

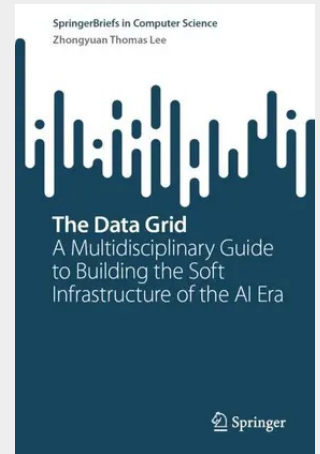
The Data Grid

A Multidisciplinary Guide to Building the Soft Infrastructure of the AI Era

As industries transition from the automation focus of Industry 4.0 to the human–AI collaboration of Industry 5.0, artificial intelligence stands at the forefront. Yet the lasting capability of intelligent systems is rooted in a deeper layer: robust data infrastructures. argues that AI's true scalability and reliability hinge not just on algorithms, but on stable, governed, and semantically structured data systems. Across industries, fragmented and inconsistent data foundations constrain AI's potential. By redefining data as infrastructure' imbued with stability, scalability, and lifecycle continuity, this volume establishes the structural foundation for sustainable intelligence.

Drawing from systems engineering, industrial engineering, reliability theory, and risk management, this book offers a cross-disciplinary framework for building AI-native data infrastructures. While data engineering originates from computer and software engineering, in the infrastructure context, it is not and should not be confined to these disciplines. It shows how principles such as determinism, fault isolation, boundary control, and semantic layering can be adapted for enterprise-level data environments. Supported by engineering analysis and practical case studies, the book redefines data not as a static resource but as a continuously flowing soft infrastructure: an engineered backbone for resilient, long-term intelligent systems.

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