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O.A. Postolache ; P.M.B.S. Girao ; J.M.D. Pereira ; H.M.G. Ramos   **All Authors**

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Abstract:
This work was developed in the context of a system for remote water quality monitoring based on a wireless local area network (WLAN) and includes a Kohonen self-organizing map (K-SOM) implementation in order to perform sensor data validation and reconstruction and sensor failure and pollution event detections. Simulation and experimental results are presented.

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I. Introduction

Sea and river water quality monitoring is one of the important activities in the environment-monitoring domain. The number of research and development activities in that area is extremely large. The assessment of water river basin conditions for drinking water is reported by the Guilikeng investigation group [1]. Two networks based on supervision control and data acquisition (SCADA) systems were used to collect data from automatic monitoring stations located on riverbanks. Meanwhile, different commercially available monitoring systems, such as a remote underwater sampling station (RUSS) [2] or YSI [3] are used in different water quality monitoring applications in order to collect multiple water quality parameters (pH, temperature, conductivity, turbidity, heavy metal concentration, etc.) from rivers, lakes, or sea water. The acquired data is usually sent to a central location using mobile phone [global system for mobile communication (GSM), global packet radio service (GPRS) [4], or personal handy-phone system (PHS) [5])], satellite, or VHF [6] technologies.

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