Special Issue on:

6G Technologies, Applications, and Challenges.

Scope:

The initial deployment of 5G networks have demonstrated that, the new generation of wireless networks does not just bring an incremental update on the previous 4G networks, but a paradigm shift that enables the exploitation of the much wider mmWave frequency spectrum, with an extreme densification on the number of antennas and devices. This has come as a result of the extensive research on developing novel approaches for enhanced wireless networks, where it was agreed that 5G is aimed to be designed on three main paradigms, including enhanced mobile broadband (eMBB), ultra-reliable low latency communications (URLLC), and massive machine type communications (mMTC). As a consequence, 5G networks are envisioned to deliver Gpbs data rates, sub-*ms* latency, and 1 million device/km^2 connectivity, to name a few. A swarm of novel technologies, including massive Multiple-Input Multiple-Output (mMIMO), mmWave communication, network function virtualization, as well as the integration of machine learning as a network orchestrator, were proposed as a solution to achieve the earlier mentioned network key performance indicators. While these advancements have introduced a noticeable enhancement in the performance of current wireless networks and have successfully enabled a range of use-cases, we anticipate that 5G networks will fail to meet the ever-growing demands of rapidly evolving wireless networks. In specific, beyond 5G networks are anticipated to be oriented towards integrating technologies in all life aspects, including healthcare, education, transportation, manufacturing, retail, etc. Accordingly, current network architectures and technologies need to be revisited in order to ensure their applicability to deliver the required quality-of-service, extremely high data rates, ultra-low latency, and high energy and spectral efficiency. While it is yet to be explored what 6G will be, it is not difficult to tell that it is envisioned to offer extremely immersive experiences, haptics, industry 4.0 with connected intelligence, 3D full coverage, and native artificial intelligence (AI)-empowered wireless communication.

The aim of this special issue is to solicit research papers with original contributions that address the latest advances and challenges in 6G wireless networks, paving the way for the efficient design and implementation of future wireless networks. More specifically, this special issue will bring together leading researchers from both industry and academia to present their views on the emerging research with respect to the fundamentals, core design aspects, applications, use-cases, and challenges of 6G networks.

Topics:

The topics of interests include, but are not limited to:

- Non-terrestrial wireless Networks.
- Satellite-aerial-ground-underwater Integrated networks.
- Advancements in vehicular networks.
- Recent development in reconfigurable intelligent surfaces.

- Advancements in MIMO/massive MIMO networks.
- Internet-of-everything (IoE) and Internet-of-Intelligence networks for smart city applications.
- Internet-of-BioNano-thing for healthcare applications.
- Optical wireless communication and VLC-enabled 6G.
- Underwater wireless sensor networks.
- Wireless underground sensor networks (WUSN).
- Advancements in integrated sensing and communications
- Novel air interface and waveform design.
- Novel AI architectures and machine learning algorithms.
- Advanced solutions for improved terahertz (THz) and mmWave communication.
- VR/AR/XR and haptic communication.
- Tactile internet.
- Security and privacy in 6G networks.
- Network slicing and cloud/fog/edge computing for network management.
- Zero-touch networks.
- Advancements in ultra-reliable low-latency communication (URLLC).
- Testbed designs and implementation of 6G networks.

Important Dates:

Manuscript submission: March 1, 2023
First review notification: May 15, 2023
Revised manuscript due: June 15, 2023
Final editorial decision: June 30, 2023
Final manuscript due: July 10, 2023
Publication date: 4rd Quarter 2023

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