

Jiwon Sung

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🌐 <https://sunione.github.io>

EDUCATION

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| Korea Advanced Institute of Science and Technology (KAIST) | Feb. 2024 – Present |
| <i>M.S. in Electrical Engineering</i> 4.12/4.3 GPA | Daejeon, Korea |
| <ul style="list-style-type: none">• <u>Committee</u>: Jinseok Choi (<i>chair</i>), Junil Choi, Joonhyuk Kang• <u>Dissertation</u>: Tracking Algorithm for Hybrid Calibration of Time-Interleaved ADCs | |
| Ulsan National Institute of Science and Technology (UNIST) | Feb. 2018 – Feb. 2024 |
| <i>B.S. in Electrical Engineering</i> 4.15/4.3 GPA (Ranked 1/51) <i>Summa Cum Laude</i> | Ulsan, Korea |

RESEARCH INTERESTS

Wireless Communications, Estimation, Sensing, Statistical Signal Processing, and Machine Learning

RESEARCH EXPERIENCE

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| TASC Lab | Aug. 2025 – Jan. 2026 |
| <i>Purdue University</i> Advisor: Prof. David J. Love | West Lafayette, IN, USA |

Near-Field Velocity Sensing on an Extended Target

- Currently working on near-field extended target tracking and comparing it with the point target scenario

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| SIC-X LAB | July 2023 – Aug. 2025 |
| <i>KAIST</i> Advisor: Prof. Jinseok Choi | Daejeon, Korea |

Power-Efficient Rate-Splitting Multiple Access (RSMA) Precoding

- Developed a power-efficient and low-complexity MIMO-RSMA beamforming design that jointly optimizes the precoder, the set of active antennas, and the transmit power for a given total power budget at a base station
- Numerical results showed a new insight: medium-resolution DACs with 8 ~ 11 bits may be more power efficient than low-resolution DACs with 3 ~ 5 bits when utilizing the full potential of the available power at the base station

Time-Interleaved ADC (TI-ADC) Mismatch Error Estimation and Compensation

- Developed a hybrid calibration algorithm for correcting offset, gain, and timing mismatch errors in TI-ADCs using the extended Kalman filter for estimation and a combination of a truncated fractional delay filter and a high-pass filter for compensation
- Our algorithm achieved 10× lower reconstruction error, did not require an FIR filter coefficient optimization, and was the first work in the literature to model time-varying mismatch errors

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| InfoLab | Mar. 2023 – July 2023 |
| <i>KAIST</i> Advisor: Prof. Si-Hyeon Lee | Daejeon, Korea |

Local Differential Privacy (LDP) in Graph Data

- Applied LDP to decentralized graph data such that privacy is preserved while maintaining local graph statistics
- Proposed a degree-preserving asymmetric bit-flipping scheme that satisfies edge-LDP constraints
- Numerical results showed that the proposed method produced good results for coreness, a metric that quantifies users' influence in a graph
- Our method could be applied to scenarios where the task is to find potential super-spreaders in an epidemic outbreak using people's sensitive data so that the limited supply of vaccines is used on the most influential people

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| Lab. of Advanced Imaging Tech. | Apr. 2022 – Aug. 2022 |
| <i>UNIST</i> Advisor: Prof. Jaejun Yoo | Ulsan, Korea |

Image-to-Image Translation

- Studied generative adversarial networks (GANs) in the context of image-to-image translation
- Tried to make improvements on *TUNIT*, a multi-domain image-to-image translation paper that uses unlabeled datasets, by eliminating the "number of domains" hyperparameter using the Incremental DBSCAN algorithm

PUBLICATIONS

Journal Articles

- **Jiwon Sung**, Seokjun Park, and Jinseok Choi, “Power-Constrained and Quantized MIMO-RSMA Systems with Imperfect CSIT: Joint Precoding, Antenna Selection, and Power Control”, *IEEE Transactions on Wireless Communications* (under minor revision)
- **Jiwon Sung** and Jinseok Choi, “A New Interpretation of the Time-Interleaved ADC Mismatch Problem: A Tracking-Based Hybrid Calibration Approach”, *IEEE Signal Processing Letters*, vol. 32, pp. 3710–3714, 2025

International Conference Papers

- **Jiwon Sung**, Seokjun Park, and Jinseok Choi, “Joint Optimization for Power-Constrained MIMO Systems: Is Low-Resolution DAC Still Optimal?”, *2025 IEEE 101st Vehicular Technology Conference (VTC2025-Spring)*, Oslo, Norway, 2025, pp. 1-6
- Seokjun Park, **Jiwon Sung**, Jinseok Choi, Jeonghun Park, and Wonjae Shin, ”Maximizing Energy and Spectral Efficiency Tradeoff in MISO-RSMA Systems Under Coarse Quantization,” *2024 32nd European Signal Processing Conference (EUSIPCO)*, Lyon, France, 2024, pp. 857-861

WORK EXPERIENCE

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| Air Force Operations Command (AFOC) <i>Military Interpreter (English-Korean)</i> <i>Sergeant</i> | Oct. 2020 – Mar. 2022 <i>Pyeongtaek, Korea</i> |
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AWARDS AND SCHOLARSHIPS

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| Government-Sponsored Scholarship <ul style="list-style-type: none">• Near-full-tuition & stipend scholarship | Feb. 2024 – Feb. 2026 |
| National Science and Technology Scholarship <ul style="list-style-type: none">• Full-tuition & stipend scholarship | Feb. 2020 – Feb. 2024 |
| Semester Award <ul style="list-style-type: none">• Awarded to the top students with the highest GPA scores | 2018, 2019, 2020-Spring, 2022-Fall |
| Academic Performance Scholarship <ul style="list-style-type: none">• Full-tuition scholarship | Feb. 2018 – Feb. 2024 |

TEACHING AND MENTORING EXPERIENCE

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| Communication Theory (TA) <i>KAIST</i> | Feb. 2025 – June 2025 <i>Daejeon, Korea</i> |
| Undergraduate Internship Mentor <i>KAIST</i> | Sep. 2024 – Dec. 2024 <i>Daejeon, Korea</i> |
| <ul style="list-style-type: none">• Advised an undergraduate student’s thesis research• Research topic: joint channel and time-interleaved ADC mismatch compensation in OFDM systems | |
| Global Educational Program for Samsung Semiconductor (TA) <i>KAIST</i> | June 2024 – June 2025 <i>Daejeon, Korea</i> |
| Aramco Coding School <i>Saudi Arabian Oil Company</i> | Aug. 2022 – Nov. 2022 <i>Ulsan, Korea</i> |
| <ul style="list-style-type: none">• Developed an iOS application for protecting the environment with middle school students | |
| A.I. 4.0 Studio <i>UNIST</i> | May 2022 – Nov. 2022 <i>Ulsan, Korea</i> |
| <ul style="list-style-type: none">• Implemented <i>pix2pix</i> (image-to-image translation with cGAN) with high school students using TensorFlow | |
| Calculus I (TA) <i>UNIST</i> | Mar. 2020 – June 2020 <i>Ulsan, Korea</i> |
| Freshman English Camp (TA) <i>UNIST</i> | Jan. 2020 <i>Ulsan, Korea</i> |
| Contemporary Philosophy (TA) <i>UNIST</i> | Sep. 2019 – Dec. 2019 <i>Ulsan, Korea</i> |
| Ulju-gun Science Mentoring for the Gifted <i>UNIST</i> | Jan. 2019 <i>Ulsan, Korea</i> |
| <ul style="list-style-type: none">• Taught algebra for middle school students during a 3-week camp | |