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Special Issue Reprint

Architectures, Protocols and Algorithms of Sensor Networks

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The Special Issue “Architectures, Protocols and Algorithms of Sensor Networks—Second Edition” continues a successful research line by presenting recent advances that address the rapidly evolving requirements of modern sensor network applications. As sensor systems become an integral yet often invisible layer of digital infrastructure, their role expands across industrial automation, smart environments, healthcare, transportation, and environmental monitoring. This Reprint gathers contributions that reflect current trends in the design and optimization of sensor networks, with particular emphasis on scalability, energy efficiency, reliability, and intelligent data processing. The included works explore novel distributed algorithms, edge computing integration, machine learning techniques, and adaptive communication protocols tailored for dynamic and resource-constrained environments. Topics such as time-sensitive networking, reinforcement learning-based control, and visibility-aware distributed systems highlight the shift toward more autonomous and resilient network operation. A central focus of this collection is extending network lifetime and improving quality of service under real-world constraints, including limited energy resources, heterogeneous connectivity, and complex deployment scenarios. In parallel, the Reprint addresses challenges related to security, data integrity, and system interoperability, which are critical for the deployment of trustworthy large-scale sensor infrastructures.

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