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Autore	Yao Haipeng
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Sommario/riassunto

This book provides a comprehensive examination of Unmanned Aerial Vehicles (UAV) swarm collaboration from a networking perspective. It systematically analyzes key components such as network topology construction, efficient routing algorithms and resource management strategies. The second chapter addresses adaptive clustering and dynamic network planning, enabling UAV swarms to adjust their topologies and maintain robust structures in fluctuating environments. The third chapter introduces intelligent routing algorithms designed to optimize network resilience and performance metrics, including lifetime, packet delivery rate and throughput. Chapter four investigates resource scheduling challenges proposing virtualization-based strategies for the optimal allocation of computational and communication resources. Chapters five through seven discuss the opportunities and challenges posed by emerging network technologies. It includes encompassing semantic communication for enhanced data transfer efficiency, the application of distributed learning techniques (e. g., federated and reinforcement learning) for intelligent UAV swarm networks and deterministic networking approaches that ensure low-latency, reliable control in UAV precision-critical operations. Overall, this book serves as an authoritative reference that integrates state-of-the-art technologies and algorithmic designs to address the multifaceted challenges and opportunities in UAV swarm networks. It’s designed for advanced-level students, professors, engineers, and researchers learning and working in the fields of the IoT Networks. Industry managers, partitioners and government research agencies working in this field will also find this book a useful reference.