

Next Forwarding Node Selection in Underwater Wireless Sensor Networks (UWSNs): Techniques and Challenges

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The underwater wireless sensor network (UWSN) is considered a promising technology for collecting valuable data from underwater areas, particularly for aiding military operations and environmental predictions. UWSNs consist of underwater sensor nodes that have limited energy and use acoustics for communication. Routing in underwater sensor nodes is one of the challenging issues in UWSNs because of the need to forward data packets with minimal energy consumption and a high packet delivery ratio. Selecting the next forwarding nodes is one of the key components of routing in UWSNs and has a direct effect on energy consumption and the packet delivery ratio. Therefore, this problem has gained much attention from the research community with the intent of enhancing the performance of UWSNs. This paper qualitatively reviews routing protocols for UWSNs, focusing on the next-hop selection method and its strengths and weaknesses. A taxonomy is presented for reviewing routing protocols under different categories of the classification. A summary of the qualitative investigation is presented highlighting aims, the next-hop selection method, metrics, and priority considerations. A comprehensive investigation is carried out focusing on energy, link quality, void awareness, reliability, and shortest path characteristics. Finally, we discuss potential future research directions in UWSNs for forwarding node selection.

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