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Architecture, Design and Implementation of a Modular Solution Prototype for Flood and Fire Risk Mitigation in Wetlands

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Our paper presents the architecture, design, and some implementation details of a system aimed at using two novel fire and flood sensors based on miniature sensing technology, processing the real-time acquired data using business intelligence tools for detection of sudden increases in temperature and water levels, and generating visual alerts to wetland administering authorities for better crisis assessment and early response to wetland threats. Besides customizing and connecting the sensors, a communication infrastructure was created, including connectivity with commercially available sensors, the database, the user (through a graphical interface), and modules to process the sensors data and generate alarms. We also developed and integrated a simulator for real-time sensor data. This distributed solution was virtualized in Docker with the aim that potential users could download our work and, in a guided way, be able to redo it. We look forward to developing more modules for monitoring and eco-actions in the Danube Delta, targeting other threats like poaching, fish and bird population dangers, vegetation issues, pollution sources, etc., while also working with wetland administration authorities for better crisis assessment and early response to wetland threats.

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