

SEUNGCHEOL OH

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EXPERIENCES

Visiting Researcher, Wireless Communication Systems Development, WiSE Lab *June 2023 - Present*

- Developing data driven, end-to-end solutions to time-dependent optimization problems in wireless communication systems with GRU, LSTM and Transformers
- Designing a robust framework to generate image data of basestation surroundings based on wireless channel information using GAN and LLM
- Developing computer vision applied solutions to facilitate hybrid massive MIMO-NOMA system with imperfect channel state information
- Formulating pilot transmission protocol for channel acquisition in polarization reconfigurable MIMO system
- Enhancing polarized antenna selection system via convex-optimization techniques

Graduate Researcher, WiSE Lab

May 2019 – Dec 2022

- Developed polarized antenna selection scheme to improve the error rate of the system to conventional system with 3 dB signal to noise ratio (SNR) gain for 10^{-3} error rate (coop project with Prof. Andreas Molisch) [2]
- Proposed multi-polarized superposition beamforming to effectively allocate power and subcarriers across two orthogonal polarizations to achieve significant signal to noise ratio gain [1, 4]
- Designed experiments for polarization reconfigurable NOMA with Dynamic ordered SIC

Undergraduate Researcher, WiSE Lab

Jan 2018 - May 2019

- Experimented polarized-MIMO (P-MIMO) system under different channel models to verify the practicality of the system [5]
- Prototyped analog beamforming in MIMO communication system with universal software radio peripheral (USRP) device with real-time wireless channel

First Place Award for Senior Capstone Design Competition

PUBLICATIONS

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- [1] **Oh, Paul** and Sean Kwon. Multipolarization superposition beamforming: Novel scheme of transmit power allocation and subcarrier assignment. *IEEE Transactions on Wireless Communications*, 22, 2023.
 - [2] **Paul S. Oh**, Sean Soek-Chul Kwon, and Andreas F. Molisch. Antenna selection in polarization reconfigurable MIMO (PR-MIMO) communication systems. *arXiv*, 2021.
 - [3] Junghyun Kim, Thong D. Ngo, **Oh, Paul S.**, Sean S.-C. Kwon, Changhee Han, and Joongheon Kim. Economic theoretic leo satellite coverage control: An auction-based framework. In *2020 International Conference on Information and Communication Technology Convergence (ICTC)*, pages 258–260, 2020.
 - [4] **Oh, Paul** and Sean Kwon. Multi-polarization superposition beamforming with xpd-aware transmit power allocation. In *2020 IEEE 92nd Vehicular Technology Conference (VTC2020-Fall)*, 2020.
 - [5] **Oh, Seungcheol Paul** and Seok-Chul Sean Kwon. Capacity of polarized-mimo (p-mimo) system in different wireless channels. In *2018 IEEE Green Energy and Smart Systems Conference (IGESSC)*, 2018.
- 2018 IGESSC Best Paper Award.**

INVITED TALKS

EE 488: Communication Capstone Design Class, *Visiting Lecturer*

- Held tutorial for machine learning applied optimization problems in wireless communication *Spring 2024*
- Held tutorial on LabVIEW to operate USRPs to design beamforming systems *Fall 2019*

EDUCATION

California State University Long Beach

Long Beach, CA, USA

Master of Science in Electrical Engineering

May. 2022

Advisors: Seok Chul Kwon

Thesis: [Enhancement of Multiple Input Multiple Output \(MIMO\) Communication System with Polarization](#)

Graduated with graduate Dean's List of University Scholars and Artists

California State University Long Beach

Long Beach, CA, USA

BAS.c. in Electrical Engineering

Dec. 2019

Graduated on a Dean's Honour List, Magna Cum Laude and Distinction