Hanju Yoo

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SUMMARY

I am a Ph.D. student researching for **deep learning for communications** and **information theory for deep learning** at the Intelligence Networking Lab., Yonsei University, Korea. Before joining the lab, I earned a B.E. from the School of Integrated Technology at Yonsei University, graduating with the highest honors. My research interest includes semantic communications, learned image compression, and computer vision. I was an exhibitor at CES 2023 on behalf of Yonsei University, and am a recipient of the 2022 Qualcomm IT Tour Program. Committed to community engagement, I have served as a teaching assistant for three years and have two years of student council experience. I also love to solve real-world problems by creating automated, sustainable, and systematic solutions.

EDUCATION

2021 — Present **Yonsei University** Seoul, Korea
Ph.D. Student *(Advisor: Prof. Songkuk Kim and Prof. Chan-Byoung Chae)*

2018 — 2021 **Yonsei University** Seoul, Korea
B.E. Integrated Technology (GPA: 4.15/4.3, **Graduated with Highest Honors**)

PUBLICATIONS

1. J. Kwak*, **H. Yoo***, I. Roberts, and C.-B. Chae, "Site-Specific Beam Alignment without Explicit Channel Knowledge via Deep Learning," *Submitted*.
2. **H. Yoo**, D. Choi, S. Kim, and C.-B. Chae, "Symbol Distributions in Semantic Communications: An Information-Theoretic Perspective," *To be submitted*.
3. **H. Yoo**, D. Choi, Y. Kim, Y. Kim, S. Kim, and C.-B. Chae, "Bridging Neural Networks and Wireless Systems with MIMO-OFDM Semantic Communications," *To appear in IEEE Wireless Communications*.
4. Y. Kim, H.-J. Moon, **H. Yoo**, B.-N. Kim, K.-K. Wong, and C.-B. Chae, "A State-of-the Art Survey on Full Duplex Network Design," *Proc. IEEE*, pp. 1–24, Feb. 2024.
5. **H. Yoo**, L. Dai, S. Kim, and C.-B. Chae, "On the Role of CNN and ViT on Semantic Communications: Analysis and Prototype Validation," *IEEE Access*, vol. 11, pp. 71528-71541, July 2023.
6. **H. Yoo**, L. Dai, S. Kim, and C.-B. Chae, "Real-Time Semantic Communications with a Vision Transformer," *IEEE Int. Conf. Commun. Workshops (ICC WKSHPS)*, May 2022.

SYSTEM DEMONSTRATIONS

May 2025 Exhibitor, **IEEE 6G Summit 2025**
Demonstrated MIMO semantic communications prototype.

Jan. 2024 Exhibitor, **IEEE GLOBECOM 2024**
Demonstrated zooming-based semantic communications for entropy maximization.

Feb. 2023 Exhibitor, **IEEE CCNC 2023**
Demonstrated real-time wireless semantic communications testbed.

Feb. 2023 Exhibitor, **CES 2023**
Demonstrated real-time wireless semantic communications testbed in behalf of Yonsei college of engineering.

May 2022 Exhibitor, **IEEE ICC 2022**
Demonstrated world-first real-time wireless semantic communications testbed.

TALKS AND PRESENTATIONS

May 2025 Semantic Communications: From Theory to Prototypes, EURECOM

Oct. 2024 Site-Specific Beam Alignment without Explicit Channel Knowledge via Deep Learning, Asilomar Conference on Signals, Systems, and Computers

May 2022 Real-Time Semantic Communications with a Vision Transformer, IEEE ICC 2022 (podium speech)

AWARDS AND HONORS

Feb. 2025 2024 Exemplary Reviewer, **IEEE Wireless Communications Letters**

Feb. 2025 Honor Prize, **31st Samsung Humantech Paper Contest**
Paper title: Bridging Neural Network and Wireless Systems: Theory and Prototypes for Semantic Communications (Co-recipient: Dongha Choi)

Aug. 2022 Recipient, **Qualcomm IT Tour Program**
Participated in the Qualcomm IT Tour, a fully-funded program providing a visit of Qualcomm's San Diego headquarters with executive presentations and networking opportunities.

Feb. 2021 **Graduated with Highest Honors**
<1% in college of engineering, ranked 1st

Mar. 2018 **Full Scholarship for Undergraduate**
Issued by Ministry of Science and ICT of Korea (MSIP) and National IT Industry Promotion Agency (NIPA)

EXPERIENCES

Mar. 2021 — Dec. 2023 **Teaching Assistant**, Computationtal Thinking and SW Programming, Yonsei University
Led weekly 4-hour Python lectures and prepared course materials and exams.

PROJECTS

2025 **Phased Array System Development**
Developed a phased array transceiver using the ADI ADAR1000-EVALZ board, with beamforming implemented via SPI control on a Raspberry Pi platform. Responsible for system integration, low-level SPI programming, and over-the-air Tx/Rx beamforming experiments.

2024–2025 **Python-Based Soft Modem Development**
Designed and implemented a software-defined radio (SDR) modem for MIMO-OFDM, full-duplex, and Pixel-MIMO fluid antenna systems, using Python (numpy, UHD) from scratch. Features include timing and frequency synchronization, custom PHY design, and real-time over-the-air experiments.

2011 — 2018 **KBoost**
A Windows process cleaner with 50k+ downloads, featured in IT Donga software reviews[1].

SKILLS

- **Languages:** Korean (Native), English (Fluent, TEPS 521)
- **Foundational Expertise in EECS:** Communications Theory, Computer Networks, Operating Systems, Computer Architecture, Parallel/GPU Computing, Compiler Design, and Computational Theory
- **Programming:** Python, Matlab, Tensorflow, C/C++ (Fluent), Javascript, Ruby, CUDA, LabVIEW (Intermediate)

[1] https://it.donga.com/23713/