

IEEE Internet of Things Journal (IoT-J) Special Issue on  
**Empowering the Future Generation Systems: Opportunities by the Convergence of Cloud, Edge, AI, and IoT**

The digital revolution is characterized by the convergence of technologies — from edge computing to cloud, Artificial Intelligence (AI), and Internet of Things (IoT) — blurring the lines between the physical and digital worlds. Although the four distinct technologies evolved independently over time, they are increasingly becoming more intertwined. With more adaptation and development, we are seeing a persistent convergence and fusion of these technologies resulting in an unprecedented paradigm shift that is expected to disrupt and reshape the next generation systems in all the sectors in a way that the capabilities of the technologies are aligned in the best possible way. Although the convergence of the four technologies can potentially tackle major shortcomings of today's systems, its adoption is still in its infancy phase, suffering from various issues, such as lack of consensus towards any reference models or best practices. To enable this transformation and boost the value created by the aforementioned technologies, this special issue solicits original work in all avenues of the next-generation systems based on the fusion of Edge, Cloud, AI, and IoT. The list of possible topics includes, but not limited to:

- Novel theories, concepts, and paradigms of the Convergence of AI, IoT, and Edge-Cloud
- Standardization activities for Cloud, Edge, IoT, and AI as well as their convergence
- Architecture design between Cloud and Edge for IoT
- Edge-Cloud computing technologies, services and applications
- Infrastructure – hardware, middleware and software
- Edge computing and distributed Cloud
- Distributed computing architectures, algorithms, and models
- Digital twin and metaverse using IoT data
- Co-design of data and computation management
- AI for Quality-of-Service (QoS) management in IoT
- Edge-Fog-Cloud interplay
- Serverless management of IoT systems
- Communication-aware Design between Cloud and Edge
- QoS-aware computing offloading between Edge and Cloud in IoT
- Adaptive and scalable networks
- Constraint satisfaction
- Dynamic resource provision and consuming
- Management – scheduling, resource scaling, deployment, orchestration, monitoring, benchmarking, and metering
- Event-driven programming model
- Quantum and Blockchain based serverless edge computing
- Containerization, microservices and serverless computing
- Distributed execution frameworks
- Collaborative and federated analytics
- Big data capture
- IoT data analytics
- Machine learning and data science in/for Edge-Cloud IoT
- ML-enabled methods, systems, infrastructure, and open issues
- Explainable AI for IoT data processing
- Privacy-Preserving machine learning techniques
- Data mining and machine learning tools in cloud computing
- Data usage control
- Data ownership management
- Security, Privacy, and Trustworthiness
- Adversarial examples attacks and defense
- The role of DLT and Blockchain in the convergence of AI, IoT, and Edge-Cloud
- Application and case studies (Healthcare, Industry 4.0, Energy, Smart City, Finance, etc.)

#### IMPORTANT DATES

Submissions Deadline: October 15, 2021  
Revision Due: January 15, 2022  
Final Manuscript Due: February 29, 2022

First Reviews Due: November 30, 2021  
Second Reviews Due: February 15, 2022  
Publication Date: 2022

#### SUBMISSION

All submitted papers must be clearly written in excellent English and contain only original work, which has not been published by or is currently under review for any other journal or conference. Author guidelines and submission information can be found at <http://iot.ieee.org/journal>. All manuscripts and any supplementary material should be submitted through IEEE Manuscript Central, <http://mc.manuscriptcentral.com/iot>. The authors must select as “SI: Empowering the Future Generation Systems: Opportunities by the Convergence of Cloud, Edge, AI, and IoT” when they reach the “Article Type” step in the submission process.

**Best Selected Papers of IEEE COINS 2021 (<https://coinsconf.com/>):** A manuscript must contain a significant amount of new and substantive material, and it must include the conference presentation as its first cited reference. In order to aid the review process, authors submitting manuscripts based upon COINS presentations must upload a copy of the conference paper as a supplementary file and highlight the new sections, figures, etc. in the expanded manuscript to expedite processing.

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