

Special Issue

Robust Optimization in Federated Learning for Industrial IoT: Mathematical Foundations

Message from the Guest Editors

As the Industrial Internet of Things (IIoT) continues to reshape industrial landscapes, Federated Learning (FL) has emerged as a promising paradigm for collaborative machine learning across decentralized edge devices. However, the inherent challenges of dealing with uncertainties, security threats, and privacy concerns in IIoT environments necessitate robust optimization techniques. However, we can: explore novel mathematical models that enhance the robustness of FL in the face of uncertainties; develop mathematics solutions that integrate security measures into FL process, ensuring the integrity of model updates; introduce robust optimization techniques that minimize communication overhead in IIoT environments. This Special Issue aims to explore the mathematical foundations of robust optimization in FL for the Industrial IoT, providing a platform for researchers and practitioners to address critical issues and propel the field forward. This Special Issue aims to advance the understanding and application of robust optimization in FL for the IIoT through rigorous mathematical foundations. Your contributions are vital in shaping the future of intelligent and secure IIoT systems.

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Message from the Editor-in-Chief

The journal *Mathematics* publishes high-quality, refereed papers that treat both pure and applied mathematics. The journal highlights articles devoted to the mathematical treatment of questions arising in physics, chemistry, biology, statistics, finance, computer science, engineering and sociology, particularly those that stress analytical/algebraic aspects and novel problems and their solutions. One of the missions of the journal is to serve mathematicians and scientists through the prompt publication of significant advances in any branch of science and technology, and to provide a forum for the discussion of new scientific developments.

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