해외석학 초청강연

일시 2024년 2월 1일(목) 08:30~09:40, 14:00~15:10   **장소** 용평리조트 타워콘도 1층 크리스탈

◎ 프로그램

시간	발표주제	발표자(소속)
08:30~09:40	Turning the 6G Air Interface into an AI Computer	Prof. Kaibin Huang (The University of Hong Kong)
14:00~15:10	Fluid Antenna Systems for 6G	Prof. Kai-Kit Wong (UCL, UK)

◎ 강연 소개

Turning the 6G Air Interface into an AI Computer

Prof. Kaibin Huang, The University of Hong Kong
IEEE Fellow, Highly Cited Researcher

Kaibin Huang received the B.Eng. and M.Eng. degrees from the National University of Singapore and the Ph.D. degree from The University of Texas at Austin, all in electrical engineering. He is a Professor and an Associate Head at the Dept. of Electrical and Electronic Engineering, The University of Hong Kong, Hong Kong. He received the IEEE Communication Society's 2021 Best Survey Paper, 2019 Best Tutorial Paper, 2019 Asia-Pacific Outstanding Paper, 2015 Asia-Pacific Best Paper Award, and the best paper awards at IEEE GLOBECOM 2006 and IEEE/CIC ICCC 2018. He received the Outstanding Teaching Award from Yonsei University, South Korea, in 2011. He has been named as a Highly Cited Researcher by the Clarivate Analytics in 2019-2022. He is a member of the Engineering Panel of Hong Kong Research Grants Council (RGC) and a RGC Research Fellow. He served as the Lead Chair for the Wireless Communications Symposium of IEEE Globecom 2017 and the Communication Theory Symposium of IEEE GLOBECOM 2023 and 2014, and the TPC Co-chair for IEEE PIMRC 2017 and IEEE CTW 2023 and 2013. He is also an Executive Editor of IEEE Transactions on Wireless Communications, and an Area Editor for both IEEE Transactions on Machine Learning in Communications and Networking and IEEE Transactions on Green Communications and Networking. Previously, he served on the Editorial Boards for IEEE Journal on Selected Areas in Communications and IEEE Wireless Communication Letters. He has guest edited special issues of IEEE Journal on Selected Areas in Communications, IEEE Journal of Selected Areas in Signal Processing, and IEEE Communications Magazine. He is a Fellow of IEEE and was also a Distinguished Lecturer of the IEEE Communications Society and the IEEE Vehicular Technology Society.

6G will feature edge intelligence referring to ubiquitous deployment of AI algorithms at the network edge. One key operations is the use of distributed learning algorithms to distill AI from an enormous amount of mobile data distributed at the edge. The other operation is to use the distilled intelligence to automate IoT applications ranging from autonomous driving to virtual reality. Such data-intensive operations create a wireless communication bottleneck. This problem is rooted in the traditional rate-centric philosophy of treating the Air as "bit pipes". Aligned with the 6G paradigm shift towards task-oriented designs, I will introduce a new class of techniques called Over-the-Air Computing (AirComp). Their ambitious goal transcends overcoming the communication bottleneck to aim at turning the 6G Air Interface into an AI computer. In this talk, I will introduce the history and principle of AirComp that exploits channel waveform superposition to realize a desired computing function such as averaging and maximization. Then latest advancements in the field will be introduced including over-the-air federated learning, distributed optimization, and distributed sensing. I will conclude by describing a vision of 6G intelligence network becoming a gigantic computer integrating computing on devices, at servers, and in the air.

Fluid Antenna Systems for 6G

Prof. Kai-Kit Wong (UCL, UK)

(Kit) Kai-Kit Wong received the BEng, the MPhil, and the PhD degrees, all in Electrical and Electronic Engineering, from the Hong Kong University of Science and Technology, Hong Kong, in 1996, 1998, and 2001, respectively. He is Chair Professor of Wireless Communications at the Department of Electronic and Electrical Engineering, University College London. His current research centers around 6G mobile communications. He is one of the early researchers who proposed multiuser MIMO. His first paper on multiuser MIMO was published in WCNC 2000 which appeared to be the first ever research paper on this topic. He is the inventor of the concept known as Fluid Antenna System (FAS). He is Fellow of IEEE and IET. He served as the Editor-in-Chief for IEEE Wireless Communications Letters between 2020 and 2023.

Fluid antenna system (FAS) is an emerging concept that represents software-controlled position-flexible shape-flexible antenna for new degree of freedom in the physical layer of wireless communications. Recent research has reported great potential of FAS in single and multiuser communications. In this short tutorial, we will cover the basics of FAS and help researchers see how FAS can be integrated into their own research. The tutorial will also provide a brief update on the latest results in FAS.

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