23 SENSOR NETWORKS FOR AQUACULTURE MONITORING SYSTEMS

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Abstract

Aquaculture is one of the fastest growing food producing sectors in the world, and its economicm importance is increasing. Due to the increased demand for food, market pressure and growing concern about environmental and food quality issues, special techniques have been developed and applied to increase food production and improve product quality. Scientific advances in recent years in this sector have been facilitated largely by the application of science and the introduction of new technologies[1]. Emerging technologies in areas of sensor network, network computing and ubiquitous computing are enabling the development of practical and innovative solutions, improving monitoring and decision-making capabilities[2]. Innovations in water quality monitoring, fish feeding, biomass estimation, fish behavior monitoring, disease diagnosis and food waste management can not only improve the degree of automation of aquaculture and the level of scientific management, but also reduce the cost of production, improve environmental control and increase product quality[3]. Despite the great progress of science and technology, the optimization and management of production processes of aquaculture systems is facing great challenges[4]. The objectives of the present work are to review and analyze the currently scientific advances in technology applied in aquaculture systems, exploring the processes, architectures, the automation level and the role of sensors and new information technologies in this sector of activity.

References: [1]Bostock, John. 2011. The Application of Science and Technology Development in Shaping Current and Future Aquaculture Production Systems. J. AGR. SC. 149(S1):133–41; [2]Aqeel-Ur-Rehman, Abu Abbasi, Noman Islam, Zubair Shaikh. 2014. A Review of Wireless Sensors and Networks' Applications in Agriculture. Computer Standards and Interfaces 36(2):263–70; [3]Simbeye, Daudi S., Shi Yang. 2014. Water Quality Monitoring and Control for Aquaculture Based on Wireless Sensor Networks. Journal of Networks 9(4):840–49; [4]Berggren, Alexandra. 2007. Thesis: "Aquaculture in Sweden: Towards a Sustainable Future." Stockholm University