DONGGU LEE

INFORMATION

Dept. of Electrical and Computer Engineering, North Carolina State University, Raleigh, NC, USA.

E-mail: dlee42@ncsu.edu

Google Scholar Profile: https://scholar.google.com/citations?user=nBGrpW8AAAAJ&hl=en

Linkedin Profile: https://www.linkedin.com/in/donggu-lee-dl/

PROFESSIONAL SUMMARY

Ph.D. candidate in Electrical & Computer Engineering at North Carolina State University. Experienced in designing and implementing simulation frameworks, analyzing field measurement data, and developing adaptive wireless algorithms. **Expected to graduate in May 2026. Seeking a research internship/Co-op position** in next-generation wireless and UAV communication systems.

EDUCATION

Ph.D., Electrical and Computer Engineering

North Carolina State University, Raleigh, NC, USA   *August 2022 - May 2026 (Expected)*

Master of Science, Electronic Convergence Engineering

Kwangwoon University, Seoul, South Korea   *March 2019 - February 2021*

Bachelor of Science, Electronic Convergence Engineering

Kwangwoon University, Seoul, South Korea   *March 2012 - February 2019*

TECHNICAL SKILLS

Modeling and Analysis	MATLAB, Python
Simulation Tools	Sionna, Tensorflow, MATLAB Toolboxes (LTE, 5G, WLAN, etc.)
Wireless Systems	UAV communications, 4G/5G, Wi-Fi, MIMO

SELECTED RESEARCH PROJECTS

Ray Tracing Analysis for UAV Networks in Dense-Foliage Rural Areas

- Developed NVIDIA Sionna-based simulation integrating foliage models, analyzing MIMO channel rank and coverage.

- Adopted Kriging interpolation scheme to predict channel rank by using spatial correlation of UAV MIMO channels.

- Analyzed and compared real-world measurements with ray tracing simulation results.

Uplink Asymmetry Analysis for UAV Links

- Visualized and analyzed the field measurements to provide physical evidence of uplink asymmetry.

- Investigated underlying fundamentals in LTE, 5G, and Wi-Fi

- Designed simulation frameworks to evaluate the impact of uplink asymmetry for UAV networks.

Deep Reinforcement Learning Framework for Adaptive Modulation and Coding Scheme

- Applied deep Q network (DQN), neural episodic control (NEC), and multi-agent framework to adaptive modulation and coding scheme.

WORK EXPERIENCE

Skydio Inc. **San Mateo, CA, USA**

Wireless Software and Systems Engineer Intern *May 2024 - August 2024*

- Designed and executed wireless link performance evaluations for UAV systems under uplink asymmetric environments, identifying scenarios with up to 40% throughput degradation.

- Investigated robustness and fundamentals of ACK/NACK feedback mechanisms in LTE, 5G, and Wi-Fi.

- Collaborated with cross-functional teams to model and generate LTE and Wi-Fi interference signals for controlled chamber testing, enabling targeted evaluation of UAV link performance under interference.

Daohm Research Lab. **Seoul, South Korea**

Research consultant *March 2022 - July 2022*

Nowon Career Center for Youth and Future **Seoul, South Korea**

Instructor: AI-based image recognition program *May 2021*

Instructor: Basic Python programming course *January 2022 - February 2022*

Communications and Artificial Intelligence Lab. **Seoul, South Korea**

Dept. of Electronic Convergence Engineering, Kwangwoon University *March 2021 - July 2022*

Researcher

Kwangwoon University **Seoul, South Korea**

Teaching assistant *March 2019 - June 2020*

Military Service: Republic of Korea Air Force (ROKAF) *April 2014 - April 2016*

Military Police: Law enforcement and entrance control

SELECTED PUBLICATIONS

1 **Donggu Lee**, *et al.*, "Analysis and prediction of coverage and channel rank for UAV networks in rural scenarios with foliage," *IEEE Open Journal of Vehicular Technology*, vol. 6, pp. 1943-1962, July 2025.

2. **Donggu Lee**, *et al.*, "Reliability of Wi-Fi, LTE, and 5G-based UAV RC links in ISM bands: Uplink interference asymmetry analysis and HARQ design," arXiv:2507.20392, July 2025.

3. **Donggu Lee**, *et al.*, "Multi-agent reinforcement learning-based resource allocation scheme for UAV-assisted internet of remote things systems," *IEEE Access*, vol. 11, pp. 53155-53164, May 2023.

MAJOR AWARDS AND HONORS

1. **IEEE Bronze Paper Award**: 2019 IEEE Student Paper Contest, Seoul, South Korea, Nov. 2019.

2. **Excellence Paper Award**: KICS Summer Conference 2022, Jeju-do, South Korea, June 2022.

3. **Summer Graduate Award**: College of Engineering, NC State University, NC, USA, Apr. 2023.

SERVICE & LEADERSHIP

IEEE Peer Reviewer (9 papers, IEEE Transactions, VTC, ICC, etc.): Reviewed research papers on UAV networks, machine learning-driven communications, and adaptive modulation.