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Sommario/riassunto

"Machine Learning under Resource Constraints addresses novel machine learning algorithms that are challenged by high-throughput data, by high dimensions, or by complex structures of the data in three volumes. Resource constraints are given by the relation between the demands for processing the data and the capacity of the computing machinery. The resources are runtime, memory, communication, and energy. Hence, modern computer architectures play a significant role. Novel machine learning algorithms are optimized with regard to minimal resource consumption. Moreover, learned predictions are executed on diverse architectures to save resources. It provides a comprehensive overview of the novel approaches to machine learning research that consider resource constraints, as well as the application of the described methods in various domains of science and engineering. Volume 1 establishes the foundations of this new field. It goes through all the steps from data collection, their summary and clustering, to the different aspects of resource-aware learning, i.e., hardware, memory, energy, and communication awareness. Several machine learning methods are inspected with respect to their resource requirements and how to enhance their scalability on diverse computing architectures ranging from embedded systems to large computing clusters. Ranges from embedded systems to large computing clusters. Provides application of the methods in various domains of science and engineering."--Provided by publisher.