# Joongheon Kim

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## **Highlights**

#### Research Milestones

- 61 IEEE Journals (published and accepted),
  The Complete Journals List (totally, 106): https://sites.google.com/view/aimlab-kuee/publications/journals
- 9 Top-Tier Conference Papers, i.e., NeurIPS (review), ACM CIKM (review), IEEE ICDCS (2022), IEEE INFOCOM (2022), IEEE ICDCS (2020), IJCAI (2019), IEEE ICDCS (2018), ACM Multimedia (2017), and ACM MobiSys (2010)
- 4685+ Citations in Google Scholar Profile (H-index: 31+, i10-index 107+)
- IEEE MMTC Best Journal Paper Award (2021), IEEE Communications Society
- IEEE MMTC Outstanding Young Researcher Award (2020), IEEE Communications Society
- IEEE Systems Journal Best Paper Award (2020), Top 7 among 793 accepted papers in 2019 (0.88%)
- 6 Awards from IEEE Conferences and Contests, i.e., IEEE ICOIN Best Paper Award (2021), IEEE Seoul Section Student Paper Contest Awards (1 in 2020; 1 in 2019), and IEEE VTS Seoul Chapter Awards (2 in 2021; 1 in 2019)
- 5 Tutorials at IEEE Conferences, i.e., ICOIN (2022), ICUFN (2021), ICAIIC (2021), ICOIN (2019), and ICC (2018)
- 62+ Patents are granted, and among them, 46 Granted Patents are successfully adopted by 60 GHz Millimeter-Wave IEEE 802.11 Standards, i.e., IEEE 802.11ad and IEEE 802.11ay
- 16 Awards from Local (Korean) Conferences and Contests
- Research Funds (since March 2016): 5,468,384 USD  $\approx$  5,468,384,000 KRW (except University Internal Funds)

## Research Supervision and Teaching (As a faculty member since March 2016)

- Supervised 3 Postdoctoral Scholars, tenure-track professors at Kyung Hee University (Korea) and Hallym University (Korea); and a postdoctoral scholar at the University of Southern California (USA, jointly advised by Prof. Andreas F. Molisch)
- Supervised 1 Ph.D. and 5 M.S. Students, researchers at LG Electronics, Hyundai, Naver, government agency, and startup
- 6 Best Teaching Awards at Korea University, 3 awards are for top 5% (*Granite Tower Best Teaching Award*) and 3 awards are for top 20% (*Best Teaching Award*)

## **IEEE Society Academic Activities**

- Senior Member of the IEEE (2018–) and IEEE Membership for 17+ years
- Distinguished Lecturer, IEEE Communications Society (ComSoc) (class of 2022–2023)

IEEE ComSoc

**IEEE Systems Council** 

- Distinguished Lecturer, IEEE Systems Council (class of 2022–2024)
- Associate Editor (2020–), IEEE Transactions on Vehicular Technology

IEEE VTS

- Guest Editor (06/2022), IEEE Communications Standards Magazine (S.I. on Recent and Future Evolution of Wi-Fi) IEEE ComSoc
- IEEE Vehicular Technology Society (VTS), Seoul Chapter Treasurer for 3 years (2020–2023)

IEEE VTS

- 21+ Organizing Committee (OC) Contributions for IEEE Conferences
- 57+ Technical Program Committee (TPC) Contributions for IEEE Conferences

## **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, Fellow of the IEEE)
  - 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
  - B.S. (03/1999–02/2004) in Computer Science and Engineering

#### **R&D Positions**

### **Full-Time Positions**

- Korea University College of Engineering, Seoul, Republic of Korea
  - Associate Professor (03/2021–Present), School of Electrical Engineering
  - Adjunct Professor (03/2023–Present), Department of Communication Engineering (with Samsung Electronics)
  - Adjunct Professor (03/2021–02/2023), Department of Semiconductor Engineering (with SK Hynix)
  - Assistant Professor (09/2019–02/2021), School of Electrical Engineering
  - R&D Positions
    - \* Vice Director (10/2020–Present), Artificial Intelligence Engineering Research Center (KU-AIER)
- 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), CA, 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, CA, USA
  - Annenberg Graduate Fellow (08/2009), Awarded with Ph.D. admission in Computer Science from USC (2009)
  - Ph.D. Research Assistant (01/2011–08/2014), Communication Sciences Institute (Advised by Prof. Andreas F. Molisch)
  - Teaching Assistant (01/2012-05/2013), Computer Science and Electrical Engineering Departments (CSCI455x and EE579)
- InterDigital, San Diego, CA, USA
  - Intern (05/2012–08/2012), Wireless Systems Evolution Department
  - Subject Matter Expert in IEEE 802.11ad (01/2012–02/2012), 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

## Industry, Advisory, and Consulting Positions

• Samsung Electronics (C-Lab), Seoul National University R&D Center, Seoul, Republic of Korea *Advisory Professor* (02/2020–08/2020), Nonlinear Regression Deep Learning Algorithm Design and Implementation

## Academia (Membership, Editorial Boards, and Services)

- IEEE
  - Senior Member (2018–), Member (2006–2017)
  - Distinguished Lecturer (2022–2023), IEEE Communications Society
  - Associate Editor (2020-), **IEEE Transactions on Vehicular Technology** (Area: Vehicular Electronics and Systems)
  - Guest Editor (03/2022), IEEE Communications Standards Magazine (S.I. on Recent and Future Evolution of Wi-Fi)
  - IEEE Vehicular Technology Society (VTS) Seoul Chapter
    - \* Chapter Treasurer (2022–Present)
    - \* Chapter Treasurer (2020–2021)
    - \* IEEE VTS Asia Pacific Wireless Communications Symposium (APWCS) Organizing Committee: Finance Chair (2022), Finance Co-Chair (2021)
- Elsevier
  - *Editor* (2021–), **ICT Express** (Area: AI for ICT Applications)
  - Guest Editor (10/2022), Computer Networks (S.I. on Machine Learning (ML) and Artificial Intelligence (AI) for the Internet
    of Things, 5G, and Beyond)
  - Guest Editor (03/2022), ICT Express (S.I. on Artificial Intelligence and Machine Learning Approaches to Communication)
  - Guest Editor (03/2021), ICT Express (S.I. on Mobile and Edge Computing Systems)

#### **Awards and Honors**

## Research and Academic Excellence (International)

- Distinguished Lecturer (class of 2022–2024) IEEE Systems Council
- Distinguished Lecturer (class of 2022–2023) IEEE Communications Society
- IEEE VTS Seoul Chapter Award (2022) IEEE Vehicular Technology Society (with H. Lee) "Deep Reinforcement Learning for Loitering Munition Mobility Control: Algorithm Design and Visualization"
- IEEE MMTC Best Journal Paper Award (2021) IEEE Communications Society (with M. Choi, A.F. Molisch)
  - M. Choi, A.F. Molisch, and J. Kim, "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.
- IEEE VTS Seoul Chapter Award (2021) IEEE Vehicular Technology Society (with Y. Kwak, S. Jung, J.-H. Kim) "Quantum Scheduling for Millimeter-Wave Observation Satellite Constellation"
- IEEE VTS Seoul Chapter Award (2021) IEEE Vehicular Technology Society (with H. Lee, S. Jung) "Distributed and Autonomous Aerial Data Collection in Smart City Surveillance Applications"
- IEEE ICOIN Best Paper Award (2021) IEEE Computer Society (with S. Jung, W.J. Yun, J.-H. Kim)
  - 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 ICOIN*, Jeju, Korea, January 2021.
- IEEE MMTC Outstanding Young Researcher Award (2020) IEEE Communications Society
- Bronze Paper Award (2020) 2020 IEEE Seoul Section Student Paper Contest (with S. Park) "Reliable Offloading Target Selection using Deep Reinforcement Learning for Large Fire Accident"
- IEEE Systems Journal Best Paper Award (2020) IEEE Systems Council (with M. Saad, J. Choi, D. Nyang, A. Mohaisen)
  - M. Saad, J. Choi, D. Nyang, J. Kim, and A. Mohaisen, "Towards Characterizing Blockchain-based Cryptocurrencies for Highly-Accurate Predictions," *IEEE Systems Journal*, 14(1):321-332, March 2020.
- Gold Paper Award (2019) 2019 IEEE Seoul Section Student Paper Contest (with J. Yoo)
- "Stabilized Super-Resolution Deep Learning Adaptation for UAV-Assisted Mobile Edges: A Lyapunov Optimization Approach"
- IEEE VTS Seoul Chapter Award (2019) IEEE Vehicular Technology Society (with S. Park, D. Kwon, M. Shin) "Joint Offloading and Streaming in Mobile Edges: A Deep Reinforcement Learning Approach"
- Next Generation and Standards (NGS) Division Recognition Award (Q1/2005) *Intel Corporation*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 (2009) – *University of Southern California* 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)

- Haedong Young Scholar Award (2018) KICS and Haedong Foundation
  - For recognizing a researcher under the age of 40 who has made outstanding contributions to communication sciences R&D
- Outstanding Paper Award (2008) LG Electronics CTO Office, Multimedia Research Laboratory
  - W. Lee, E. Kim, J. Kim, I. Lee, and C. Lee, "Movement-Aware Vertical Handoff of WLAN and Mobile WiMAX for Seamless Ubiquitous Access," *IEEE Transactions on Consumer Electronics*, 53(4):1268-1275, November 2007.
- RFID Expert Group President Award (2007) The 3rd RFID/USN Research Paper Contest
- ETRI President Award (2006) The 2nd RFID/USN Research Paper Contest
- Korea Association of RFID/USN (KARUS) President Award (2005) The 1st RFID/USN Research Paper Contest
- Scholarships for Academic Excellence (Fall 1999, Fall 2000) Korea University. Department of Computer Science and Engineering

## Research and Academic Excellence of the Students under Joongheon Kim's Supervision

- Excellence Paper Award (02/2022) 2022 KICS Winter Conference (with Y. Kim, Y.K. Lee, S. Jung)
- ICT Express Best Reviewer Award (2021) ICT Express (Elsevier) (Awarded to Soohyun Park)
- ICT Express Best Reviewer Award (2021) ICT Express (Elsevier) (Awarded to Haemin Lee)
- Haedong Paper Award (06/2021) 2021 KICS Summer Conference (with H. Baek, Y.J. Ha, M. Yoo, S. Jung)
- Excellence Paper Award (06/2021) 2021 KICS Summer Conference (with B. Lim, W.J. Yun, Y.-C. Ko)
- Excellence Paper Award (Undergraduate) (06/2021) 2021 KICS Summer Conference (with G. Lee, W.J. Yun, S. Jung)
- Encouragement Paper Award (11/2020) 2020 KICS Fall Conference (with W.J. Yun)
- Encouragement Paper Award (06/2020) 2020 KICS Summer Conference (with W.J. Yun)
- Encouragement Paper Award (02/2020) 2020 KICS Winter Conference (with S. Oh, J. Choi)
- Encouragement Paper Award (02/2020) 2020 KICS Winter Conference (with J. Kim)

## Teaching and Supervision Excellence

• Granite Tower Best Teaching Award (Top 5%) – Korea University (Computer Language and Lab, EGRN151)	Fall 2021
• Best Teaching Award (Top 20%) – Korea University (Object Oriented Programming, SEMI104)	Fall 2021
• Granite Tower Best Teaching Award (Top 5%) – Korea University (Introduction to Computers, SEMI103)	Spring 2021
<ul> <li>Best Teaching Award (Top 20%) – Korea University (Probability and Random Process, KECE209)</li> </ul>	Spring 2021
• Best Teaching Award (Top 20%) – Korea University (Computer Language and Lab, EGRN151)	Fall 2020
• Granite Tower Best Teaching Award (Top 5%) – Korea University (Computer Language and Lab, EGRN151)	Fall 2019

#### Academic and University Services

- Outstanding Contribution Award (02/2022) KIISE Information Network Society
- Outstanding Contribution Award (12/2021) Open Standards and ICT Association (OSIA)
- Outstanding Contribution Award (11/2021) KICS
- **Appreciation Recognition (10/2021)** *Daegu Gyeongbuk Institute of Science and Technology (DGIST)*
- Outstanding Contribution Award (11/2019) KICS
- Fellow Employee Recognition [#3081146] (12/2014) Intel Corporation
- Certificate of Appreciation (09/2010) Department of Computer Science, University of Southern California

#### **Business Administration**

• The 5th Hyundai/Kia Motors Marketing Forum (02/2004), 2nd Prize Winner (Sales Promotion)

Funded by Hyundai NGV and Hyundai/Kia Motors Company [Grant: \$59,500; Primary-PI]

A Priori Techniques Research for Efficient Multi-Edge Computing

Funded by Samsung Electronics Software Center [Grant: \$80,000; Co-PI]

## R&D Projects (Totally, 5,468,384 USD $\approx$ 5,468,384,000 KRW)

## **Industry-Funded Projects**

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• Mapping between Real World and Virtual Reality (VR) for End-Edged Cloud Real-Time VR Servers	09/2020-09/2024	
Funded by Samsung Electronics – Samsung Advanced Institute of Technology [Grant: \$286,000; Primary-PI]		
Cellular/Wi-Fi Handover Technology Development	02/2022-12/2022	
Funded by LG Electronics CTO Division – Smart Mobility Lab., Advanced R&BD Center [Grant: \$88,000; Primary-PI]		
Research Trends in Digital Twin Applications to Autonomous Driving	03/2022-04/2022	
Funded by <i>Hyundai NGV</i> [Grant: \$1,000; Primary-PI]		
Distributed Learning System Design and Implementation for Clinical Applications	02/2022-03/2022	
Funded by Cipherome [Grant: \$15,000; 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]		
<ul> <li>Visual Recognition Software Implementation using Deep Learning Tools</li> </ul>	05/2019–11/2019	

06/2017-12/2017

#### University/Center-Level Projects • Intelligent 6G Wireless Access System Research Center 04/2021-12/2025 Funded by Institute for ICT Promotion (IITP) [2021-0-00467, Grant: \$154,000 (2 yrs); Co-PI] Nano UAV Intelligence Systems Research Lab (NUiSRL) – ADD Military Special Research Center 10/2020-12/2022 Funded by Agency for Defense Development (ADD) [UD200027ED, Grant: \$130,000; Co-PI], PI: Kwangwoon University (Korea) 5G/Unmanned Vehicle Research Center (5G/UV-RC) – ITRC 06/2020-12/2022 Funded by Institute for ICT Promotion (IITP) [2020-0-01637, Grant: \$55,709; Co-PI], PI: Hanyang University (Korea) • Human Resource Development for the Biomedical Unstructured Big Data Analysis – ITRC 08/2018-12/2021 Funded by Institute for ICT Promotion (IITP) [2018-0-01833; Co-PI], PI: Seoul National University Hospital (Korea) 02/2020-05/2020 • Intelligent Internet of Energy (IoE) Data Research Center – ITRC Funded by *Institute for ICT Promotion (IITP)* [2018-0-01396; Co-PI], PI: Kookmin University (Korea) Government-Funded Projects AI Bots Collaborative Platform and Self-Organizing Artificial Intelligence Technology Development 04/2022–12/2026 Funded by *Institute for ICT Promotion (IITP)* [xxx, Grant: \$950,000; Co-PI] Quantum Hyper-Driving: Quantum-Inspired Hyper-Connected and Hyper-Sensing **Autonomous Mobility Technologies** 03/2022-02/2025 Funded by National Research Foundation of Korea [2022R1A2C2004869, Grant: \$600,000; Primary-PI] K-Starlink: Dynamic Reconfigurable and Intelligent Space-Terrestrial Networks 06/2021-05/2024 Funded by National Research Foundation of Korea (Basic Research Lab) [2021R1A4A1030775, Grant: \$161,000 (2 yrs); Co-PI] Development of Integrated Development Framework that supports Automatic Neural Network Generation and Deployment optimized for Runtime Environment 04/2021-12/2023 Funded by Institute for ICT Promotion (IITP) [2018-0-00170, Grant: \$230,000; Co-PI] 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: \$503,250; Primary-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) 06/2018-06/2021 Funded by Institute for ICT Promotion (IITP) [2018-0-00170, Grant: \$246,464; Co-PI] • Distributed Secure Platform for Scalable Clinical OMOP CDM Models 04/2019-12/2020 Funded by Ministry of Health and Welfare [HI19C0572, Grant: \$90,000; 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 ICT Promotion (IITP)* [Grant: \$33,333; Primary-PI] Government-Funded Research Institute Projects • Autonomous Intelligent COA Search Methods for Cyber-Attacks 12/2021-11/2022 Funded by Agency for Defense Development (ADD) [xxx, Grant: \$100,000; Primary-PI] Research on Intelligent Agent-based CPS Security and Reliability 05/2021-11/2021 Funded by *Telecommunications Technology Association (TTA)* [Grant: \$48,000; Primary-PI] • 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] 05/2017-04/2019 Probabilistic Decision Making and Econometric Methods for Micro-Grid 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
   (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:

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: 4685+, H-Index: 31+, i10-Index: 107+; obtained from Google Scholar Profile (as of May 27, 2022)
- The Complete Journals List (totally, 106): https://sites.google.com/view/aimlab-kuee/publications/journals

## Dissertation, Books, and Book Chapters

#### ■ Ph.D. Dissertation

• <u>J. Kim</u>, *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.

#### **■** Books

• X. Lin, J. Zhang, Y. Liu, and J. Kim, Fundamentals of 6G Communications and Networking, Springer (Working in Progress).

## **■** Book Translation (from English to Korean)

• J. Choi, <u>J. Kim</u>, J. No, C. Sohn, D. Ahn, H. Ahn, H. Lee, and H. Jung, *Programming in ANSI C*, Haksan Media, January 2021 (8th Edition, ISBN: 979-1185294315)., Originally written by E. Balagurusamy (Publisher: McGraw Hill, ISBN: 978-9351343202, January 2019)

## **■** Book Chapters

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

### Top-Tier Conferences and IEEE Journals/Magazines

## ■ Top-Tier and Awarded Conference and Workshop Papers

[Review'22] W.J. Yun, J. Park, and J. Kim, NeurIPS (2022).

[Review'22] W.J. Yun, D. Mohaisen, S. Jung, J.-K. Kim, and J. Kim, ACM CIKM (2022).

[Review'22] M. Choi, W.J. Yun, and <u>J. Kim</u>, **IEEE WiOpt Workshop (2022) Caching, Computing and Delivery in Wireless Networks**.

[Review'22] W.J. Yun, J.P. Kim, S. Jung, J. Park, and J. Kim, ICML Workshop (2022) Dynamic Neural Networks.

[ICDCS'22] W.J. Yun, Y. Kwak, J.P. Kim, H. Cho, S. Jung, J. Park, and <u>J. Kim</u>, "Quantum Multi-Agent Reinforcement Learning via Variational Quantum Circuit Design," **IEEE ICDCS** (2022).

[INFOCOM'22] H. Baek, W.J. Yun, Y. Kwak, S. Jung, M. Ji, M. Bennis, J. Park, and J. Kim, "Joint Superposition Coding and Training for Federated Learning over Multi-Width Neural Networks," **IEEE INFOCOM (2022)**.

[ICML'21] 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," ICML Workshop (2021) Federated Learning for User Privacy and Data Confidentiality.

[ICOIN'21] 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 ICOIN (2021). (Best Paper Award)

[ICDCS'20] Ü. Meteriz, N.F. Yildiran, J. Kim, and D. Mohaisen, "Understanding the Potential Risks of Sharing Elevation Information on Fitness Applications," IEEE ICDCS (2020).

[ICML'20] M. Shin, C. Hwang, J. Kim, J. Park, M. Bennis, and S.-L. Kim, "XOR Mixup: Privacy-Preserving Data Augmentation for One-Shot Federated Learning," ICML Workshop (2020) Federated Learning for User Privacy and Data Confidentiality.

- [IJCAI'19] M. Shin and J. Kim, "Randomized Adversarial Imitation Learning for Autonomous Driving," IJCAI (2019).
- [ICDCS'18] S. Ahn, J. Kim, E. Lim, W. Choi, A. Mohaisen, and S. Kang, "ShmCaffe: A Distributed Deep Learning Platform with Shared Memory Buffer for HPC Architecture," IEEE ICDCS (2018).
- [MobiSys'18] M. Shin, J. Kim, A. Mohaisen, J. Park, and K.H. Lee, "Neural Network Syntax Analyzer for Embedded Standardized Deep Learning," ACM MobiSys Workshop (2018) Embedded and Mobile Deep Learning.
  - [MM'17] J. Koo, J. Yi, J. Kim, M.A. Hoque, and S. Choi, "REQUEST: Seamless Dynamic Adaptive Streaming over HTTP for Multi-Homed Smartphone under Resource Constraints," ACM Multimedia (2017).
  - [SOSP'15] S. Yoo, Y. Kim, S. Lee, S.-A. Lee, and J. Kim, "A Case for Bad big.LITTLE Switching: How to Scale Power-Performance in SI-HMP," ACM SOSP Workshop (2015) Power-Aware Computing and Systems.
- [MobiSys'10] J. Paek, <u>J. Kim</u>, and R. Govindan, "Energy-Efficient Rate-Adaptive GPS-based Positioning for Smartphones," ACM MobiSys (2010). (Citations: 619+)

## ■ IEEE Journals and Magazines, 66 publications

#### **◄** Revision ▶

- [TMBMC.review] J. Kim, W.J. Yun, and S. Jung, "Quantum Deep Learning for Max-Weight Scheduling in Molecular Communications," *IEEE Transactions on Molecular, Biological, and Multi-Scale Communications*, (Review, 05-May-2022).
  - [TMC.major] U. Meteriz, N.F. Yildiran, J. Kim, and D. Mohaisen, "Learning Location from Shared Elevation Profiles in Fitness Apps: A Privacy Perspective," *IEEE Transactions on Mobile Computing*, (1st Revision, 21-Jun-2021).
  - [JCN.major] H. Lee, S. Kwon, S. Jung, and J. Kim, "Neural Myerson Auction for Truthful and Energy-Efficient Autonomous Aerial Data Delivery," *IEEE/KICS Journal of Communications and Networks*, (Review after 1st Revision, 07-May-2022).
  - [TNNLS.minor] W.J. Yun, M. Shin, D. Mohaisen, K. Lee, and <u>J. Kim</u>, "Hierarchical Deep Reinforcement Learning-based Propofol Infusion Assistant Framework in Anesthesia," *IEEE Transactions on Neural Networks and Learning Systems*, (Review after Minor Revision, 23-Apr-2022).
    - [TITS.major] W.J. Yun, S. Park, J. Kim, and D. Mohaisen, "Self-Configurable Stabilized Real-Time Detection Learning for Autonomous Driving Applications," *IEEE Transactions on Intelligent Transportation Systems*, (Review after 2nd Revision, 26-Feb-2022).

#### **◄** 2022 ►

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- [TVT'22.02] W.J. Yun, D. Kwon, M. Choi, <u>J. Kim</u>, G. Caire, and A.F. Molisch, "Quality-Aware Deep Reinforcement Learning for Streaming in Infrastructure-Assisted Connected Vehicles," *IEEE Transactions on Vehicular Technology*, 71(2):2002–2017, February 2022.

#### **◄** 2021 ►

- [ISJ'21.09] S. Jung, <u>J. Kim</u>, and J.-H. Kim, "Intelligent Active Queue Management for Stabilized QoS Guarantees in 5G Mobile Networks," *IEEE Systems Journal*, 15(3):4293–4302, September 2021.
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#### **◄** 2017 ►

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#### **◄** 2016 ►

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- [TON'16.08] <u>J. Kim</u>, G. Caire, and A.F. Molisch, "Quality-Aware Streaming and Scheduling for Device-to-Device Video Delivery," *IEEE/ACM Transactions on Networking*, 24(4):2319–2331, August 2016., (*Best Reading Papers in Device-to-Device Communications by IEEE Communications Society*), (*Citations: 130+*)

#### **◄** 2007-2015 ▶

- [TII'15.12] <u>J. Kim</u>, "Energy-Efficient Dynamic Packet Downloading for Medical IoT Platforms," *IEEE Transactions on Industrial Informatics*, 11(6):1653–1659, December 2015.
- [TSMC'15.11] <u>J. Kim</u> and W. Lee, "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.
  - [JCN'14.10] <u>J. Kim</u> and A.F. Molisch, "Fast Millimeter-Wave Beam Training with Receive Beamforming," *IEEE/KICS Journal of Communications and Networks*, 16(5):512–522, October 2014.
  - [CL'14.09] S.-N. Hong and <u>J. Kim</u>, "Joint Coding and Stochastic Data Transmission for Uplink Cloud Radio Access Networks," *IEEE Communications Letters*, 18(9):1619–1622, September 2014.
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  - [CL'14.03] <u>J. Kim</u>, A. Mohaisen, and J.-K. Kim, "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.
  - [TBC'13.09] <u>J. Kim</u>, Y. Tian, S. Mangold, and A.F. Molisch, "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.
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  - [TCE'07.05] <u>J. Kim</u>, W. Lee, E. Kim, D.-W. Kim, and H. Kim, "Coverage-Time Optimized Dynamic Clustering of Networked Sensors for Pervasive Home Networking," *IEEE Transactions on Consumer Electronics*, 53(2):433–441, May 2007.
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#### Patents (Granted), totally 62

- 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)
- 17 Korean Patents: (KR 102370599), (KR 102340895), (KR 102293287), (KR 102244380), (KR 102240442), (KR 102240425), (KR 102234007), (KR 102178895), (KR 102167344), (KR 102052835), (KR 102015429), (KR 101663613), (KR 101619964), (KR 101606951), (KR 101567829), (KR 101558017), (KR 100779165)
- 7 European Patents: (EP 3255730), (EP 2441203), (EP 2422578), (EP 2343836), (EP 2282601), (EP 2262342), (EP 2260669)
- 11 Chinese Patents: (CN 107634349), (CN 102461318), (CN 102461050), (CN 102388658), (CN 102349340), (CN 102342162), (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 Graduate Courses, Faculty Member
  - IT R&D Policies 1 (ECE723): Fall 2020
  - Design and Analysis of Wireless Communication Systems (ECE721): Spring 2021
  - Smart Mobile Platform (ECE654): Fall 2021, Fall 2020, Fall 2019

- Advanced Topics in Socialware IT (ECE545): Spring 2022
- Wireless and Mobile Networks (ECE522): Spring 2020
- Wireless Network 1 (ITH524), Graduate School of Engineering and Technology: Spring 2021

#### ■ Korea University – Undergraduate Courses, Faculty Member

- Introduction to Artificial Intelligence (IWC420): Winter 2021 (12/2021–01/2022)
- Data Communications (KECE316): Fall 2020
- Digital System Design and Laboratory (KECE210): Fall 2020
- Probability and Random Process (KECE209): Spring 2022, Spring 2021 (Best Teaching Award, Top 20%), Spring 2020
- *Digital System (KECE207):* Spring 2020
- Computer Language and Laboratory (EGRN151): Fall 2021 (Granite Tower Best Teaching Award, Top 5%), Fall 2020 (Best Teaching Award, Top 20%), Fall 2019 (Granite Tower Best Teaching Award, Top 5%)
- Object-Oriented Programming (SEMI104): Fall 2021 (Best Teaching Award, Top 20%)
- Introduction to Computers (SEMI103): Spring 2021 (Granite Tower Best Teaching Award, Top 5%)
- Future Mobility Technology (GEQR075): Spring 2022

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

- Optimal Design Theory and Applications (Graduate Course): Spring 2019, Spring 2018, Spring 2017
- Topics in Computer Science and Engineering (Graduate Course): Fall 2018, Fall 2017, Fall 2016
- Numerical Analysis (Undergraduate Course): Spring 2019
- Compiler Design (Undergraduate Course): Spring 2019, Spring 2018, Spring 2017
- Principles of Programming Languages (Undergraduate Course): Fall 2018, Fall 2017, Fall 2016
- Algorithm Analysis (Undergraduate Course): Fall 2016
- Operating Systems (Undergraduate Course): Spring 2017, Spring 2016
- Calculus (Undergraduate Course): Spring 2017, Spring 2016
- Mobile Application Development (Undergraduate Course): 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)
   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) (Ph.D. Advisor: Prof. Jaekyun Moon at Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea) Currently, Assistant Professor at Kyung Hee University, Suwon, Korea
- Dr. Soyi Jung (03/2021–08/2021), jointly with University of California at Irvine (co-advised by Prof. Marco Levorato) (Ph.D. Advisor: Prof. Jae-Hyun Kim at Ajou University, Suwon, Korea) Currently, Assistant Professor at Hallym University, Chuncheon, Korea
- Dr. Ju-Hyung Lee (08/2021–), jointly with University of Southern California (co-advised by Prof. Andreas F. Molisch) (Ph.D. Advisor: Prof. Young-Chai Ko at Korea University, Seoul, Korea)

## ■ Ph.D. Course Students and Alumni

- Soohyun Park (03/2019–02/2024 (expected))
- Haemin Lee (09/2020–02/2025 (expected))
- Won Joon Yun (03/2021–08/2024 (expected))
- Hyunsoo Lee (03/2021–)
- Hankyul Baek (03/2021-)
- Seok Bin Son (03/2022–)
- Jae Pyoung Kim (03/2023–)

#### ■ Ph.D. Course Students and Alumni (Tight Collaboration for Ph.D. Dissertation)

- Minseok Choi (Advisor: Prof. Jaekyun Moon at KAIST), Professor at Kyung Hee University, Suwon, Korea
- Laihyuk Park (Advisor: Prof. Sungrae Cho at CAU), Professor at Seoul National University of Science and Technology, Seoul, Korea
- Shinyoung Ahn (Advisor: Prof. Sungwon Kang at KAIST), Researcher at ETRI, Daejeon, Korea
- Jonghoe Koo (Advisor: Prof. Sunghyun Choi at SNU), Researcher at Samsung Research, Seoul, Korea
- Seungyo Ryu (Advisor: Prof. Dongseung Kim at Korea University), Researcher at LG Electronics, Changwon, Korea
- Soyi Jung (Advisor: Prof. Jae-Hyun Kim at Ajou University), Professor at Hallym University, Chuncheon, Korea
- Joo Yong Shim (Advisor: Prof. Jong-Kook Kim at Korea University)

### ■ M.S. Course Students and Alumni

- Kyeongseon Kim (09/2017–08/2019), Researcher at LG Electronics AI Research, Seoul, Korea
- Dohyun Kwon (03/2018–02/2020), Researcher at Hyundai Motors Group, Uiwang, Korea
- Dohyun Kim (03/2018–02/2020), Researcher at Naver Corporation, Seongnam, Korea
- MyungJae Shin (03/2018–02/2020), Engineer at mofl (startup), Daejeon, Korea
- Jaeho Choi (03/2019–02/2021), Researcher (Military Service Exception) at Korea Meteorological Administration, Seoul, Korea
- Youngkee Kim (03/2021–02/2023), Researcher at Korea Electronics Technology Institute (KETI), 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 Kyung Hee University, Suwon, 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**

## Talks and Presentations (Selected)

#### **■** IEEE Distinguished Lectures

Federated Learning for Medical and Mobile Platforms: Motivation, Challenges, and Potential Solutions
 California State University, Long Beach (Long Beach, CA, USA, 01/2020), Hosted by Prof. Sean Kwon and Prof. Henry Yeh IEEE Systems Council – IEEE Coastal Los Angeles Section Chapter

#### **■** IEEE Conference Tutorials and Special Session Talks

- IEEE ICOIN 2022 Tutorial (Online, 01/2022), Advanced Deep Learning Methods for Autonomous Mobility
- IEEE ICUFN 2021 Tutorial (Jeju, Korea, 08/2021), Distributed and Split Deep Learning: Theory and Applications
- IEEE ICAIIC 2021 Tutorial (Online, 04/2021), Multi-Agent Deep Reinforcement Learning for Connected and Autonomous Vehicles
- IEEE ICTC 2019 Special Session Talk (Jeju, Korea, 10/2019), Advanced Deep Learning Methods and Their Applications to Distributed and Network Platforms
- IEEE ICOIN 2019 Tutorial (Kuala Lumpur, Malaysia, 01/2019), Distributed Platform Research for Emerging Deep Learning Applications
- IEEE ICC 2018 Tutorial (Kansas City, MO, USA, 05/2018), Securing the Internet of Things: A Machine Learning Approach (Making Machine Learning Practical), Joint Presentation wih Prof. Aziz Mohaisen (University of Central Florida, Orlando, FL, USA)

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

• Spatio-Temporal Slit Learning for Privacy-Preserving OCR Applications

Huawei Research Center (Text-Aware Image Understanding Workshop) (Online, 11/2021)

• AI/ML Technologies in Beyond 5G/6G

Ericsson-LG (R&D Hackathon / AI Learning Challenge - Keynote Speech) (Seoul, Korea, 05/2021)

• XOR Mixup: Privacy-Preserving Data Augmentation for One-Shot Federated Learning

Huawei Research Center (Deep Learning/Machine Learning for Computer Vision) (Online, 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)

#### ■ Invited Talks at Korean Research Institutes

- A.I. Technology Trends and Applications; Korea Meteorological Administration (Online, 09/2021)
- Deep Reinforcement Learning: Trends and Applications; SK Telecom (SKT) (Seoul, Korea, 06/2021)
- Trends in AI R&D for Edge/Mobile Platforms; SK Hynix (Icheon, Korea, 09/2020)
- Lyapunov Optimization and AI Applications to Mobility Platforms; Naver Labs Robotics Lab (Pankyo, Korea, 06/2020)
- Distributed AI: Trends and Issues; ETRI (Daejeon, Korea, 05/2020)
- Federated Learning and Imitation Learning; ETRI (Kwangju, Korea, 02/2020)
- Federated and Imitation Learning; KT AI Tech Center (Seoul, Korea, 12/2019)
- Adversarial Imitation Learning and Federated Learning; ETRI (Daejeon, Korea, 12/2019)
- Distributed Learning and Deep Reinforcement Learning; ETRI (Daejeon, Korea, 12/2019)
- mmWave Radar and Sensors: Theory and Applications; LG Electronics (Seoul, Korea, 11/2019)
- Advanced Topics in Machine/Deep Learning; Posco ICT (Pankyo, Korea, 11/2019)
- mmWave Communications and Radar: Theory and Applications; ETRI (Daejeon, Korea, 11/2019)
- 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)
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