Seoyul Oh

Ph.D. Candidate at the University of Illinois Urbana-Champaign (UIUC)

 Thomas M. Siebel Center for Computer Science, 201 North Goodwin Avenue, Urbana, IL 61801

 seoyuloh.github.io   seoyulo2@illinois.edu   in/seoyul-oh   @seoyuloh_012   Google Scholar

Interests

My research focuses on advancing the efficiency, reliability, and safety of networked systems through the application of game-theoretic models and practical machine learning techniques.

Education

University of Illinois Urbana-Champaign, *IL, USA*   Sep 2023 - Current
Doctor of Philosophy, Computer Science
Advisors: Prof. Francis Y. Yan & Prof. Deepak Vasisht

Korea University, *Seoul, Korea*   Feb 2023
Master of Science, Electrical and Computer Engineering
Advisor: Prof. Sangheon Pack

Korea University, *Seoul, Korea*   Feb 2021
Bachelor of Science, Electrical Engineering

Publications

[1] **A Call for Decentralized Satellite Networks** 📄
Seoyul Oh, Deepak Vasisht
ACM Workshop on Hot Topics in Networks   HotNets 2024

[2] **A First-Principles Diagnosis of RL Training in Networked Systems** 📄
Seoyul Oh[*], Yikai Zheng[*], Deepak Vasisht, Francis Y. Yan
Under Review, [*]Equal contribution   Under Review

[3] **OrbitShare: A Multi-party Architecture for Decentralized LEO Satellite Networks** 📄
Seoyul Oh, Bill Tao, Shreya Kannan, Deepak Vasisht
Under Review   Under Review

[4] **EcoCell: Energy-aware Traffic Shaping for Cellular Radio Access Networks** Poster version 📄
Zikun Liu, Seoyul Oh, Bill Tao, Anuj Kalia, Yaxiong Xie, Deepak Vasisht
Under Review   Under Review

[5] **An Efficient Winner and Payment Determination Algorithm in Reverse Auction for Edge Federation** 📄
Taeyun Kim, Joonwoo Kim, Hochan Lee, Seoyul Oh, Sangheon Pack
IEEE Transactions on Network and Service Management   IEEE TNSM

[6] **(Poster) BACKWARD: A Victim-Centric DDoS Detection and Mitigation Scheme in Programmable Data Plane** 📄
Seoyul Oh, Sol Han, Hochan Lee, Sangheon Pack
IEEE Consumer Communications & Networking Conference   CCNC 2023

[7] **Holistic Orchestration for Edge-Native Applications: A Review** 📄
Taeyun Kim, Seoyul Oh, Inho Cha, Seunghyun Lee, Haneul Ko, Sangheon Pack
IEEE International Conference on Information and Communication Technology Convergence   ICTC 2022

Research Experience

Illinois Networked Systems and AI (INSAI) Lab, University of Illinois Urbana-Champaign *IL, USA* Jan 2025 - Current
Research Assistant
Project: First-Principles RL for Networking
- Designed a first-principles diagnostic framework to visualize and analyze RL training dynamics, identify key failure modes, and provide practical guidelines for reliably learning high-performance adaptive bitrate streaming policies [2]

Wonderful Wireless Lab, University of Illinois Urbana-Champaign *IL, USA* Sep 2023 - Current
Research Assistant
Project: Decentralized Satellite Networking
- Proposed MP-LEO, a decentralized satellite network where participants share spare satellite capacity ensuring robust coverage without needing independent large constellations [1] [3]
Project: Energy-Aware Cellular Networking
- Developed EcoCell, a software-only middlebox solution that reduces base station energy consumption through traffic shaping techniques like subframe packing, UE segregation, and temporal traffic shifting [4]
- Validated EcoCell across applications, achieving energy savings with minimal impact on user experience

Mobile System, Security and Networking Lab, Purdue University *West Lafayette, IN, USA* Aug 2022 - Feb 2023
Visiting Graduate Researcher (Advisor: Prof. Chunyi Peng)
Project: Better Mobility Support in 5G Cellular Networks
- Proposed a low-latency video delivery scheme for 5G cellular-connected drones
- Measured 5G performance in the sky through real-world experiments

Mobile Network and Communications Lab, Korea University *Seoul, South Korea* Mar 2021 - Jul 2022
Research Assistant
Project: Network Security Utilizing Programmable Data Planes
- Led research on a P4-based victim centric DDoS detection and mitigation scheme [6]
Project: Development of an Open-source-based Edge Cloud Service Platform Prototype
- Analyzed future edge cloud service platform requirements
- Proposed a framework that performs holistic orchestration in edge cloud environments [5] [7]

Honors and Awards

Korean Honor Scholarship (KHS) *Ministry of Foreign Affairs (MOFA), Korea* Fall 2025

KASF-KIA Scholarship *Korean American Scholarship Foundation* Fall 2025

International R&D Program Grant for Graduate Students in Science & Technology *Ministry of Science and ICT, Korea*
(12,580 USD) Jun 2022 - Feb 2023

Merit-based Scholarship *School of Electrical Engineering, Korea University* Spring 2020

Semester High Honors *School of Electrical Engineering, Korea University* 2020, 2019, 2017

Teaching Experience

CS538: Advanced Computer Networks University of Illinois, Urbana-Champaign Spring, Fall 2025
Teaching Assistant (Instructor: Francis Y. Yan)

EGRN322: Technology Trends for Establishing and Managing Business Korea University Fall 2021
Teaching Assistant (Instructor: Sangheon Pack)

KECE370: Digital Signal Processing, Korea University Korea University Fall 2021
Korea University Center for Teaching and Learning (KUCTL) Tutor
Best Tutor Award & Best Team Award

References
- Prof. Francis Y. Yan .... *Assistant Professor in Computer Science at UIUC* [◉]
- Prof. Deepak Vasisht .... *Assistant Professor in Computer Science at UIUC* [◉]
- Prof. Chunyi Peng .... *Associate Professor in Computer Science at Purdue University* [◉]
- Prof. Sangheon Pack .... *Professor in Electrical Engineering at Korea University* [◉]