The *ITU Journal on Future and Evolving Technologies (ITU J-FET)* is an international journal providing complete coverage of all communications and networking paradigms, free of charge for both readers and authors. The ITU Journal considers yet-to-be-published papers addressing fundamental and applied research. It shares new techniques and concepts, analyses and tutorials, and learnings from experiments and physical and simulated testbeds. It also discusses the implications of the latest research results for policy and regulation, legal frameworks, and the economy and society. This publication builds bridges between disciplines, connects theory with application, and stimulates international dialogue. Its interdisciplinary approach reflects ITU's comprehensive field of interest and explores the convergence of ICT with other disciplines. The ITU Journal welcomes submissions at any time, on any topic within its scope.

Special issue on

Towards vehicular networks in the 6G era

Call for papers

The continued growth in world population, longstanding trends in urbanization, and the need for continuous connection of individuals are driving the adoption of modern "always-on" mobile and connected services. Concurrently, transportation networks are increasingly essential to sustain vitality on all levels, including personal, social, economic, and political. Critical metrics for transportation include energy efficiency, safety, throughput, and transit time. Future implementation of 5G networks and emerging 6G networks will be challenged to meet the combined needs of this transportation/mobility/vehicular context and that of personal mobility and connectivity.

Novel technological scenarios are arising in the field of future lend mobile networks. Aiming to satisfy very challenging requirements, such as ultra-high reliable and ultra-low latency communications, as well as high efficiency and low-energy impacting, vehicular networks are playing a relevant role in what would be 6G scenarios. Traditional vehicular ad-hoc networks, where nodes communicate to each other following an opportunistic model, are now appearing as enhanced networks, with evolved nodes able to perform computational and control tasks, develop self-organizing and self-sustaining capabilities, as well as maintain connectivity availability.

In support of this transition, emerging communication paradigms can be adopted to make data transmission effective in very high dynamic contexts, including the re-programmability of the environment and the transmission conditions by means of Reprogrammable Intelligent Metasurfaces (RIMs). Also, Optical Wireless Communications (OWC) are envisioned as one of the main enabling technologies that guarantee a high data rate with a low-energy impact. Specifically, Visible Light Communications (VLC) represent a promising technology for high data rate vehicle-to-vehicle and vehicle-to-infrastructure links. Novel frameworks based on Software Defined Networking (SDN) and Network Function Virtualization (NFV) are expected to bring programmability, flexibility and scalability in vehicular networks, simplify network management and promote connectivity switching

and programmable metasurfaces. They are also supported by revolutionary networking models, such as Information Centric Networking (ICN) that provide distributed caching and computing services, and Social-based Networking, able to enhance network performance through social network analysis. Finally, solutions based on heterogeneous ground and aerial devices are expected to address connectivity issues, while guaranteeing high performance.

This special issue seeks novel contributions dealing with rising communication and networking technologies for vehicular networks, in a holistic fashion or at different layers, to meet the high expectations of the 6G era.

Suggested topics (but not limited to):

Vehicular networking in 6G scenarios
- Software-defined vehicular networks
- Vehicular cloud computing in the 6G era
- Fog/edge computing architectures for connected vehicles
- SDN/NFV/ICN based solutions for vehicular networks
- Mobile sensing networking, sensor data collection and multi-modal fusion
- Social networking for vehicular communications

Vehicular communications in 6G scenarios
- Caching strategies for connected vehicles
- Connectivity control and maintenance
- AI-based protocols for vehicular communications
- Novel frameworks for vehicular communications
- Non-Orthogonal Multiple Access (NOMA) for vehicle-to-everything communications

Vehicular sensing and positioning services in 6G scenarios
- Positioning techniques in vehicular networks for harsh environments
- Sensing techniques in vehicular networks for 6G scenarios

Technologies for vehicular communications
- Optical wireless technologies for 6G vehicular applications and services
- Reprogrammable and Intelligent Metasurfaces (RIMs) for smart connected vehicles
- Unmanned Aerial Vehicle (UAV)-assisted vehicular communications
- Hybrid wireless technologies for ubiquitous services and coexisting use cases (vehicular and non-vehicular)

Additional information
Please visit the ITU Journal website at https://www.itu.int/en/journal/j-fet/Pages/default.aspx. Inquiries should be addressed to Alessia Magliarditi at journal@itu.int.

Keywords

Vehicular communications and networking, 5G, 6G, next generation networks

Deadlines extended

Paper submission: 1 March 2022
Paper acceptance notification: 2 May 2022
Camera-ready paper submission: 2 June 2022

Paper submission

This special issue calls for original scientific papers. Submitted papers should not be under consideration for publication elsewhere. Submissions must be made electronically using EDAS: Editor's Assistant at https://edas.info/N28687. Templates and guidelines can be found at https://www.itu.int/en/journal/j-fet/Pages/submission-guidelines.aspx.

Publication

As soon as they get accepted, papers will be continuously published on the ITU digital library. They will then be bundled into the special issue digital publication.