

# IEEE Transactions on Consumer Electronics

## Call for Papers

### Special Section on “Advanced Learning Intelligence in Quantum-Enabled Consumer Applications”

#### Theme:

The involvement of advanced emerging technologies such as quantum computing makes consumer applications more intelligent, secure and digitalized to make complex problem solving. It is based on qubits (quantum bits), the basic unit of information to run and solve multidimensional quantum algorithms. The properties of quantum mechanics and quantum theory support secure communication, computation, and trusted data storage, which is impossible by using classical solutions. It also improves the quality of delivery and way of solving real-life problems. The Quantum-Enabled Consumer Applications (QECA) include positioning systems, finance, logistics, optimization, security applications in the communication system, gravimetry, and many more. The quantum-safe is the most promising approach to secure sensitive consumer applications that are digitalized and accessed through remote places like healthcare, banking, and positioning applications. Regardless of the growing QECA, it is important to take all the necessary steps to protect consumer application information, consumer products, and consumer services. The sensitivity and importance of consumer application information play an important role in accessing and decision-making quantum application services.

Even though cryptographic solutions like Shor's algorithm, quantum key distribution (QKD), and quantum random number generator are available, but still the protection of personal data and privacy is a challenging issue in remote consumer applications. The lack of security practices introduced more cases of sophisticated cyberattacks, data thefts, damage of social reputation, serious harm of application assets, and many more. Thus, enhanced prevention strategies, efficiency improvements, surveillance systems, and revolutionary approaches are needed that support learning quality with the desired level of security. The explosion of new advanced learning techniques like Machine Learning (ML), Deep Learning (DL), Federated Learning (FL) and Artificial Intelligence (AI) introduced new ways to secure QECA. The integration of these techniques with the QECA provides a set of powerful tools to extract hidden information and related knowledge used to detect vulnerabilities, threats, and attacks. It also performs complex calculations and evaluates large amounts of crucial information in consumer applications.

This Special Section (SS) on “Advanced Learning Intelligence in Quantum-Enabled Consumer Applications” aims to elaborate on the advanced learning intelligence strategy that will provide security and privacy to the QECA. This SS intends to collect quality and ongoing research articles on this current topic. The SS addresses the current taxonomy and security practices with the help of advanced learning intelligence. We invited researchers, developers, and practitioners from academia and industry to contribute original research articles in terms of theoretical and experimental solutions.

#### Topics of interest in this Special Section include (but are not limited to):

- The current state of vulnerabilities detection methods for QECA
- Understanding cyberattacks based on learning intelligence for QECA
- Architectural solutions for QECA
- Challenges and opportunities for QECA
- Data analytics and modelling techniques for QECA
- Case studies for QECA based on learning intelligence
- Learning risk and threat management
- Data-driven algorithms for QECA
- Advances in deep quantum learning
- Intelligent security awareness policies and procedures
- Quantum machine learning for QECA
- Learning metrics and assessment strategies for QECA
- Secure strategy and data Integrity for QECA

### Important dates:

- End of submission of Manuscripts: **August 30, 2023**
- Expected publication date (tentative): April 2024

### Guest Editors:

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### Instructions for authors:

Manuscripts should be prepared following guidelines at: <https://ctsoc.ieee.org/publications/ieee-transactions-on-consumer-electronics.html> and must be submitted online following the IEEE Transactions on Consumer Electronics instructions: <https://ctsoc.ieee.org/publications/ieee-transactions-on-consumer-electronics.html>. During submission, the Special Section on "**Advanced Learning Intelligence in Quantum-Enabled Consumer Applications**" should be selected.