

BT-1

Post-Shannon時代の電磁気情報理論及び セマンティック通信

Electromagnetic Information and Semantics Communication
toward Post-Shannon Era

日時：2023年9月13日（水）09:30～11:45

開催：名古屋大学（東山キャンパス） A21 室

B5G/6Gに向け、世界各国において、ポストシャノンと呼ばれる理論検討が行われている。本チュートリアル講演では、その代表的な例として、電磁気情報理論及びセマンティック通信について世界的な有力者による講演を行う。電磁気情報理論編では、既存のシャノン理論にマクスウェルの電磁気方程式を加えることで、より正確な通信容量を計算する仕組みについて講演を行う。セマンティック通信では、ビットでなく送りたい情報に含まれているセマンティック情報を伝送する新たな通信のコンセプトについて講演を行う。これらの講演により、関連知識の取得とともにポストシャノン時代における新たな通信のあり方を考えてみる良い機会となると期待される。

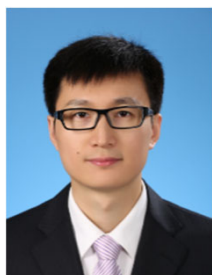
Towards B5G/6G, theoretical studies called post-Shannon are being actively conducted. In this tutorial, as representative examples, tutorial lectures by a world-renowned person on electromagnetic information theory and semantics communication will be given. In the electromagnetic information theory field, this tutorial will explain on the mechanism and principle for obtaining more accurate channel capacity by adding Maxwell's electromagnetic equations to the existing Shannon theory. In semantics communication field, this tutorial will give a lecture on a new concept of communication that transmits semantic information contained in the information instead of transmitting bits. These lectures are expected to provide a good opportunity to acquire related knowledge and to think about new ways of communication in the post-Shannon era.

講演者紹介



Prof. Chan-Byoung Chae, Yonsei University, Korea

Chan-Byoung Chae (IEEE Fellow) is an Underwood Distinguished Professor in the School of Integrated Technology, College of Computing, Yonsei University, Korea. He was with the Department of Electrical Engineering, Stanford University, CA, USA as a Visiting Professor in 2017. He was a Member of Technical Staff (Research Scientist) at Bell Laboratories, Alcatel-Lucent, Murray Hill, NJ, USA from June 2009 to Feb 2011. Before joining Bell Laboratories, he was with the School of Engineering and Applied Sciences at Harvard University, Cambridge, MA, USA as a Post-Doctoral Research Fellow/Lecturer. He received the Ph.D. degree in Electrical and Computer Engineering from The University of Texas (UT), Austin, TX, USA in 2008., where he was a member of the Wireless Networking and Communications Group (WNCG). Prior to joining UT, he was a Research Engineer at the Advanced Research Lab., the Telecommunications R&D Center, Samsung Electronics, Suwon, Korea, from 2001 to 2005. He was an Editor-in-Chief of IEEE T-MBMC and is now an IEEE Distinguished Lecturer. Prof. Chae was the recipient of IEEE Sig. Proc. Mag. Best Paper Award, IEEE/KICS Jour. Comm. Nets Best Paper Award, four best demo awards from IEEE ICC, IEEE INFOCOM, IEEE DySPAN, IEEE WCNC. His current research interests include wireless mobile networks and nano (molecular) communications.



Prof. Linglong Dai, Tsinghua University, China

Linglong Dai (M'11-SM'14-F'22) received the B.S. degree from Zhejiang University in 2003, the M.S. degree (with the highest honor) from the China Academy of Telecommunications Technology (CATT) in 2006, and the Ph.D. degree (with the highest honor) from Tsinghua University, Beijing, China, in 2011. From 2011 to 2013, he was a Postdoctoral Research Fellow with the Department of Electronic Engineering, Tsinghua University, where he has been an Assistant Professor from 2013 to 2016, an Associate Professor from 2016 to 2022, and a Professor since 2022. His research area is transmission theory and technology for wireless communications, with the research topics including massive MIMO, reconfigurable intelligent surface (RIS), millimeter-wave and terahertz communications, machine learning for wireless communications, and electromagnetic information theory (EIT). Dr. Dai has received 5 IEEE conference Best Paper Awards. He has also received the Electronics Letters Best Paper Award in 2016, the IEEE Communications Letters Exemplary Editor Award in 2017, the National Natural Science Foundation of China for Outstanding Young Scholars in 2017, the IEEE ComSoc Asia-Pacific Outstanding Young Researcher Award in 2017, the 7th IEEE ComSoc Asia-Pacific Outstanding Paper Award in 2018, the China Communications Best Paper Award in 2019, the IEEE Access Best Multimedia Award in 2020, the China Communications Best Editor Award in 2020 and 2021, the IEEE ComSoc Leonard G. Abraham Prize in 2020, the IEEE ComSoc Stephen O. Rice Prize in 2022, and the IEEE ICC Outstanding Demo Award in 2022. He was listed as a Highly Cited Researcher by Clarivate from 2020 to 2022.