

6G: Beyond Communications Capabilities, Enabling Technologies, and Emerging Vertical Applications

Abstract:

The massive deployment of the fifth generation (5G) wireless networks are significantly accelerating the ongoing process of industrial and societal transformation. Disregard many impressive achievements, current scenario-specific, and communication-centric 5G technologies still face many challenges in empowering future applications with diverse requirements. The fundamental design consideration of the sixth generation (6G) networks is how to identify and meet its application-specific operational goals with beyond communications capabilities and constrained resources.

The focus of this presentation is to analyze the technical challenges of 6G, identify the essential key enabling technologies, and present the related ongoing research activities and future development directions. Different perspectives of the 6G networks, including the 6G operational goals, key performance indicators (KPIs), and emerging technologies, are analyzed and presented. Our recent research activities on 6G including multi-dimensional multiple access, network synchronization, integrated sensing and communication as well as value-oriented operations will be presented.

Biography:

Xianbin Wang (Fellow, IEEE) received his Ph.D. degree in electrical and computer engineering from the National University of Singapore in 2001.

He is a Professor and a Tier-1 Canada Research Chair in 5G and Wireless IoT Communications with Western University, Canada. Prior to joining Western University, he was with the Communications Research Centre Canada as a Research Scientist/Senior Research Scientist from 2002 to 2007. From 2001 to 2002, he was a System Designer at STMicroelectronics. His current research interests include 5G/6G technologies, Internet of Things, machine learning, communications security, and intelligent communications. He has over 600 highly cited journals and conference papers, in addition to over 30 granted and pending patents and several standard contributions.

Dr. Wang is a Fellow of the Canadian Academy of Engineering and a Fellow of the Engineering Institute of Canada. He has received many prestigious awards and recognitions, including the IEEE Canada R. A. Fessenden Award, Canada Research Chair, Engineering Research Excellence Award at Western University, Canadian Federal Government Public Service Award, Ontario Early Researcher Award, and nine Best Paper Awards. He was involved in many IEEE conferences, including GLOBECOM, ICC, VTC, PIMRC, WCNC, CCECE, and CWIT, in different roles, such as General Chair, TPC Chair, Symposium Chair, Tutorial Instructor, Track Chair, Session Chair, and Keynote Speaker. He serves/has served as the Editor-in-Chief, Associate Editor-in-Chief, and editor/associate editor for over ten journals. He was the Chair of the IEEE ComSoc Signal Processing and Computing for Communications (SPCC) Technical Committee and is currently serving as the Central Area Chair of IEEE Canada.