

IEEE Transactions on Consumer Electronics

Call for Papers

Special Section on “Improving Safety and Reliability of Artificial Intelligence in Consumer Electronics”

Theme:

During recent decades, the development of artificial intelligence (AI) technologies has driven the evolution of modern consumer electronics, e.g., smart phone, smart home, autonomous driving, next generation communications, etc. AI applications nowadays support all types of consumer activities, from workings to dwellings. Via exploiting the power of advanced AI techniques, e.g., deep neural networks, reinforcement learning, evolutionary computing, knowledge engineering, intelligent robotics, and smart sensing, etc., the AI-empowered applications such as image classification, objective recognition and fault detection have contributed significant improvements in efficiency, quality, and sustainability in the consumer electronic systems.

While people are encouraged by the capability of AI to perceive, digest, and learn the knowledge, there are also increasing concerns with its safety and reliability. In consumer electronics, intended attack on data source, communication, and local computation node, and other components, may cause the falling down of AI service. Furthermore, real-world noisy signals and uncertainties may influence AI to make bias or even opposite decisions. The safety and reliability of AI have therefore become a key issue of nowadays AI studies. Can we explain the results from deep neural networks or reinforcement learning? Can we trust AI to take over the important tasks in risky and uncertain environments? Are there proper manners to enhance safety and reliability of AI technologies? Such questions imply the existence of a gap between the state-of-the-art AI researches and demands from practical industrial applications, incurring further challenges to fulfill emerging intelligent industrial applications in practice.

While AI researchers and practitioners keep exploring the improvement of computational efficiency and decision-making accuracy, there is also urgency of studies from alternative perspectives, such as the safety and reliability requirements on AI techniques. Thus, the goal of this special issue is to present the state-of-the-art works that pursue the enhancement of safety, reliability, and explainability in AI driven consumer electronic systems. The scopes of this special issue include theoretical results, secure coding and networking, resilient cyber physical system, explainable and reliable deep neural networks, and other advanced applications. Moreover, this special issue seeks to build a platform for researchers from different disciplines and sectors to present their theoretical and technological advancements to promote the development of AI-empowered consumer electronics.

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

- Explainable machine learning in consumer electronics
- Explainable reinforcement learning in consumer electronics
- Robust optimization in consumer electronics
- Performance guaranteed bio-inspired AI approaches in consumer electronics
- Multi-criteria decision making for consume-side computational tasks
- Coevolutionary neural networks for consume-side computational tasks
- Performance guaranteed robust control in consumer electronics
- Reliable operation and maintenance in consumer applications
- Resilience enhancement in consumer electronics
- Fault detection and diagnosis in consumer electronics
- Secure blockchain in consumer applications
- Data-driven predictive control in consumer applications
- Reliable multi-agent system in consumer electronics

- Reliability and safety constrained management in smart homes
- Safety guaranteed control in autonomous driving
- Safety guaranteed control in robotics and unmanned ariel vehicles (UAV)
- Networking Safety in cyber physics system
- Safety guaranteed management in cyber physical system

Important dates:

- End of submission of Manuscripts: **February 1, 2023**
- Expected publication date (tentative): August 2023

Guest Editors:

- ♦ Zhou Wu, Chongqing University, China, zhouwu@cqu.edu.cn
- ♦ Reza Malekian, Malmö University, Sweden, reza.malekian@mau.se
- ♦ Bo Wang, Huazhong University of Science and Technology, China, wb8517@hust.edu.cn
- ♦ Weiwei Wu, Southeast University, China, weiweiwu@seu.edu.cn
- ♦ Xianming Ye, University of Pretoria, South Africa, Xianming.Ye@up.ac.za

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 **“Improving Safety and Reliability of Artificial Intelligence in Consumer Electronics”** should be selected.