

QUANTUM NETWORKS

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Research Group: Information & Computing Lab

The Information & Computing Lab (Iclab) is a research group with over 12 years of experience that aim to foster experimentation and development at the crossroads of data analysis techniques and ICTs, which serve as key drivers of the emerging digital economy and society. We have four main areas of expertise: (1) decentralized learning, including decentralized federated learning, continual learning and split learning; (2) privacy & security, including Byzantine-robustness, coded decentralized computing and differential privacy; (3) IoT/C2E computing, including Decentralized federated learning over IoT and Cloud-to-Edge computing; and (4) quantum networks, including Quantum Internet, Quantum Key Distribution (QKD) and Quantum security.

Further information can be found at our webpage (<https://iclab.uvigo.gal>): including comprehensive details about publications members, ongoing research projects, and cooperation and knowledge transfer projects.

Keywords: Foundations Of Quantum Protocols | Distributed Algorithms | Distributed Quantum Computing | Quantum Privacy & Security | RL Quantum Network Control

Research Focus:

This research position will address the design, analysis and practical realization of fundamental algorithms and protocols for quantum networks (QNs) based on distribution of entanglement, encompassing high-fidelity quantum protocols for entanglement generation & sharing, quantum resource allocation & scheduling, photonic computing for networks and quantum datacenters, network utility maximization for QNs, new quantum-native privacy & security primitives in QNs, distributed quantum sensing, and decentralized control techniques for QNs. The profile lies at the intersection of quantum information and network engineering, and the role is to conduct cutting-edge research toward the architectural and operational principles to be used in the first generation of the quantum Internet, including its demonstration in testbeds coexisting with classical networking solutions.