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Sinopsis

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A detailed review of underwater channel characteristics, Underwater Acoustic Sensor Networks investigates the fundamental aspects of underwater communication. Prominent researchers from around the world consider contemporary challenges in the development of underwater acoustic sensor networks (UW-ASNs) and introduce a cross-layer approach for effective integration of all communication functionalities.

Discussing architectures for two- and three-dimensional sensor networks, this authoritative resource clearly delineates the main differences between terrestrial and underwater sensor networks_covering the wide range of topics related to UW-ASNs. It examines efficient distributed routing algorithms for delay-insensitive and delay-sensitive applications and introduces a realistic acoustic model characterized by channel utilization efficiency that enables proper setting of the optimal packet size for underwater communication. It also:

Provides efficient sensor communication protocols for the underwater environment
Addresses the topology control problem for sparse and dense 3D networks
Presents a novel distributed MAC protocol that incorporates a unique closed-loop distributed algorithm for setting the optimal transmit power and code length

The book includes coverage of routing, fault tolerance, time synchronization, optimal clustering, medium access control, software, hardware, and channel modeling. Exploring the need to design an energy-efficient cross-layer protocol suite, this resource provides the understanding required to achieve high-performance channel access, routing, event transport reliability, and data flow control with underwater acoustic sensors.