CFP of IEEE IoT Journal SI on

Responsible and Trustworthy AI for 6G Internet of Things (6G-IoT)

As the fifth generation of communication systems (5G) has been realized worldwide, industry leaders and researchers are working towards the design and development of sixth generation communication systems (6G). The idea is to make the next generation of communication systems more reliable, faster, and able to accommodate a large number of devices. The data rate for the 6G system is estimated to be in terabits per second (Tbps), which is not possible to achieve with the current generation of communication system.

On the other hand, Internet of Things (IoT) has entered into an era where billions of devices are being used in the context of autonomous vehicles, industrial machines, wearable devices, and smart sensors, respectively. All of the IoT devices are capable of not only communicating with each other but also have the capability of exchanging data as well as services. It is said that IoT will be an enabling technology for 6G networks. However, it is also true for the other way around. Currently, IoT is constrained by the limited capability of 5G network, thus restricting the potential of IoT. The emergence of 6G networks will provide the base infrastructure for the IoT to venture into new territories. The 6G will enable real-time communication between cloud servers and IoT devices along with ultra-low latency and increased bandwidth. The aforementioned characteristics will lay the foundation for complex applications including smart cities, traffic flow optimization, and mission-critical IoT applications. Studies have been proposed already for the hypothetical design of such applications.

However, many studies have recently emphasized the IMT 2030 6G vision and EU AI Act that focuses on the responsible and trustworthiness of Artificial Intelligence (AI) models and services, which is a core part of both the 6G and current IoT systems. The importance of responsible and trustworthiness of AI models and services in integrated 6G and IoT (6G-IoT) networks have been highlighted by several communication companies and standard organizations such as Huawei, Ericsson, Nokia, China Mobile, IEEE, ETSI, and 3GPP, in their white papers, proposals, and initiatives. Furthermore, EU AI ACT heavily emphasizes the reliability and trustworthiness of AI models when used for 6G-IoT services.

Although there is a lot of hype around the Reliable and Trustworthy AI for 6G-IoT services, the clarity on its role, characteristics, and implementation is still an open issue. Some researchers equate Reliability and Trustworthiness to Security and privacy, while others confuse it with explainability and reduction of biases. Another important issue around reliability and trustworthiness is the lack of indicators and metrics to measure the performance. This special issue tends to address both of the aforementioned issues from industry and academia perspectives. The objective of this special issue is to attract papers that provide theories, standards, technologies, and applications concerning the Reliability and Trustworthiness of AI for 6G-IoT services. The special issue will also welcome high-quality review articles for defining the roles or Reliable and Trustworthy AI services in the context of 6G and IoT applications. Potential topics of interest but not limited to are as follows:

- Standardization and Guidelines for Reliable and Trustworthy AI services.
- Evaluation and Testing for Reliable and Trustworthy 6G-IoT.

- Integration of Reliability and Trustworthiness in 6G-IoT architecture.
- Machine Learning techniques for Reliable and Trustworthy 6G-IoT.
- Definition of Reliable and Trustworthy 6G-IoT from the lens of EU AI ACT.
- Industrial Adaptation of Reliable and Trustworthy 6G-IoT.
- Distribution learning technology for Reliable and Trustworthy 6G-IoT.
- New Architectures and Frameworks for Reliable and Trustworthy 6G-IoT.
- Explainability of AI models for Reliable and Trustworthy 6G-IoT.

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Important Dates

- Submission Deadline Extended: July 30th, 2025
- Initial Decision Date: August 30, 2025
- Revised Manuscript Due: September 30, 2025
- Second Reviews Due/Final Decision Date: November 30th, 2025
- Final Manuscript Due: December 31st, 2025
- Publication Date: March 2026

Submission Guidelines

All original manuscripts and revisions must be submitted electronically through IEEE author portal: https://ieee.atyponrex.com/journal/iot. Solicited original submissions must not be currently under consideration for publication in other venues. Author guidelines and submission information can be found at https://ieee-iotj.org/