Special Issue

Data Privacy and Protection in IoT Systems

Message from the Guest Editors

Data privacy and protection in IoT systems address critical challenges arising from the proliferation of interconnected devices in smart cities, healthcare, industrial automation, and consumer applications. IoT devices, often deployed at the edge with limited security mechanisms, are threatened by unauthorized data access, device tampering, identity theft, and eavesdropping. Key solutions to these issues include lightweight encryption for resource-constrained devices, blockchain-based authentication to ensure data integrity and decentralized trust, and privacy-preserving techniques such as hidden-policy access control and network coding, which anonymize sensitive information. Edge/fog computing architectures further mitigate latency and bandwidth issues while enhancing localized security. However, challenges related to scalability, energy efficiency, regulatory compliance (e.g., GDPR, CCPA), and resilience against evolving threats such as adversarial AI attacks persist. Future research should therefore address standardization, AI-driven threat detection, and cross-domain collaboration to balance innovation with robust privacy safeguards .

Guest Editors

Dr. Chengzu Dong
School of Data Science, Lingnan University, Hong Kong 999077, China

Dr. Shao Di
Pengcheng Laboratory, Shenzhen 518066, China

Dr. Aiting Yao
Pengcheng Laboratory, Shenzhen 518066, China

Deadline for manuscript submissions

20 February 2026

Electronics

an Open Access Journal by MDPI

Impact Factor 2.6
CiteScore 6.1

mdpi.com/si/249457

Electronics
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
electronics@mdpi.com

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Editor-in-Chief

Prof. Dr. Flavio Canavero
Department of Electronics and Telecommunications, Politecnico di Torino, 10129 Torino, Italy

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