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Internet of Things - The Call of the Edge

Everything Intelligent Everywhere

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This book provides an overview of the Internet of Things (IoT) - covering new ideas, concepts, research and innovation to enable the development of IoT technologies in a global context. The work is intended as a standalone book in a series covering the activities of the Internet of Things European Research Cluster (IERC) - including research, technological innovation, validation, and deployment.

The book chapters build on the developments and innovative ideas put forward by the IERC, the IoT European Large-Scale Pilots Programme and the IoT European Security and Privacy Projects - presenting new concepts, ideas and future IoT trends and ways of integrating open data frameworks and IoT marketplaces into larger deployment ecosystems.

The IoT and Industrial Internet of Things technologies are moving towards hyperautomated solutions - combining hyperconnectivity, artificial intelligence (AI), distributed ledger technologies and virtual/augmented extended reality, with edge computing and deep edge processing becoming an assertive factor across industries for implementing intelligent distributed computing resources and data to keep the efficient data exchange and processing local to reduce latency, exploit the sensing/actuating capabilities and enable greater autonomy.

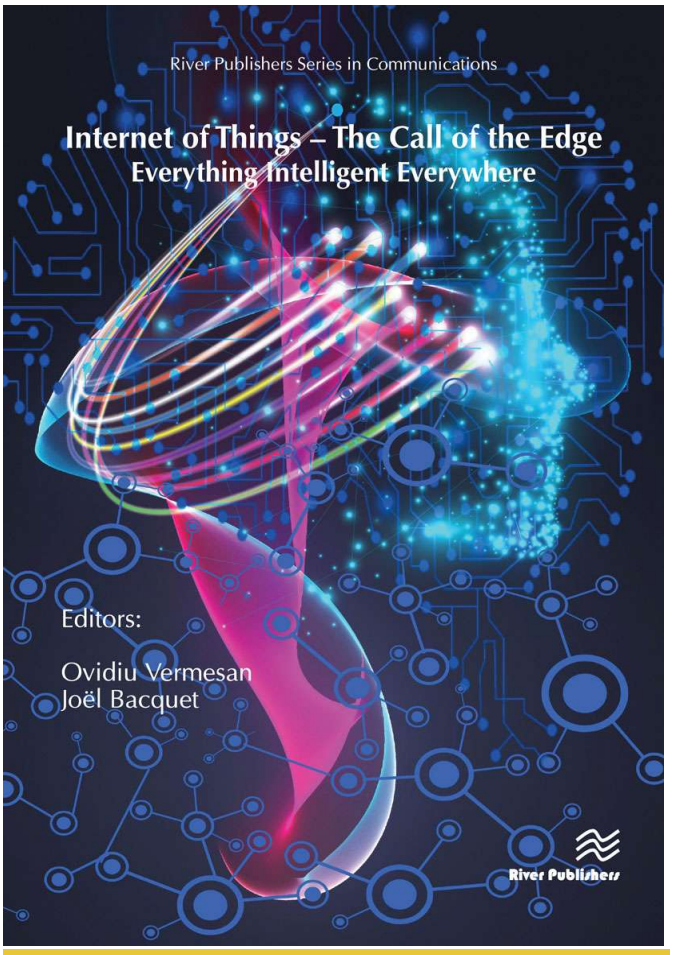
Expanding the adoption of consumer, business, industrial and tactile IoT requires further development of hyperautomated IoT concepts for collaborative solutions involving machines and humans to expand augmented creativity at the application level using AI to optimise the industrial processes and progress towards a symbiotic economy based on distributed federated cloud/edge infrastructure allowing resource sharing in the form of computing, memory and analytics capabilities.

The advances of autonomous IoT applications delivering services in real-time encompasses development in servitisation, robotisation, automation and hyperconnectivity, which are essential for the rapid evolution of industrial enterprises in the new digital era. The rise of digital twins integrated into IoT platforms as fully interactive elements embedded into the simulation and optimisation environment, as well as the embedment of AI techniques and methods, enhances the accuracy and performance of models in the various IoT and Industrial Internet of Things applications.

The convergence of technologies to provide scalable, interoperable IoT-enabled applications pushed the requirements for high bandwidth, low latency and robust and dependable connectivity to support the industry's demand for deeper integration and improved analytics to deliver sustainable competitive advantage products and services, enabling digital transformation with a focus on new business models.

Safety and security are interlinked for the next wave of IoT technologies and applications and combined, prove a greater value for rapid adoption.

The new IoT technologies are essential for facilitating sustainable development, reducing energy consumption and, by supporting the optimisation of products and processes, mitigating unnecessary carbon emissions - thereby reducing the environmental impact through real-time data collection, analysis, exchange, and processing.



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