JAEBUM PARK

Graduate Student Researcher & Ph.D. Student
Department of Electrical and Computer Engineering** at **University of California, San Diego (UCSD)
Former Staff Engineer** at **Samsung Research
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RESEARCH INTERESTS

Wireless Digital Communications, Mobile Communications, Physical Layer Algorithm

- Massive MIMO Techniques and Modem Algorithms toward 6G Candidate Frequency Bands
- Next generation RAN architectures (Open RAN, virtualized RAN)
- AI/ML-based digital predistortion (DPD)
- Energy-efficient RAN
- 3GPP RAN1 Standards (4G LTE, 5G NR)

EDUCATION

University of California, San Diego (UCSD)
Ph.D. Student in Electrical & Computer Engineering
San Diego, CA, USA
Sep. 2024 - Present

- Thesis: TBD
- Wireless Systems Innovation Laboratory (WSIL)
- Advisor: *Prof. Robert W. Heath, Jr.*

Korea Advanced Institute of Science and Technology (KAIST)
M.S. in Electrical & Electronic Engineering
Daejeon, S. Korea
Feb. 2017

- Thesis: "Reduced Feedback Beamforming with Large Antenna Array in Wireless Backhaul Downlink System"
- Laboratory for Information Transmission (LIT), KAIST
- Advisor: *Prof. Hyuncheol Park*

Yonsei University
B.S. in Electrical & Electronic Engineering
Seoul, S. Korea
Feb. 2015

- Completed mandatory military service during this period (Mar. 2010 – Jan. 2012)
- Communications & Network Laboratories, Yonsei University
- Advisor: *Prof. Jong-Moon, Chung*
- Received A+ grades in all mathematics-related subjects

PUBLICATIONS

[Journal]

Jaebum Park and Robert W. Heath, Jr., "Two-Timescale Receive Combining for Fronthaul-Constrained Uplink XL-MIMO with Visibility Regions," in preparation for submission to *IEEE Transactions on Wireless Communications*, 2027.

Jaebum Park, Yutao Xie, Amitava Ghosh, Yuanyuan Shi, and Robert W. Heath, Jr., "Carbon-Aware Joint Resource and Energy Scheduling for Cellular Base Stations," submitted to *IEEE Communications Letters*, 2026.

Seunghun Lee, **Jaebum Park**, Hyuncheol Park, and Robert W. Heath, Jr., "Distributed Graph Neural Network for Scalable Beam Configuration in Cell-Free MIMO Networks," in preparation for submission to *IEEE Transactions on Wireless Communications*, 2026.

Jaebum Park, Chan-Byoung Chae, and Robert W. Heath, Jr., "Energy Efficiency Optimization in Distributed MIMO vRAN via Cross-Layer Link Abstraction," *IEEE Transactions on Wireless Communications, under revision*, 2026.

Boyu Ning, Yike Xie, **Jaebum Park**, Songjie Yang, Weidong Mei, Emil Björnson, and Robert W. Heath, Jr., "Broadcasting in Centimeter-Wave G-MIMO Communication Systems: Beam Shaping is All You Need," *IEEE Transactions on Wireless Communications,* 2026.

Jaebum Park, Chan-Byoung Chae, and Robert W. Heath, Jr., "Accelerating vRAN and O-RAN with SIMD: Architectural Perspectives and Performance Evaluation," *IEEE Communications Magazine*, vol. 64, no. 11, 2026.

Boyu Ning, Haifan Yin, Sixu Liu, Hao Deng, Songjie Yang, Yuchen Zhang, Weidong Mei, David Gesbert, **Jaebum Park**, Robert W. Heath, Jr., and Emil Björnson, "Precoding Matrix Indicator in the 5G NR Protocol: A Tutorial on 3GPP Beamforming Codebooks," *IEEE Communications Surveys & Tutorials*, vol. 28, pp. 4581-4623, 2026.

Jaebum Park, Girim Kwon, and Hyuncheol Park, "Reduced Feedback Beamforming with a Large Antenna Array in Wireless Backhaul Downlink Systems," 2016 The Journal of Korean Institute of Communications and Information Sciences (J-KICS), 41(12), 1903-1913.

PUBLICATIONS [Conference]

Jaebum Park, Chan-Byoung Chae, and Robert W. Heath, Jr., "Energy Efficiency Optimization for 5G NR PDSCH: A Cross-Layer Link Abstraction Framework," submitted to *IEEE ICC*, Washington, DC, USA, 2027.

Jaebum Park and Robert W. Heath, Jr., "Fronthaul-constrained low-rank RX combiner design for uplink XL-MIMO," *2026 60th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, USA, 2026.

Jaebum Park, Chan-Byoung Chae, and Robert W. Heath, Jr., "Switch-DFT: Adaptive Waveform and MIMO Switching for Energy-Efficient Base Stations," in *Proc. 2026 IEEE ICC Workshops*, Glasgow, UK, 2026, pp. 1-6.

Hyungsik Han, **Jaebum Park**, Jungmin Kim, Kitaek Bae, and Ilju Na, "Baseband Phase Noise Modeling and Analysis for 140 GHz THz DFT-s-OFDM System," in *Proc. 2022 IEEE Globecom Workshops*, Rio de Janeiro, Brazil, 2022, pp. 1748-1753.

Girim Kwon, **Jaebum Park,** and Hyuncheol Park, "A Two-stage Beamforming Scheme using Location Information in Massive MIMO Wireless Backhaul Channel," in *Proc. Symposium of the Korean Institute of Communications and Information Sciences*, 2017, 536-536.

Jaebum Park, Girim Kwon, and Hyuncheol Park, "A Study on Antenna Structures for Beamforming in Massive MIMO Wireless Backhaul Downlink System," in *Proc. Symposium of the Korean Institute of Communications and Information Sciences*, 2016, 1495-1496.

Girim Kwon, **Jaebum Park,** and Hyuncheol Park, "Time Resource Allocation of Time Division Transmission Scheme in Massive MIMO Wireless Backhaul Downlink System," in *Proc. Symposium of the Korean Institute of Communications and Information Sciences*, 2016, 52-53.

PATENTS

Jaebum Park, Youngjoon Kim, Sunho Park, Jiyeong Yang, Chanuk Jeong, "Apparatus and Method for Performing Port Combining in Wireless Communication System," KR/US patent, Application Number: 10-2023-0181792, Dec. 14, 2023 (U.S. counterpart application pending)

Youngjoon Kim, Daejung Yoon, **Jaebum Park**, Jiyeong Yang, Chanuk Jeong, "Method and Apparatus Using SVD-based Port Combining Signaling for O-DU," KR/US patent, Application Number: 10-2023-0178721, Dec. 11, 2023 (U.S. counterpart application pending)

Jaeha Lee, Taehyeong Kim, Hyunjung Nam, **Jaebum Park**, Joonah Park, "Electronic Apparatus and Controlling Method Thereof," US patent, Publication Number: 12094129, Sep. 17, 2024

Jaeyong Ju, Hyeran Lee, Hyunjung Nam, Miyoung Kim, **Jaebum Park**, Joonah Park, "Mobile Robot and Driving Method Thereof," US patent, Publication Number: 11801602, Oct. 31, 2023

TALKS AND PRESENTATIONS

Conference presentations

"Fronthaul-Constrained Low-Rank RX Combiner Design for Uplink XL-MIMO," Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, USA, Oct. 2026

"Switch-DFT: Adaptive Waveform and MIMO Switching for Energy-Efficient Base Stations," IEEE ICC 2026 Workshop on Open RAN, Glasgow, UK, Jun. 2026

Poster Presentations

"Fronthaul-constrained low-rank RX combiner design for uplink XL-MIMO," UCSD CWC Research Review, San Diego, CA, USA, Oct. 2026

"3D Spatio-Temporal Traffic-Aware Energy Efficiency Optimization for Distributed MIMO Systems," UCSD Research Expo, San Diego, CA, USA, Apr. 2026

"Accelerating MIMO Algorithms in vRAN/O-RAN Architecture," San Diego Wireless Summit, San Diego, CA, USA, Jan. 2026

"Accelerating MIMO Algorithms in vRAN/O-RAN Architecture," UCSD CWC Research Review, San Diego, CA, USA, May 2025

"Accelerating MIMO Algorithms in vRAN/O-RAN Architectures," UCSD Research Expo, San Diego, CA, USA, Apr. 2025

Talks and Seminar

"ECE Department Seminar," KAIST, Daejeon, South Korea, Jul. 2026

"Research Presentation," NGWN Lab., University of Seoul, Seoul, South Korea, Jul. 2026

"Research Presentation," Intelligent Networking Lab., Yonsei University, Seoul, South Korea, Oct. 2025

EXPERIENCE AND PROJECTS

Center for Wireless Communications (CWC), UCSD

San Diego, CA, USA
Sep. 2024 - Present

1) Nokia Bell Labs Project (Oct. 2025 – Present)
   - Energy and Cabon for Wireless (1 letter paper published)
   - Energy-Efficient G-agnostic RAN through Software-Defined Baseband and Adaptive Fronthaul (current)

2) Graduate Student Researcher (GSR)
   - Developing energy-efficient MIMO algorithms for next generation RAN
   - AI/ML-based digital predistortion (DPD) technique

Samsung Research (SR), Samsung Electronics

Engineer (2017 – 2022) / Staff Engineer (2023 - 2024)

Seoul, S. Korea
Jan. 2017 - Aug. 2024

1) vRAN Development Project for AI-RAN (on assignment to the Samsung Networks Business, Jan. 2024 – Aug. 2024)
   - Developed and tested vDU software for the North American market on COTS servers (HPE / DELL)
   - Validated cloud-native/containerized vDU deployments and verified PHY-layer performance
   - Contributed to O-RAN compliant vRAN platform

2) Task on Uplink Performance Improvement (ULPI) in O-RAN
   - Developed an advanced MIMO receiver to optimize the O-RAN functional split option 7-2x
   - Proposed a low-complexity SVD-based compression method (2 patents)

3) 6G Testbed (TB) Development Project
- Demonstrate a 100 Gbps transmission at the Samsung Tech Fair 2022
- Defined 6G THz TB Key Performance Indicators (KPIs) & Specification (PDSCH, PUSCH, PDCCH, PUCCH, SSB, PRACH)
- Created a Link-Level Simulator (LLS) for 6G TB (Floating/Fixed Point Modeling)
- Implemented RTL projects for 6G TB hardware FPGA Platform
- Developed MIMO receiver algorithms toward 6G candidate frequency bands (e.g., sub-THz, FR3)

4) AI-based Smart Machine Development Project
- Improved the accuracy of lane detection algorithm for autonomous driving by using deep learning, such as convolutional neural network (CNN)
- Created the human following algorithm for healthcare robots by combining various kinds of sensor data
- Showcased the Samsung Bot at 2019 CES, Las Vegas, U.S.

Korea Advanced Institute of Science and Technology (KAIST)

1) Research Assistant (RA)
- Performed modeling of a ray-tracing based clustered delay line (CDL) channel
- Designed beamforming matrices based on reduced feedback
- Wireless Backhaul Downlink Systems Project, sponsored by ETRI
- Advisor: *Prof. Hyuncheol Park*

Daejeon, S. Korea
Jan. 2015 - Dec. 2016

2) Teaching Assistant (TA)
- Served as a TA for undergraduate experimental subjects, such as C++ Programming and Electronic & Electrical Circuit Design
- Provided mentoring to undergraduate students

Yonsei University

Undergraduate Internship Student

Seoul, S. Korea
Jan. 2014 – Jul. 2014

- Communications & Network Laboratories, Yonsei University
- Advisor: *Prof. Jong-Moon, Chung*

AWARDS AND SCHOLARSHIPS

IEEE ICC 2026 Travel Grant — 2026.05
- NSF Student Travel Grant for ICC 2026

National Scholarships — 2015 - 2017
- Tuition exemption and full scholarship during master's program

Honor Scholarships — 2008 - 2015
- 4 scholarships for academic excellence out of 8 undergraduate semesters

Undergraduate Thesis Award — 2014
- Creative Engineering Scholarship
- Award for the most outstanding undergraduate thesis

1st Award of Mathematical Contest — 2012
- 1st prize out of 300 students

Dean's List Award — 2012
- Honors Program for the most outstanding student
- GPA of 4.42/4.5 (All A+ grades except for one A)

COMPUTER SKILLS	MATLAB, C/C++, Python, Verilog, RTL, Github, Linux OS, etc.
HOBBIES AND PERSONAL INTERESTS	Ice hockey player for 20 years. Also enjoying golf, soccer, and other sports.