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Automated Machine Learning (AutoML) for Zero-touch Network and Service Management

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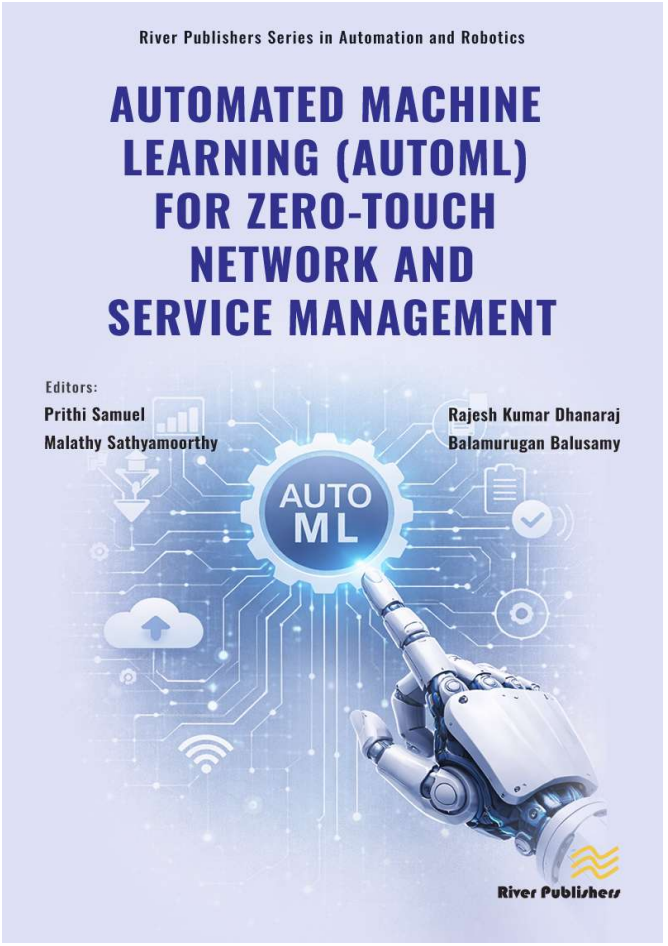
Automated Machine Learning (AutoML) for Zero-touch Network and Service Management provides a comprehensive examination of how AutoML techniques are transforming next-generation network operations. As modern communication networks continue to grow in scale, heterogeneity, and complexity, traditional manual configuration and management approaches have become increasingly impractical. Zero-touch network and service management (ZSM) has therefore emerged as a critical paradigm for enabling autonomous, self-configuring, self-optimizing, and self-healing networks.

This book bridges the gap between machine learning automation and intelligent network management by exploring the role of AutoML in the design, deployment, and operation of zero-touch networks. It presents fundamental concepts, system architectures, and enabling technologies, while addressing key practical challenges such as model selection, hyperparameter optimization, data scarcity, explainability, scalability, and the lifecycle management of machine learning models in real-world operational environments.

Through in-depth discussions, real-world use cases, and emerging research directions, the book offers valuable insights into applying AutoML across network domains, including software-defined networking, network function virtualization, 5G/6G systems, cloud-native services, and edge computing. It serves as both a research reference and a practical guide, it is an essential resource for researchers and practitioners seeking to build intelligent, autonomous, and resilient networked systems.

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