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Scaling the Peaks of Global Communications

Call for Papers
Optical Networks & Systems Symposium

Symposium Co-Chairs

- **Luca Valcarenghi, Scuola Superiore Sant'Anna, Pisa, Italy – luca.vacarenghi@santannapisa.it**
- **Lutz Lampe, University of British Columbia, Vancouver, BC, Canada- lampe@ece.ubc.ca**

Scope and Motivation

Within the next decade, we will enter a new era in which hundreds of billions of things, connected vehicles, robots, drones, and humans will generate Zettabytes of digital information. All this vast information needs to be transported, stored, and processed in an efficient way. While today's Internet is built on a best-effort traffic paradigm, an increasing number of applications require reliable end-to-end transmission with guaranteed and deterministic throughput and bounded latency. For lower latency, data will be stored closer to the users, hence metropolitan and edge optical networks will grow considerably faster than long-haul fiber networks. Moreover, this hyperconnected world will not only increase the dependence on the network infrastructure but also expand the threat surface. Therefore, it is getting more important to better safeguard our network infrastructure against data leakage and unexpected service outages. Smart optical connectivity will be the foundation of this new digital world with highly desired features including high resilience, intrinsic security, scalability, upgradability, and environmental friendliness. Such programmable network infrastructure will be the nervous system that the digital society, industry, and economy will heavily rely upon. Delivering the required end-to-end performance while satisfying cost, energy and technology constraints of this network infrastructure presents a formidable research challenge. Optical network automation, dimensioning, interoperability, are key to achieve operators' business goals and supporting new complex services. Such complex networks are likely to be managed and controlled through AI/ML and data driven approaches where the network react to changes (e.g., failures, traffic pattern changes) with minimal human intervention (i.e., zero-touch) by exploiting also network digital twins. Moreover, the expected traffic growth and the tight latency constraints dictated by new 6G services will also require a substantial evolution not only of the legacy radio-access networks but also of the architecture and the technology of the underlying mobile transport and access networks. Optics and electrooptical systems will be enablers for not only mobile 6G speeds but also novel optical interconnect technologies for future advanced antenna systems impacting transport and access network architectures. Integration of free-space optical communication technologies to the emerging 6G wireless networks in various indoor (e.g., data centers), terrestrial (e.g., mobile networks), space (e.g., inter-satellite, ground-to-satellite and deep space communication), and underwater settings (e.g., underwater sensing) will be a crucial challenge. Finally, photonic integrated circuits carry the promise of significant reduction of size, weight, manufacturing costs, and power consumption while improving reliability. They can be used for several applications, such as photonic neural networks, high-speed fiber-based optical communications, next-generation low-cost environmental mapping systems, and lab-on-chip biosensors for fast and accurate analysis of biological samples. The Optical Networks and Systems Symposium aims to bring together researchers, practitioners, and technologists in this exciting era for the network infrastructure of the future hyperconnected world. As Colorado is a national hub for the Cable, Space, and Satellite Communication Industries, submissions on topics of interest to these industries are especially encouraged.

Topics of Interest

The Optical Networks and Systems Symposium intends to showcase the latest developments in all research areas related to optical networks and systems. The Symposium cordially invites original contributions, with a minimum length of three pages, in, but not limited to, the following topical areas and others not explicitly listed but are closely related:

- Optical wireless and fiber systems & networks for 5G and 6G
- Virtualization and slicing in optical networks
- Artificial intelligence and machine learning for optical systems and networks
- Optical access systems & networks in support of cost-effective edge compute deployment
- Systems & networks for open and disaggregated optical transport
- Experimental data-driven optical networking
- Data analytics for optical networks
- Software-defined optical networks including programmability, automation, and disaggregation
- Quantum communication systems and networking
- Optical network security
- Optical network control and management
- Digital twin in optical networks and streaming telemetry
- Elastic, flexible rate, and flexi-grid optical networks
- Optical network architectures, design, and performance evaluation
- Cross-layer design of optical networks
- Energy-efficient optical networks
- Optical network survivability and availability
- Optical network for inter- and intra-datacenter connectivity
- Optical interconnects for datacenters & high-performance computing
- Optical network testbeds and experiments
- Coding, modulation, and signal processing for optical systems
- Optical and wireless network convergence and mobile x-haul
- Radio-over-fiber
- Free-space optical (FSO) communications and networks
- Intersatellite and space-based optical systems & networking
- Visible light communications and networks
- Camera communications
- Optical wireless channel characterization
- Modulation and coding for optical wireless systems
- Multiple access techniques for optical wireless systems
- Visible light positioning
- Ultraviolet communications and networks
- Underwater optical communications
- Optical wireless vehicular networks

- Hybrid fiber-coax (HFC) networks
- Integrated photonics
- Photonic neural networks

Journal Publication Opportunity

The authors of selected papers from this symposium will be invited to submit an extended version of their work for fast-track review and possible publication in the IEEE Open Journal of the Communications Society.

Important Dates

Paper Submission: 11 October 2023
Notification: 18 January 2024
Camera Ready and Registration: 15 February 2024

How to Submit a Paper

All papers for technical symposium should be submitted via EDAS. Full instructions on how to submit papers are provided on the IEEE ICC 2024 website: https://icc2024.ieee-icc.org/