2025년도 한국통신학회 동계종합학술발표회 특별프로그램 ❄

글로벌 인더스트리 인사이트

일시 2025년 2월 6일(목) 14:00~16:30
장소 용평리조트 타워콘도 1층 크리스탈

프로그램 ❄

| 시간	발표주제	발표자(소속)
		좌장: 정민채 교수(세종대)
14:00~14:35	Extending mmWave Deployment in the Next-Generation Network	Dr. Hyukjin Chae (Apple, USA)
14:35~15:10	Running Large-scale Data Center Networks at Meta	Dr. Sangki Yun (Meta, USA)
		좌장: 임병주 교수(부경대)
15:20~15:55	AI/ML for 5G/6G Air Interface	Dr. Taesang Yoo (Qualcomm, USA)
15:55~16:30	Road to 6G, A Mobile Ecosystem Perspective	Dr. Insoo Hwang (Google, USA)

강연 소개 ❄
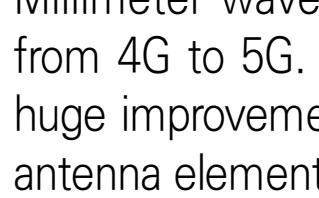
Extending mmWave Deployment in the Next-Generation Network

Dr. Hyukjin Chae

Apple, USA

- 2022~present, Wireless System Engineer, Apple, CA, USA
- 2019~2022, Senior Research Scientist, Ofinno, VA, USA
- 2012~2019, Professional Research Engineer, LG Electronics
- 2012, PhD in EE, Yonsei University

Millimeter wave (mmWave) communication has been proposed as an enabling technology for the evolution from 4G to 5G. Using the enormous bandwidth between 24.25 GHz ~71.0 GHz, this technology allows for a huge improvement of channel capacity compared to sub-6 GHz bands. In addition, the smaller size of individual antenna elements also supports the integration of larger antenna arrays for beamforming and spatial multiplexing. 3GPP has therefore supported this technology and defined corresponding technical specifications for Frequency Range 2 (FR2) bands in 5G NR. Although mmWave communication has shown significant potential in research, its commercial deployment has not thrived as expected. Major deployment only happens in US and Japan, while in other regions (China, Europe, South Korea, etc.) the deployment is generally limited. Besides, the coverage can be almost non-existent in many urban areas even in those countries that deploy mmWave cells.
The difficulty commercializing 5G mmWave results from inherent challenges, which need solutions to fully unleash its bene fits. In this presentation, we discuss five major challenges, and elaborate on three enabling technologies for coverage and reliability enhancement that can be the current focus.

Running Large-scale Data Center Networks at Meta

Dr. Sangki Yun

Meta, USA

- 2020~present, Software Engineer, Meta, CA, USA
- 2019~2020, Software Engineer, Amazon, CA, USA
- 2016~2019, Research Engineer, HP Labs, CA, USA
- 2016, PhD in CS, UTAustin

Over the last 10 years, the number of Meta service users has grown from 500 million to 3.5 billion users. To accommodate a huge number of users, building a scalable data center network is crucial. This talk introduces how Meta datacenter networks have been scaled up. First, I introduce how the datacenter network architecture has been evolved to achieve high capacity, resilience, and reliability. Second, I present how the data center network is managed, mainly focusing on the network routing perspective. It will introduce why BGP is used as the main routing protocol, how BGP successfully handles scalability and reliability issues of routing, and how we overcome the limitation of BGP with Intent Based Networking and Routing Policy Verification.

AI/ML for 5G/6G Air Interface

Dr. Taesang Yoo

Qualcomm, USA

- 2007~present, Senior Director, Qualcomm, CA, USA
- 2007, PhD in EE, Stanford University
- 1998, BS in EE, Seoul National University

AI/ML is poised to significantly influence the future of 6G technology. Their integration into the Radio Access Network (RAN) and devices is expected to enhance spectral efficiency, coverage, and energy efficiency. Innovations such as AI-native air interface and AI-driven RAN Digital Twin modeling are already impacting 5G systems and laying the groundwork for 6G. In this presentation, we will explore the role of AI/ML in the evolution of 5G and 6G Air Interface Standards. We will present AI/ML use cases currently being studied or specified in 5G-Advanced 3GPP Air Interface Standards, including channel state feedback, channel prediction, beam prediction, precise positioning, and mobility enhancement, as well as general frameworks for one-sided and two-sided models. Additionally, we will discuss the opportunities AI/ML presents for the 6G Air Interface and highlight select use cases.
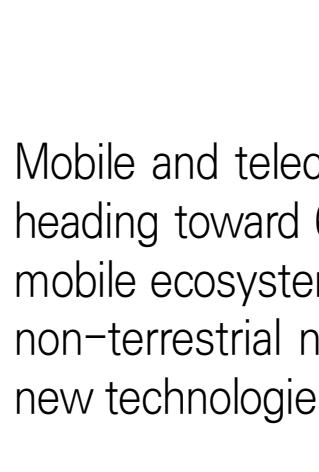
Road to 6G, A Mobile Ecosystem Perspective

Dr. Insoo Hwang

Google, USA

- 2021~present, Senior Engineering Manager, Google, USA
- 2020~2021, Lead Architect, Facebook, CA, USA
- 2015~2020, Wireless System Architect, Google, CA, USA
- 2012~2015, Staff System Engineer, Qualcomm, CA, USA
- 2010~2012, Staff Systems Engineer, Samsung Research America, CA, USA
- 2005~2007, MTS, Samsung Advanced Institute of Technology
- 2013, PhD in ECE, UTAustin

Mobile and telecommunication industries have been working toward 5G for the past decade, and now they are heading toward 6G. In this talk, we will first review the past decade's journey on cellular communication from a mobile ecosystem perspective. We will then explore new technologies that may go along with 6G, which include non-terrestrial networks, on-device AI/ML, mobile HW/SW platforms and more. We then discuss how those new technologies would intersect with mobile devices and ecosystems in the 6G era.