, A.F. Molisch)
- [TCE'07.11] Movement-Aware Vertical Handoff of WLAN and Mobile WiMAX for Seamless Ubiquitous Access, *IEEE Transactions on Consumer Electronics*, 53(4):1268–1275, November 2007. (w/ W. Lee, E. Kim, I. Lee, C. Lee), (*Citations: 100+*)
- [TCE'07.05] Coverage-Time Optimized Dynamic Clustering of Networked Sensors for Pervasive Home Networking, *IEEE Transactions on Consumer Electronics*, 53(2):433–441, May 2007. (w/ W. Lee, E. Kim, D.-W. Kim, H. Kim)
- [CL'07.01] Optimized Transmission Power Control of Interrogators for Collision Arbitration in UHF RFID Systems, *IEEE Communications Letters*, 11(1):22–24, January 2007. (w/ W. Lee, E. Kim, D. Kim, K. Suh)

## Conference and R&D Event Contributions (Selected)

### ■ Top-Tier Conference Contributions (Full Papers)

- [ICDCS'20] Understanding the Potential Risks of Sharing Elevation Information on Fitness Applications (w/ Ü. Meteriz, N.F. Yildiran, D. Mohaisen), (**Accept Rate: 17.98% (105/584)**)
- [IJCAI'19] Randomized Adversarial Imitation Learning for Autonomous Driving (w/ M. Shin), (**Accept Rate: 17.89% (850/4752)**)
- [ICDCS'18] ShmCaffe: A Distributed Deep Learning Platform with Shared Memory Buffer for HPC Architecture (w/ S. Ahn, E. Lim, W. Choi, A. Mohaisen, S. Kang), (**Accept Rate: 20.63% (78/378)**)
- [MM'17] REQUEST: Seamless Dynamic Adaptive Streaming over HTTP for Multi-Homed Smartphone under Resource Constraints (w/ J. Koo, J. Yi, M.A. Hoque, S. Choi), (**Accept Rate: 27.63% (189/684)**)
- [MobiSys'10] Energy-Efficient Rate-Adaptive GPS-based Positioning for Smartphones (w/ J. Paek, R. Govindan), (**Accept Rate: 19.84% (25/126)**), (*Citations: 500+*)

### ■ IEEE/ACM Conference Contributions

- [ICOIN'21] Infrastructure-Assisted Cooperative Multi-UAV Deep Reinforcement Energy Trading Learning for Big-Data Processing (w/ S. Jung, W.J. Yun, J.-H. Kim), (*Best Paper Award*)
- [ICOIN'21] Quantum Convolutional Neural Network for Resource-Efficient Image Classification: A Quantum Random Access Memory (QRAM) Approach (w/ S. Oh, J. Choi, J.-K. Kim)
- [ICOIN'21] A Tutorial on Quantum Graph Recurrent Neural Network (QGRNN) (w/ J. Choi, S. Oh)

- [ICOIN'21] Proper Cost Hamiltonian Design for Combinatorial Optimization Problems: A Boolean Function Approach (w/ J. Choi, S. Oh, S. Park, J.-K. Kim)
- [ICOIN'21] Non-Local Self-Attention Mechanism for Real-Time Context Embedding Deep Shadow Removal Network (w/ D. Kim)
- [ICOIN'21] Performance Comparison of SRCNN, VDSR, and SRDenseNet Deep Learning Models in Embedded Autonomous Driving Platforms (w/ M. Shin, D. Kim, S. Park, Y. Kang, J. Kim, H. Lee, W.J. Yun, J. Choi, S. Park, S. Oh, J. Yoo)
- [ICOIN'21] On the Tradeoff Between Computation-Time and Learning-Accuracy in GAN-Based Super-Resolution Deep Learning (w/ J.Y. Shim, J.-K. Kim)
- [ICOIN'21] Auction-based Truthful Distributed Resource Allocation for Smart Grid Systems (w/ H. Ahn, J. Kim)
- [ICOIN'21] Auction-Based Deep Learning Computation Offloading for Truthful Edge Computing: A Myerson Auction Approach (w/ H. Lee, S. Park, J. Kim)
- [ICOIN'21] Access Management using Vickrey-Clarke-Groves Auction in Terrestrial-Drone Networks (w/ J. Kim)
- [ICOIN'21] Joint Behavioral Cloning and Reinforcement Learning Method for Propofol and Remifentanyl Infusion in Anesthesia (w/ M. Shin)
- [ICOIN'21] Performance Evaluation of Consensus Protocols in Blockchain-based Audit Systems (w/ A. Ahmad, M. Saad, D. Nyang, D. Mohaisen)
- [ICOIN'21] Efficient Data Delivery in Content-Centric Network with Stronger Privacy of Publisher (w/ T.-Y. You, S.C. Seo)
- [ICOIN'21] Bitcoin Price Forecasting via Ensemble-based LSTM Deep Learning Networks (w/ M. Shin, D. Mohaisen)
- [ICOIN'21] Generative Adversarial Attacks on Fingerprint Recognition Systems (w/ H.W. Kwon, J. Nam, Y.K. Lee)
- [ICPR'20] S2I-Bird: Sound-to-Image Generation of Bird Species using Generative Adversarial Networks (w/ J.Y. Shim, J.-K. Kim)
- [QTML'20] A Quantum Approach to the Minimum Dominating Set Problem (w/ J. Choi, S. Oh, S. Park), *Poster*
- [ICTC'20] On the Performance of Generative Adversarial Network (GAN) Variants: A Clinical Data Study (w/ J. Yoo, J. Park, A. Wang, D. Mohaisen)
- [ICTC'20] 3D Modeling and WebVR Implementation using Azure Kinect, Open3D, and Three.js (w/ W.J. Yun)
- [ICTC'20] A Tutorial on Quantum Convolutional Neural Networks (QCNN) (w/ S. Oh, J. Choi)
- [ICTC'20] Video Placements and Dynamic Streaming Services in Wireless Caching Networks (w/ M. Choi)
- [ICTC'20] Economic Theoretic LEO Satellite Coverage Control: An Auction-based Framework (w/ J. Kim, T.D. Ngo, P.S. Oh, S. Kwon, C. Han)
- [ICTC'20] Reinforced Edge Selection using Deep Learning for Robust Surveillance in Unmanned Aerial Vehicles (w/ S. Park, J. Park, D. Mohaisen)
- [ICTC'20] Kirchhoff's Circuit Law Applications to Graph Simplification in Search Problems (w/ J. Choi)
- [ICTC'20] On the Performance of Deep Learning Models: A Case Study with COVID-19 Data (w/ S. Park, S. Park, J.C. Lee), *Recent Results*
- [ICTC'20] A Survey on Drone Simulation Software Technologies (w/ Y. Kang), *Recent Results*
- [ICML'20] XOR Mixup: Privacy-Preserving Data Augmentation for One-Shot Federated Learning (w/ M. Shin, C. Hwang, J. Park, M. Bennis, S.-L. Kim), *Workshop on Federated Learning for User Privacy and Data Confidentiality*
- [ICC'20] User Scheduling and Power Allocation for Content Delivery in Caching Helper Networks (w/ M. Choi, A.F. Molisch)
- [WCNC'20] Cache Allocations for Consecutive Requests of Categorized Contents: Service Provider's Perspective (w/ M. Choi, A.F. Molisch, D.-J. Han, J. Moon)
- [ICAII'20] Power Demand Forecasting Using Long Short-Term Memory Neural Network for Smart Grid (w/ V.H. Nguyen, V. Bui, Y.M. Jang)
- [ICAII'20] RNN-based Deep Learning for One-Hour Ahead Load Forecasting (w/ V. Bui, V.H. Nguyen, D. Kim, Y.M. Jang)
- [ICOIN'20] Learning-Based Dot-Grid Alignment for Projection Distortion Correction (w/ D. Kim, D. Kwon, S. Park)
- [ICOIN'20] The Useful Quantum Computing Techniques for Artificial Intelligence Engineers (w/ J. Choi, S. Oh)
- [ICOIN'20] Privacy-Sensitive Parallel Split Learning (w/ J. Jeon)
- [ICOIN'20] Fast and Reliable Offloading via Deep Reinforcement Learning for Mobile Edge Video Computing (w/ S. Park, Y. Kang, Y. Tian)
- [GLOBECOM'19] Multi-Agent Deep Reinforcement Learning for Cooperative Connected Vehicles (w/ D. Kwon)
- [ICCV'19] Deep Multi-modal Unsupervised Pen Pressure Stylization (w/ D. Kim), *Demo*
- [QTML'19] A Quantum Approach to Max-Weight Independent Set Problem (w/ J. Choi), *Poster*
- [ICTC'19] A Tutorial on Quantum Approximate Optimization Algorithm (QAOA): Fundamentals and Applications (w/ J. Choi)
- [ICTC'19] Overview of Distributed Federated Learning: Research Issues, Challenges, and Biomedical Applications (w/ J. Jeon, J. Huh, H. Kim, S. Cho)
- [DSN'19] Privacy-Preserving Deep Learning Computation for Geo-Distributed Medical Big-Data Platforms (w/ J. Jeon, J. Kim, K. Kim, A. Mohaisen, J.-K. Kim), *Poster*
- [MobiSys'19] Demo: Light-Weight Programming Language for Blockchain (w/ J. Kim), *Demo*
- [MobiSys'19] Poster: Multi-Agent Deep Reinforcement Learning for Connected Vehicles (w/ D. Kwon, S. Park), *Poster*
- [ICML'19] Adversarial Imitation Learning via Random Search in Lane Change Decision-Making (w/ M. Shin), *Workshop on Artificial Intelligence for Autonomous Driving (AIAD)*
- [5GWF'19] PriMO-5G: Making Firefighting Smarter with Immersive Videos through 5G (w/ K.W. Sung, E. Mutafungwa, R. Jantti, M. Choi, J. Jeon, D. Kim, J. Cost-Requena, A. Nordlow, S. Sharma, G. Destino, Y. Deng, T. Mahmoodi, M. Ullmann, A. Nahler, Y. Kyung, S. Kim, S. Seo, S.-L. Kim)
- [APWCS'19] Joint Offloading and Streaming in Mobile Edges: A Deep Reinforcement Learning Approach (w/ S. Park, J. Kim, D. Kwon, M. Shin), *(IEEE Vehicular Technology Society (VTS) Seoul Chapter Award)*
- [IJCNN'19] Depth-Controllable Very Deep Super-Resolution Network (w/ D. Kim, J. Kwon, T.-H. Kim)
- [IJCNN'19] Adversarial Imitation Learning via Random Search (w/ M. Shin)
- [ICC'19] Probabilistic Caching Policy for Categorized Contents and Consecutive User Demands (w/ M. Choi, D. Kim, D.-J. Han, J. Moon)
- [ICBC'19] Mempool Optimization for Defending Against DDoS Attacks in PoW-based Blockchain Systems (w/ M. Saad, L. Njilla, C.A. Kamhoua, D. Nyang, A. Mohaisen), **(Accept Rate: 19.61% (30/153))**
- [ICAII'19] Cyclic Parameter Sharing for Privacy-Preserving Distributed Deep Learning Platforms (w/ J. Jeon, D. Kim)
- [ICAII'19] Hardness on Style Transfer Deep Learning for Rococo Painting Masterpieces (w/ K.S. Kim, D. Kim)
- [ICOIN'19] Optimal Trajectory Learning for UAV-BS Video Provisioning System: A Deep Reinforcement Learning Approach (w/ D. Kwon)
- [CCS'18] Secure Compute-VM: Secure Big Data Processing with SGX and Compute Accelerators (w/ S. Yoo, H. Kim), *Workshop on System Software for Trusted Execution (SysTEX)*
- [SECON'18] Recipient-Oriented Transaction for Preventing Double Spending Attacks in Private Blockchain (w/ H. Lee, M. Shin, K.S. Kim, Y. Kang), *Poster*
- [ICTC'18] Opportunistic Medium Access for Hyper-Dense Beamformed IEEE 802.11ax Wireless Networks (w/ D. Kwon)

- [ICTC'18] Very Short-Term Photovoltaic Power Generation Forecasting with Convolutional Neural Networks (w/ D. Kim, S.-W. Hwang)
- [SMC'18] Low-Complexity Online Model Selection with Lyapunov Control for Reward Maximization in Stabilized Real-Time Deep Learning Platforms (w/ D. Kim, J. Kwon)
- [ICUFN'18] Detecting Selfish Backoff Attack in IEEE 802.15.4 CSMA/CA using Logistic Classification (w/ K.S. Kim)
- [AsiaCCS'18] POSTER: Mining with Proof-of-Probability in Blockchain (w/ S. Kim), *Poster*
- [ICSE'18] Poster: A Novel Shared Memory Framework for Distributed Deep Learning in High-Performance Computing Architecture (w/ S. Ahn, S. Kang), *Companion Volume*
- [MobiSys'18] Neural Network Syntax Analyzer for Embedded Standardized Deep Learning (w/ M. Shin, A. Mohaisen, J. Park, K.H. Lee), *Workshop on Embedded and Mobile Deep Learning (EMDL)*
- [ICASSP'18] Self-Adaptive Machine Learning Operating Systems for Security Applications (w/ K.S. Kim, D. Kwon, Y. Kim, J. Kim)
- [ICOIN'18] Top-Down Parsing for Neural Network Exchange Format (NNEF) in TensorFlow-based Deep Learning Computation (w/ B. Seo, M. Shin, Y.J. Mo)
- [ICOIN'18] Distributed Dynamic Power-Aware Buffering for Multi-Gbps Video Streaming in IEEE 802.11ad Fast Session Transfer (w/ D. Kwon)
- [ICOIN'18] Proactive Detection of Algorithmically Generated Malicious Domains (w/ J. Spaulding, J. Park, A. Mohaisen)
- [ICOIN'18] High-Dimensional Statistical Supervised Learning for Extracting Information in Steganography (w/ S. Hwang, K.S. Kim, Y. Kim, J. Kim, M. Park, S. Park)
- [SOSP'17] A Reliable, Self-Adaptive Face Identification Framework via Lyapunov Optimization (w/ D. Kim, J.Y. Bang), *Workshop on Artificial Intelligence Systems (AISys)*
- [PAC'17] Dynamic Security-Level Maximization for Stabilized Parallel Deep Learning Architectures in Surveillance Applications (w/ Y.J. Mo, W. Lee, D. Nyang), *Poster*
- [ICISCT'17] Hybrid Authentication Scheme in Peer-Aware Communication (w/ Y. Kim, S. Cho)
- [ICUFN'17] Performance of Deep Learning Computation with TensorFlow Software Library in GPU-Capable Multi-Core Computing Platforms (w/ Y.J. Mo, J.-K. Kim, A. Mohaisen, W. Lee)
- [ICIC'17] Queue-Aware Learning for Scheduling in Healthcare Clouds (w/ S. Cho)
- [ICIC'17] Dynamic Decision-Making for Fine-Grained Energy-Efficient Control in Millimeter-Wave Access Platforms (w/ B. Seo, Y. Lee, S. Cho)
- [SIGCOMM'16] A Longitudinal Analysis of .i2p Leakage in the Public DNS Infrastructure (w/ S.H. Jeong, A.R. Kang, H.K. Kim, A. Mohaisen), *Poster*
- [INFOCOM'16] Buffer-Stable Adaptive Per-Module Power Allocation for Energy-Efficient Millimeter-Wave Modular Antenna Array (MAA) Platforms, *Poster*
- [EuCAP'16] Millimeter-Wave Outdoor Access Shadowing Mitigation using Beamforming Arrays (w/ R. Weiler, W. Keusgen, A. Maltsev, T. Kuhne, A. Pudneyev, L. Xian, M. Peter)
- [GLOBECOM'15] 60 GHz Frequency Sharing Study between Fixed Service Systems and Small-Cell Systems with Modular Antenna Arrays (w/ L. Xian, R. Arefi, A.S. Sadri), *Workshop on Millimeter-Wave Backhaul and Access: From Propagation to Prototyping*
- [ICTC'15] Feasibility Study of Stochastic Streaming with 4K UHD Video Traces (w/ E.-S. Ryu)
- [ICTC'15] Towards Robust UHD Video Streaming Systems using Scalable High Efficiency Video Coding (w/ E.-S. Ryu, Y. Ryu, H.-J. Roh, B.-G. Lee)
- [SOSP'15] A Case for Bad big.LITTLE Switching: How to Scale Power-Performance in SI-HMP (w/ S. Yoo, Y. Shim, S. Lee, S.-A. Lee), *Workshop on Power-Aware Computing Systems (HotPower)*
- [IMS'15] Study of Coexistence between 5G Small-Cell Systems and Systems of the Fixed Service at 39 GHz Band (w/ L. Xian, A. Maltsev, R. Arefi, A.S. Sadri)
- [GLOBECOM'14] Required Frequency Rejection in 39 GHz Millimeter-Wave Small Cell Systems (w/ L. Xian, A. Maltsev, R. Arefi, A.S. Sadri), *Industry Program*
- [ICC'14] Quality-Aware Millimeter-Wave Device-to-Device Multi-Hop Routing for 5G Cellular Networks (w/ A.F. Molisch)
- [ITA'14] Joint Scheduling and Stochastic Streaming for Device-to-Device Video Delivery (w/ A. Turci, G. Caire, A.F. Molisch), *Graduation Day Talk*
- [MobiCom'13] Demo: Adaptive Video Streaming for Device-to-Device Mobile Platforms (w/ F. Meng, P. Chen, H.E. Egilmez, D. Bethanabhotla, A.F. Molisch, M.J. Neely, G. Caire, A. Ortega), *Demo*
- [ICC'13] Quality-Aware Coding and Relaying for 60 GHz Real-Time Wireless Video Broadcasting (w/ Y. Tian, S. Mangold, A.F. Molisch)
- [RWS'13] Enabling Gigabit Services for IEEE 802.11ad-Capable High-Speed Train Networks (w/ A.F. Molisch)
- [PIMRC'11] Joint Optimization of HD Video Coding Rates and Unicast Flow Control for IEEE 802.11ad Relaying (w/ Y. Tian, A.F. Molisch, S. Mangold)
- [CCNC'10] mmWave SVD-based Beamformed MIMO Communication Systems (w/ S. Tiraspolsky, B. Jeon, A. Rubtsov, A. Flaksman, V. Ermolayev)
- [CCNC'09] Demonstration of Display Sharing over Multi-Gbps Wireless Video and Audio Network (w/ B. Jeon)
- [CCNC'09] Optimal Beaconing for 60 GHz Millimeter Wave (w/ B. Jeon)
- [COMSWARE'08] Cooperative Relaying Strategies for Multi-Hop Wireless Sensor Networks (w/ W. Lee)
- [CIT'06] A Power Balanced Multipath Routing Protocol in Wireless Ad-Hoc Sensor Networks (w/ D. Kim, W. Lee, B.-N. Park, C. Shin, C. Shin)
- [VTC'06-Spring] Energy-Aware Distributed Topology Control for Coverage-Time Optimization in Clustering-Based Heterogeneous Sensor Networks (w/ J. Choi, W. Lee)
- [ICCCN'05] Effect of Localized Optimal Clustering for Reader Anti-Collision in RFID Networks (w/ W. Lee, J. Yu, J. Myung, E. Kim, C. Lee)
- [VTC'05-Spring] Low-Energy Localized Clustering: An Adaptive Cluster Radius Configuration Scheme for Topology Control in Wireless Sensor Networks (w/ S. Kim, D. Kim, W. Lee, E. Kim)

## Patents (Granted)

- **21 US Patents:** (US 10637154), (US 9973364), (US 9887755), (US 9786985), (US 9167562), (US 8842640), (US 8761063), (US 8738068), (US 8619741), (US 8605634), (US 8599731), (US 8565200), (US 8547889), (US 8503317), (US 8493949), (US 8493948), (US 8483171), (US 8422372), (US 8416782), (US 8411644), (US 8379612)
- **9 Korean Patents:** (KR 102167344), (KR 102052835), (KR 102015429), (KR 101663613), (KR 101619964), (KR 101606951), (KR 101567829), (KR 101558017), (KR 100779165)



- **5 European Patents:** (EP 2422578), (EP 2343836), (EP 2282601), (EP 2262342), (EP 2260669)
- **9 Chinese Patents:** (CN 107634349), (CN 102461318), (CN 102461050), (CN 102388658), (CN 102318430), (CN 102318425), (CN 102204115), (CN 102132602), (CN 102057739)
- **6 Japanese Patents:** (JP 5584209), (JP 5584205), (JP 5580308), (JP 5508403), (JP 5368573), (JP 5364785)

## Teaching Experience and Research Supervision

### Teaching Experience

#### Korea University – College of Engineering, *Faculty Member*

- **School of Electrical Engineering – Graduate Courses:** *Wireless and Mobile Networks* (ECE522 – Spring 2020); *Smart Mobile Platform* (ECE654 – Fall 2020, Fall 2019); *IT R&D Policies 1* (ECE723 – Fall 2020)
- **School of Electrical Engineering – Undergraduate Courses:** *Computer Language and Laboratory* (EGRN151 – Fall 2020, Fall 2019 (**Granite Tower (Seok-Top) Best Teaching Award**)); *Digital System* (KECE207 – Spring 2020); *Probability and Random Process* (KECE209 – Spring 2020); *Digital System Design and Laboratory* (KECE210 – Fall 2020); *Data Communications* (KECE316 – Fall 2020)

#### Chung-Ang University – College of Computer Science and Software, *Faculty Member*

- **School of Computer Science and Engineering – Graduate Courses:** *Optimal Design Theory and Applications* (Spring 2019, Spring 2018, Spring 2017); *Topics in Computer Science and Engineering* (Fall 2018, Fall 2017, Fall 2016)
- **School of Computer Science and Engineering – Undergraduate Courses:** *Numerical Analysis* (Spring 2019); *Compiler Design* (Spring 2019, Spring 2018, Spring 2017); *Principles of Programming Languages* (Fall 2018, Fall 2017, Fall 2016); *Algorithm Analysis* (Fall 2016); *Operating Systems* (Spring 2017, Spring 2016); *Calculus* (Spring 2017, Spring 2016); *Mobile Application Development* (Fall 2018, Fall 2017)

#### University of Southern California – Viterbi School of Engineering, *Teaching Assistant*

- *Wireless and Mobile Networks Design and Lab* [EE579] (Spring 2013), Lectured by **Professor Murali Annavaram**  
Graduate Course dedicated to Android Mobile Platform Research and Programming
- *Programming Systems Design* [CSci455x] (Spring 2012, Fall 2012), Lectured by **Professor Claire Bono**  
Undergraduate Course dedicated to Object-Oriented Programming (Java and C++) and Advanced Data Structures

### Research Collaboration and Supervision

#### Postdoctoral Scholars

- **Dr. Minseok Choi** (09/2018–02/2019), jointly with **University of Southern California** (co-advised by Prof. Andreas F. Molisch)  
Currently, *Assistant Professor* at **Jeju National University**, Jeju, Korea
- **Dr. Soyi Jung** (03/2021–), jointly with **University of California at Irvine** (co-advised by Prof. Marco Levorato)  
Currently, *Research Professor* at **Korea University**, Seoul, Korea

#### Ph.D. Course Students and Alumni

- **Soohyun Park** (03/2019–02/2023)
- **Haemin Lee** (09/2020–02/2024)
- **Hankyul Paik** (03/2021–02/2025)
- **Won Joon Yun** (03/2021–02/2025)
- **Hyunsoo Lee** (03/2021–02/2025)
- **Yoo Jeong (Anna) Ha** (03/2021–02/2025)
- **GuSang Lee** (03/2022–02/2026)

#### M.S. Course Students and Alumni

- **Kyeongseon Kim** (09/2017–08/2019), *Researcher* at **LG Electronics**, Seoul, Korea
- **Dohyun Kwon** (03/2018–02/2020), *Researcher* at **Hyundai-Autoever**, Seoul, Korea
- **Dohyun Kim** (03/2018–02/2020), *Researcher* at **Naver Corporation**, Seongnam, Korea
- **MyungJae Shin** (03/2018–02/2020), *Researcher* at **Seoul National University Hospital**, Seoul, Korea
- **Jaeho Choi** (03/2019–02/2021)
- **Seunghoon Park** (03/2020–02/2022)
- **Youngki Kim** (03/2021–02/2023, On-Leave from KETI), *Researcher* at **Korea Electronics Technology Institute**, Seongnam, Korea
- **Minjae Yoo** (03/2021–02/2023)

#### Intel Corporation (Santa Clara, California, USA), *Graduate Interns*

- **Minseok Choi**, Ph.D. in EE from KAIST (02/2016–07/2016), now with **Jeju National University**, Jeju, Korea
- **Hidekazu Shimodaira**, Ph.D. in EEE from Tokyo Institute of Technology (07/2015–12/2015), now with **NTT DOCOMO**, Tokyo, Japan

#### USC Viterbi School of Engineering (Los Angeles, California, USA), *Graduate Students*

- **Feiyu Meng**, M.S. in EE from USC (Summer 2013, Fall 2013), now with **Apple**, Silicon Valley, CA, USA
- **Vivek Sankaravadivel**, M.S. in EE from USC (Spring 2011, Fall 2011), now with **Uber**, Silicon Valley, CA, USA

## Professional Activities

### Academic Activities in IEEE

#### Editorial Boards

- **Associate Editor (2020–),** *IEEE Transactions on Vehicular Technology*
- **Guest Editor,** *Elsevier ICT Express – Special Issue on Mobile and Edge Computing Systems* 06/2021
- **Guest Editor,** *MDPI Electronics – Special Issue on Energy-Aware and Efficient Computing and Communications* 05/2021
- **Guest Editor,** *MDPI Electronics – Special Issue on Special Issue on Millimeter Wave Technology in 5G* 01/2020



## Talks and Presentations (Selected)

### Tutorials and Special Session Talks in International Conferences

- *Trust Computing with Learning-based Auction for Distributed Systems*  
**International Workshop on Smart Info-Media Systems in Asia (SISA 2020) Keynote Speech** (Seoul, Korea, 12/2020)
  - *Advanced Deep Learning Methods and Their Applications to Distributed and Network Platforms*  
**IEEE International Conference on ICT Convergence (ICTC 2019) Special Session Talk** (Jeju, Korea, 10/2019)
  - *Distributed Platform Research for Emerging Deep Learning Applications*  
**IEEE International Conference on Information Networking (ICOIN 2019) Tutorial** (Kuala Lumpur, Malaysia, 01/2019)
  - *Securing the Internet of Things: A Machine Learning Approach (Making Machine Learning Practical)*  
**IEEE International Conference on Communications (ICC 2018) Tutorial** (Kansas City, MO, USA, 05/2018)
- Joint Presentation with Prof. Aziz Mohaisen (University of Central Florida, Orlando, FL, USA)

### Invited Talks at World-Wide Universities and Research Institutes

- *XOR Mixup: Privacy-Preserving Data Augmentation for One-Shot Federated Learning*  
**Huawei Research Center (Deep Learning/Machine Learning for Computer Vision)** (Nizhny Novgorod, Russia, 09/2020)
- *Deep Reinforcement Learning Research and Its Applications to Networks*  
**Huawei Research Center (Fundamental and Applied Problems of Machine Learning)** (Nizhny Novgorod, Russia, 12/2019)
- *Enabling Delay-Sensitive Robust Distributed Blockchain Mining via Econometric Methods*  
**City University of Hong Kong** (Hong Kong, 11/2018), Hosted by Prof. Cong Wang
- *Frequency Sharing Study between 5G Micro-Cellular Systems and Fixed Service Systems in Millimeter-Wave Bands*  
**Intel Communications and Devices Group (iCDG) [Cellular Modem TechTalk]** (Santa Clara, CA, USA, 01/2016)
- *Status of Millimeter-Wave and Device-to-Device Research*  
**Nokia Research Center at Berkeley** (Berkeley, CA, USA, 08/2014)
- *Advanced Device-to-Device Video Streaming: Theory and Implementation*  
**Qualcomm Research Center** (San Diego, CA, USA, 02/2014)

### Tutorials and Special Session Talks at Korean Research Societies

- *Trends in Multi-Agent Deep Reinforcement Learning for Distributed Computing*; **2020 KICS Fall Conference Tutorial** (Seoul, Korea, 11/2020)
- *Deep Learning Computation for Economic Theory and Its Applications*; **2020 KICS Summer Conference Tutorial** (Yong Pyong, Korea, 08/2020)
- *Deep Learning Applications to Computer Networking*; **2020 KICS Winter Conference Tutorial** (Yong Pyong, Korea, 02/2020)
- *Deep Neural Network Basics*; **2020 KICS Winter Conference Tutorial** (Yong Pyong, Korea, 02/2020)
- *Artificial Intelligence Methods for Networks*; **2019 KICS Fall Conference Special Session Talk** (Seoul, Korea, 11/2019)
- *Explainable AI (XAI) and Imitation Learning for Automotive Applications*; **2019 IEK Hyundai Motors Special Session** (Jeju, Korea, 06/2019)
- *Deep Learning Basics and Representative Models*; **2019 KIPS Spring Conference Tutorial** (Seoul, Korea, 05/2019)
- *Deep Learning Methods for Advanced Network*; **2019 KICS Winter Conference Tutorial** (Yong Pyong, Korea, 01/2019)
- *GPU Computing Platforms and Software for Deep Learning*; **2017 KICS Summer Conference Tutorial** (Jeju, Korea, 06/2017)
- *Dynamic Control and Software for Next-Generation Distributed Platforms*; **2017 KCC Special Session on New Research** (Jeju, Korea, 06/2017)
- *Machine Learning Techniques for Mobile Computing*; **2017 KICS Winter Conference Tutorial** (Jungsun, Korea, 01/2017)

### Invited Talks at Korean Research Institutes

- *Network Performance Enhancement via Deep Reinforcement Learning*; **LG U+** (Seoul, Korea, 10/2019)
- *AI Seminar: Foundations and Business Cases*; **SK Broadband** (Seoul, Korea, 10/2019)
- *Deep Learning Methods for Advanced Networks*; **Korea Electronics Technology Institute (KETI)** (Pankyo, Korea, 02/2019)
- *Making Deep Neural Network Practical in Resource Constrained Computing Systems*; **ETRI** (Daejeon, Korea, 02/2018)
- *Dynamic Optimization for Reliable and Robust Deep Learning Systems*; **ETRI** (Daejeon, Korea, 02/2018)
- *Adaptive Lyapunov Control for Stabilized Learning Platforms*; **ETRI** (Daejeon, Korea, 07/2017)
- *GPU Computing Platforms and Software for Deep Learning*; **ETRI** (Daejeon, Korea, 07/2017)
- *Trends in Energy IT in Big-Data Era*; **Korea Electric Power Corporation (KEPCO) Research Institute** (Daejeon, Korea, 05/2017)
- *Stochastic Control of 60 GHz Links for Distributed Virtual Reality Network Platforms*; **ETRI** (Daejeon, Korea, 11/2016)
- *5G Wireless Platforms: Standards and Hardware/Software Prototyping*; **ETRI** (Daejeon, Korea, 10/2016)
- *Millimeter-Wave Radio Propagation, Beam Management, Systems, and Embedded Prototyping*; **ETRI** (Daejeon, Korea, 08/2016)
- *Intel's 5G Research with Millimeter-Wave Modular Antenna Arrays*; **ETRI** (Daejeon, Korea, 10/2014)
- *Issues and Solutions for Millimeter-Wave Network Technologies*; **Samsung Electronics - Memory Business** (Hwasung, Korea, 01/2013)

### Invited Talks at Korean Universities (Selected)

- *Research Trends in Distributed Bigdata Platforms*; **Seoul National University Hospital** (Seoul, Korea, 04/2019)
- *Deep Reinforcement Learning Methods for Vehicular Networks*; **UNIST** (Ulsan, Korea, 03/2019)
- *Deep Reinforcement Learning: Algorithms and Applications*; **Korea University** (Seoul, Korea, 02/2019)
- *Distributed Deep Learning Platform for Medical Big-Data*; **Seoul National University Hospital** (Seoul, Korea, 10/2018)
- *Wireless Video Streaming via Lyapunov Optimization*; **KAIST** (Daejeon, Korea, 05/2018)
- *Blockchain Technologies and Applications*; **Korea University** (Seoul, Korea, 03/2018)
- *Reinforcement Learning Theory and Implementation*; **Korea University** (Seoul, Korea, 02/2018)
- *Deep Learning Theory and Implementation*; **Korea University** (Seoul, Korea, 02/2018)
- *Systems Research for Data-Intensive Learning Computation*; **Korea University** (Seoul, Korea, 10/2017)
- *Trends in 5G Millimeter-Wave Wireless Networking Research*; **POSTECH** (Pohang, Korea, 05/2017)
- *Markov Decision Process*; **Korea University** (Seoul, Korea, 01/2017)
- *Frequency Sharing Study between 5G Small-Cell Systems and Fixed Service Systems in Millimeter-Wave Bands*; **DGIST** (Daegu, Korea, 07/2016)
- *Stochastic Scheduling and Streaming for Device-to-Device Video Delivery*; **Seoul National University** (Seoul, Korea, 06/2016)
- *Intel's 5G Research with Millimeter-Wave Modular Antenna Arrays*; **Korea University** (Seoul, Korea, 11/2014)
- *Elements of Next-Generation Wireless Video Systems: Millimeter-Wave and D2D Algorithms*; **Korea University** (Seoul, Korea, 10/2014)
- *Issues and Solutions for Millimeter-Wave Network Technologies*; **Korea University** (Seoul, Korea, 01/2013)

### Special Lectures (Full/Half Day Presentation) at Research Institutes and Societies

- *Deep Reinforcement Learning: Algorithms, Software, Applications, and Trends*, **OSIA** (Seoul, Korea, 11/2019)
- *Deep Reinforcement Learning*; **KICS Workshop** (Daejeon, Korea, 10/2019)
- *Deep Learning Theory and Software*; **Korea Institute for Robot Industry Advancement** (Daegu, Korea, 08/2019)
- *Deep Learning Basics and Software*; **KICS Workshop** (Seoul, Korea, 08/2019)
- *Deep Learning Theory and Software*; **IEIE Special Lecture Series** (Seoul, Korea, 08/2019)
- *Machine Learning (Advanced)*; **Korea Institute of Robot and Convergence** (Seoul, Korea, 07/2019)
- *Deep Reinforcement Learning: from Basics to Autonomous Driving Applications*; **KICS Workshop** (Seoul, Korea, 07/2019)
- *Deep Learning Programming with TensorFlow/Keras*; **Korea Institute for Robot Industry Advancement** (Daegu, Korea, 07/2019)
- *Deep Reinforcement Learning*; **KIIE Information Networking Society** (Seoul, Korea, 05/2019)
- *Machine Learning for Data Analytics*; **Intelligent Transport Society of Korea (ITS Korea)** (Anyang, Korea, 04/2019)
- *Deep Learning Programming with TensorFlow/Keras*; **Korea Institute for Robot Industry Advancement** (Daegu, Korea, 02/2019)
- *Deep Learning Programming with TensorFlow*; **Korea Institute for Robot Industry Advancement** (Gumi, Korea, 09/2018)
- *Deep Reinforcement Learning: Algorithms and Applications*, **OSIA** (Seoul, Korea, 02/2019)
- *Deep Learning Theory and TensorFlow Implementation*, **Korean Institute of Broadcast and Media Engineers** (Seoul, Korea, 02/2019)
- *Deep Learning Programming with TensorFlow*, **Korea Institute for Robot Industry Advancement** (Gumi, Korea, 09/2018)
- *The 1st KICS Lecture on TensorFlow-based Deep Learning Programming*, **KICS Workshop** (Seoul, Korea, 06/2018)
- *Machine Learning Basics*, **KIIE Database Society - Big Data Technology Winter School** (Seoul, Korea, 02/2018)

### Special Lectures (Full/Half Day Presentation) at Industry

- *Artificial Intelligence (A.I.) Practice*, **KTDS** (2019)
- *Deep Learning Theory and Software*, **KT Education Center for Artificial Intelligence** (2017, 2018, 2019), **SK C&C** (2018, 2019), **PoscoICT** (2018), **BC Card** (2019)
- *Deep Learning and Natural Language Processing*, **PoscoICT** (2018), **LGCNS** (2018, 2019)
- *Natural Language Processing with Deep Learning Practice*, **LGCNS** (2018, 2019)
- *Natural Language Processing with Deep Learning Workshop*, **LGCNS** (2018, 2019)
- *Machine Learning Theory and Practice*, **PoscoICT** (2017), **KT Education Center for Artificial Intelligence** (2017, 2018), **LGCNS** (2018), **Shinhan Card** (2018), **SK C&C** (2019)
- *Learning Inference*, **KT Education Center for Artificial Intelligence** (2018)
- *Statistics and Statistical Inference for Big-Data Analytics*, **LGCNS** (2018)
- *Python Programming and TensorFlow*, **KTDS** (2017)

### Exhibition/Demonstration at Conferences and Public R&D Events

- *Deep Multi-modal Unsupervised Pen Pressure Stylization*; **IEEE/CVF ICCV 2019** (Seoul, Korea, 11/2019)
- *Light-Weight Programming Language for Blockchain*; **ACM MobiSys 2019** (Seoul, Korea, 06/2019)
- *Mobile Edge mmWave Backhaul and Access*; **Mobile World Congress (MWC) 2016** (Barcelona, Spain, 02/2016)
- *mmWave MAA Client Access & Backhaul Platform*; **Intel 360 degree 2016** (Anaheim, CA, 02/2016)
- *mmWave MAA Client Access & Backhaul Platform*; **IEEE GLOBECOM 2015 (Industry Demonstration ID-14)** (San Diego, CA, 12/2015)
- *mmWave Modular Antenna Array Client Access & Backhaul Platform*; **Intel Asia Innovation Summit 2015** (Taipei, Taiwan, 10/2015)
- *Enabling 5G Densification*; **Intel Developer Forum (IDF) 2015** (San Francisco, CA, USA, 08/2015)
- *Enabling 5G Densification*; **Intel Design and Test Technology Conference (DTTC) 2015** (Portland, OR, USA, 08/2015)
- *Enabling 5G Densification*; **Mobile World Congress (MWC) 2015** (Barcelona, Spain, 03/2015)
- *mmWave Modular Antenna Array for Next-Generation Wireless Networks*; **IEEE GLOBECOM 2014 (Expo)** (Austin, TX, USA, 12/2014)
- *Adaptive Video Streaming for Device-to-Device Mobile Platforms*; **ACM MobiCom 2013** (Miami, FL, USA, 10/2013)

### Conference Activities and Services

#### Conference Activities

- **OC Patronage Chair**, 2022 IEEE International Conference on Communications (ICC)
- **TPC Vice Co-Chair**, 2021 IEEE International Conference on Information Networking (ICOIN)
- **TPC**, 2021 IEEE International Conference on Communications (ICC), Wireless Communications Symposium
- **TPC**, 2021 IEEE Wireless Communications and Networking Conference (WCNC)
- **Workshop Organizing Chair**, 2021 IEEE ICOIN Workshop on Artificial Intelligence and Mobility (AIM)
- **OC Secretary**, 2020 IEEE International Conference on ICT Convergence (ICTC)
- **TPC**, 2020 IEEE International Conference on ICT Convergence (ICTC)
- **Special Session Organizing Chair**, 2020 IEEE ICTC Special Session on KU-AIER (Korea University, A.I. Engineering Research)
- **TPC**, 2020 IEEE Global Communications Conference (GLOBECOM), Ad-hoc and Sensor Networks Symposium
- **TPC**, 2020 IEEE Green Energy and Smart Systems Conference (IGESSC)
- **TPC**, 2020 IEEE Wireless Communications and Networking Conference (WCNC)
- **TPC**, 2020 IEEE WCNC Workshop on Aerial Communications in 5G and Beyond Networks (AERCOMM)
- **TPC Co-Chair**, 2020 IEEE International Conference on Artificial Intelligence in Information and Communication (ICAIIIC)
- **TPC Vice Co-Chair**, 2020 IEEE International Conference on Information Networking (ICOIN)
- **Workshop Organizing Chair**, 2020 IEEE ICOIN Workshop on Artificial Intelligence and Mobility (AIM)
- **TPC**, 2020 IEEE International Conference on Ubiquitous and Future Networks (ICUFN)
- **OC Secretary**, 2019 IEEE International Conference on ICT Convergence (ICTC)
- **TPC**, 2019 IEEE International Conference on ICT Convergence (ICTC)
- **TPC**, 2019 ACM International Symposium on Mobile Ad-Hoc Networking and Computing (MobiHoc)
- **TPC**, 2019 IEEE International Conference on Distributed Computing Systems (ICDCS)
- **TPC**, 2019 IEEE Vehicular Technology Conference (VTC Spring)
- **TPC Co-Chair**, 2019 IEEE International Conference on Networking, Architecture, and Storage (NAS)
- **TPC**, 2019 IEEE International Conference on Blockchain (Blockchain)
- **TPC**, 2019 IEEE Green Energy and Smart Systems Conference (IGESSC)
- **TPC**, 2019 IEEE International Conference on Communications in China (ICCC), Wireless Networking Track
- **TPC Co-Chair**, 2019 IEEE International Conference on Artificial Intelligence in Information and Communication (ICAIIIC)
- **OC Publication Chair**, 2019 IEEE International Conference on Artificial Intelligence in Information and Communication (ICAIIIC)

- **TPC Vice Co-Chair**, 2019 IEEE International Conference on Information Networking (ICOIN)
- **TPC**, 2019 IEEE International Conference on Ubiquitous and Future Networks (ICUFN)
- **TPC**, 2019 European Conference on Antennas and Propagation (EuCAP)
- **OC Secretary**, 2018 IEEE International Conference on ICT Convergence (ICTC)
- **TPC**, 2018 IEEE International Conference on ICT Convergence (ICTC)
- **TPC**, 2018 IEEE Green Energy and Smart Systems Conference (IGESSC)
- **TPC**, 2018 IEEE International Conference on Wireless Communications and Signal Processing (WCSP)
- **TPC**, 2018 ACM AsiaCCS Workshop on Security in Cloud Computing (SCC)
- **Special Session Organizing Chair**, 2018 IEEE ICASSP Special Session on Cybersecurity and Privacy
- **TPC Vice Co-Chair**, 2018 IEEE International Conference on Information Networking (ICOIN)
- **TPC**, 2018 IEEE VTS Asia Pacific Wireless Communications Symposium (APWCS)
- **OC Publication Vice Chair**, 2017 IEEE VTS Asia Pacific Wireless Communications Symposium (APWCS)
- **TPC**, 2018 IEEE International Conference on Ubiquitous and Future Networks (ICUFN)
- **TPC**, 2017 IEEE International Conference on ICT Convergence (ICTC)
- **Organizer**, 2015 IEEE GLOBECOM Workshop on Millimeter-Wave Backhaul and Access (mmWave)
- **TPC**, 2016 IEEE Vehicular Technology Conference (VTC Spring), Recent Results Track
- **TPC**, 2016 IEEE International Conference on Ubiquitous and Future Networks (ICUFN)
- **TPC Chair**, 2015 IEEE GLOBECOM Workshop on Millimeter-Wave Backhaul and Access (mmWave)
- **TPC**, 2015 IEEE Vehicular Technology Conference (VTC Spring), Recent Results Track
- **TPC**, 2015 European Conference on Antennas and Propagation (EuCAP)
- **TPC**, 2014 IEEE Vehicular Technology Conference (VTC Fall), Recent Results Track
- **TPC**, 2012 IEEE MASS Workshop on Internet of Things Technology and Architectures (IoTech)

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## References

- **Prof. Andreas F. Molisch** (*Fellow of the IEEE*), *Ph.D. Research and Dissertation Advisor*
  - Solomon Golomb – Andrew and Erna Viterbi Chair at the University of Southern California (Los Angeles, California, USA)
  - Professor of Electrical and Computer Engineering at the University of Southern California (Los Angeles, California, USA)
  - URL: <https://wides.usc.edu/founder.html>
- **Prof. Wonjun Lee** (*Fellow of the IEEE*), *M.S. Research and Thesis Advisor*
  - Professor of Information Security at Korea University (Seoul, Republic of Korea)
  - URL: <http://netlab.korea.ac.kr/wlee/>