A Survey on Underwater Wireless Sensor Networks: Requirements, Taxonomy, Recent Advances, and Open Research Challenges

ABSTRACT

The domain of underwater wireless sensor networks (UWSNs) had received a lot of attention recently due to its significant advanced capabilities in the ocean surveillance, marine monitoring and application deployment for detecting underwater targets. However, the literature have not compiled the state-of-the-art along its direction to discover the recent advancements which were fuelled by the underwater sensor technologies. Hence, this paper offers the newest analysis on the available evidences by reviewing studies in the past five years on various aspects that support network activities and applications in UWSN environments. This work was motivated by the need for robust and flexible solutions that can satisfy the requirements for the rapid development of the underwater wireless sensor networks. This paper identifies the key requirements for achieving essential services as well as common platforms for UWSN. It also contributes a taxonomy of the critical elements in UWSNs by devising a classification on architectural elements, communications, routing protocol and standards, security, and applications of UWSNs. Finally, the major challenges that remain open are presented as a guide for future research directions.