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A systematic review on energy efficiency in the internet of underwater things (IoUT): Recent approaches and research gaps

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Abstract

Due to the advancement of wireless communications, Internet of Things (IoT) becomes a promising technology in today's digital world. For the enhancement of underwater applications such as ocean exploration, deep-sea monitoring, underwater surveillance, diver network monitoring, location and object tracking, etc., Internet of underwater things (IoUT) has been introduced. However, underwater communication suffers from energy consumption due to fluctuations of the underwater environment and operational factors according to the distributions of objects or vehicles in shallow and deep water. The IoT quality of service (QoS) in underwater communication networks is critically affected by the different energy factors related to networking and the physical layer. Network topology and routing protocol are two important major factors affecting the power consumption of IoUT nodes and vehicles. The clustering approach is considered the best choice for IoUT, however it may suffer from various influences related to the underwater environment. The optimisation-based AI technologies in clustering approaches enable to achieve of energy efficiency for IoUT applications. This paper provides a systematic review of different energy efficiency methodologies for IoUT, and classified them according to the strategies used, in addition to the research gaps in clustering-based approaches, and future directions. © 2023 Elsevier Ltd

Author Keywords

Artificial intelligence; Autonomous underwater vehicles; Clustering approach; Energy efficiency; Energy optimisation; Internet of underwater things; Machine learning

Index Keywords

Autonomous vehicles, Energy efficiency, Energy utilization, Internet of things, Machine learning, Network layers, Network security, Power management (telecommunication), Quality of service; Autonomous underwater vehicles], Clustering approach, Digital world, Energy optimization, Internet of underwater things, Machine-learning, Research gaps, Systematic Review, Underwater environments, Wireless communications; Autonomous underwater vehicles

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