

# Jiwon Sung

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🌐 <https://sunione.github.io>

## EDUCATION

<b>Korea Advanced Institute of Science and Technology (KAIST)</b>	Feb. 2024 – Present
<i>M.S. in Electrical Engineering</i>   4.12/4.3 GPA	Daejeon, Korea
• <u>Committee</u> : Jinseok Choi ( <i>chair</i> ), Junil Choi, Joonhyuk Kang	
• <u>Dissertation</u> : Tracking Algorithm for Hybrid Calibration of Time-Interleaved ADCs	
<b>Ulsan National Institute of Science and Technology (UNIST)</b>	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

<b>TASC Lab</b>	Aug. 2025 – Present
<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

<b>SIC-X LAB</b>	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

<b>InfoLab</b>	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

<b>Lab. of Advanced Imaging Tech.</b>	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

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### 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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<b>Air Force Operations Command (AFOC)</b> <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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<b>Government-Sponsored Scholarship</b> <ul style="list-style-type: none"><li>• Near-full-tuition &amp; stipend scholarship</li></ul>	Feb. 2024 – Feb. 2026
<b>National Science and Technology Scholarship</b> <ul style="list-style-type: none"><li>• Full-tuition &amp; stipend scholarship</li></ul>	Feb. 2020 – Feb. 2024
<b>Semester Award</b> <ul style="list-style-type: none"><li>• Awarded to the top students with the highest GPA scores</li></ul>	2018, 2019, 2020-Spring, 2022-Fall
<b>Academic Performance Scholarship</b> <ul style="list-style-type: none"><li>• Full-tuition scholarship</li></ul>	Feb. 2018 – Feb. 2024

## TEACHING AND MENTORING EXPERIENCE

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