SAC Symposium:
Quantum Communications & Computing

Co-Chairs

- Gui-Lu Long, Tsinghua University, P.R. China. <gllong@tsinghua.edu.cn>
- Michael Ng, University of Southampton, UK. <sxn@ecs.soton.ac.uk> (Vice-Chair)

Scope and Motivation

The scope of this symposium is to explore the opportunities for building bridges between the classical and quantum-domain advances and applications. Over the last decade, a wide variety of experimental quantum communications and processing devices has been invented and used for fundamental demonstrations in laboratories. These results confirm the feasibility of perfectly secure applications in the field of quantum communications and signal processing, including the quantum Internet, quantum key distribution and quantum secure direct communication, quantum sensors, quantum radar, and random number generators, some of which are already commercially available. Companies and governments have started to spend significant amounts of funding in research and development of quantum technologies. However, the road from quantum technology-based devices to large-scale systems has numerous stumbling blocks. Moreover, many technical problems offer opportunities for contributions that leverage the knowhow, engineering, and technologies from the communications and signal processing areas. It is the aim of this symposium to connect researchers from academia and industry for cross-fertilization of ideas and to discuss opportunities and challenges in theory, technology and applications to accelerate innovation in the engineering and development of quantum communication and information processing systems.

Topics of Interest

Original research articles are solicited in, but not limited to, the following topics:

- Quantum key distribution
- Quantum cryptography
- Quantum communications
- Quantum information theory
- Entanglement distillation
- Quantum error correction
- Quantum repeaters
- Quantum networks and network coding
- Quantum systems architecture

- Quantum synchronization
- Quantum machine learning
- Quantum random number generators
- Quantum algorithms
- Quantum computing in the NISQ era
- Quantum sensing & metrology
- Quantum Radar
- Quantum Error Mitigation (QEM)
- Quantum state discrimination
- Experimental results and demonstrations

Biography of the Co-Chairs

Gui-Lu Long was born in Shandong, China, received his BS from Shandong University in 1982 and Ph.D. from Tsinghua University in 1987. He is professor at Tsinghua University & Vice-President, Beijing Academy of Quantum Information Sciences. He was a SERC research fellow in the University of Sussex in 1989-93. His proposed the quantum secure direct communication, the linear combination of unitary quantum computing paradigm, an exact quantum search algorithm, and the WISE interpretation of quantum mechanics. He is an APS fellow and IoP fellow. He was former AAPPS president. He won several awards, including the IBM Global Faculty Award and Thomson Reuter Research Front Award.

Michael Ng (Soon Xin Ng) [S'99-M'03-SM'08] received the B.Eng. degree (First class) in electronic engineering and the Ph.D. degree in telecommunications from the University of Southampton, Southampton, U.K., in 1999 and 2002, respectively. From 2003 to 2006, he was a postdoctoral research fellow working on collaborative European research projects known as SCOUT, NEWCOM and PHOENIX. Since August 2006, he has been a member of academic staff in the School of Electronics and Computer Science, University of Southampton. He was involved in the OPTIMIX and CONCERTO European projects as well as the IU-ATC and UC4G projects. He was the principal investigator of an EPSRC project on "Cooperative Classical and Quantum Communications Systems". He is currently a Professor of Next Generation Communications at the University of Southampton.

His research interests include adaptive coded modulation, coded modulation, channel coding, space-time coding, joint source and channel coding, iterative detection, OFDM, MIMO, cooperative communications, distributed coding, quantum communications, quantum error correction codes, joint wireless-and-optical-fibre communications, game theory, artificial intelligence and machine learning. He has published over 260 papers and co-authored two John Wiley/IEEE Press books in this field.

He is a Senior Member of the IEEE, a Fellow of the Higher Education Academy in the UK, a Chartered Engineer and a Fellow of the IET. He acted as TPC/track/workshop chairs for various conferences. He serves as an editor of Quantum Engineering. He was a guest editor for the special issues in IEEE Journal on Selected Areas in Communication as well as editors in the IEEE Access and the KSII Transactions on Internet and Information Systems. He is one of the Founders and Officers of the IEEE Quantum Communications & Information Technology Emerging Technical Subcommittee (QCIT-ETC). He was the programme leader of Electrical and Electronic Engineering (EEE) during 2018 – 2021 and has been the ECS Doctoral Programme Director since 2021, at the University of Southampton.

How to Submit a Paper

All papers for technical symposia should be submitted via EDAS. Full instructions on how to submit papers and important deadlines are posted at https://globecom2023.ieee-globecom.org/