Demo Case Update

From TZW – DVGW-Technologiezentrum Wasser

1st April 2021

The main topic of TZW in the FIWARE4Water project is water quality monitoring. This includes not only the test of the NANOSensor in the test bench of TZW, but also the evaluation of time series of water quality sensors and the automated detection of anomalies. For this purpose, TZW develops scientific models for event detection.

The event detection is performed by a multistage evaluation of sensor data. First, a univariate assessment of the quality of a sensor's measurement series is performed. For example, a sudden noise or drop in the signal-to-noise ratio is an indicator of a possible sensor malfunction. In a further step, multivariate analysis of the measurement series of several sensors is also performed.

The system first learns the normal state. This describes whether there are correlations between the different sensors or water quality parameters and in which range of values they move. If the normal state is known, deviations from it can be easily detected in a final step as shown in figure 1 on the example of pH value and UV absorption at 254 nm (indicator of dissolved organic matter).

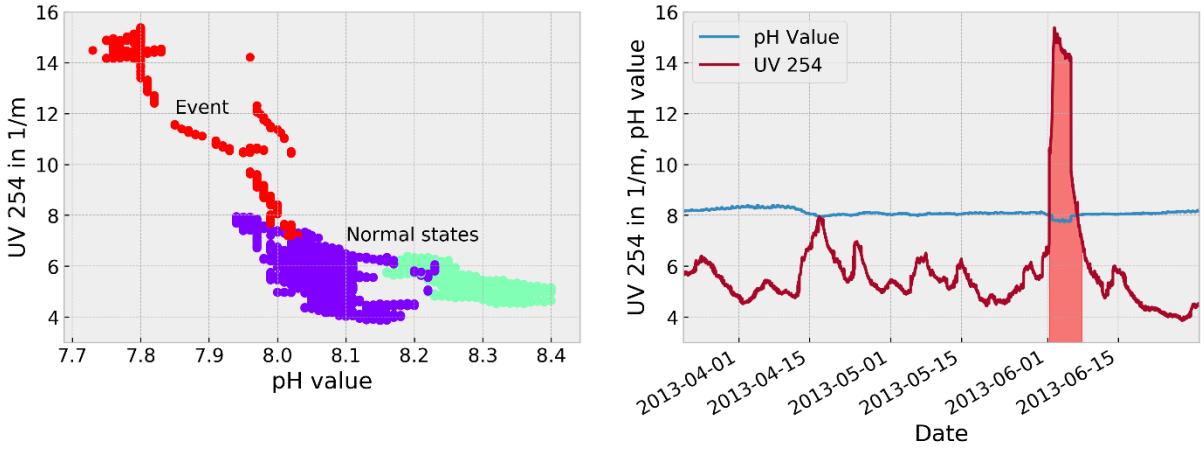

Figure 1: event detection on the example of pH and UV 254 measurements.

In order to test the performance of the models, data from different water quality sensors recorded at the model network of TZW are used. The background is that in reality real events occur very rarely and thus little data is available to evaluate the performance of the event detection. In the model network, on the other hand, various water quality changes and sensor malfunctions can be simulated, thus generating a comprehensive data set for algorithm evaluation.

Author: TZW

Disclaimer

This document reflects only the author's view. The European Commission is not responsible for any use that may be made of the information it contains.

Intellectual Property Rights

© 2021, Fiware4Water consortium

All rights reserved.

This document contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

This document is the property of the Fiware4Water consortium members. No copying or distributing, in any form or by any means, is allowed without the prior written agreement of the owner of the property rights. In addition to such written permission, the source must be clearly referenced.

Project Consortium

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant agreement No. 821036.