

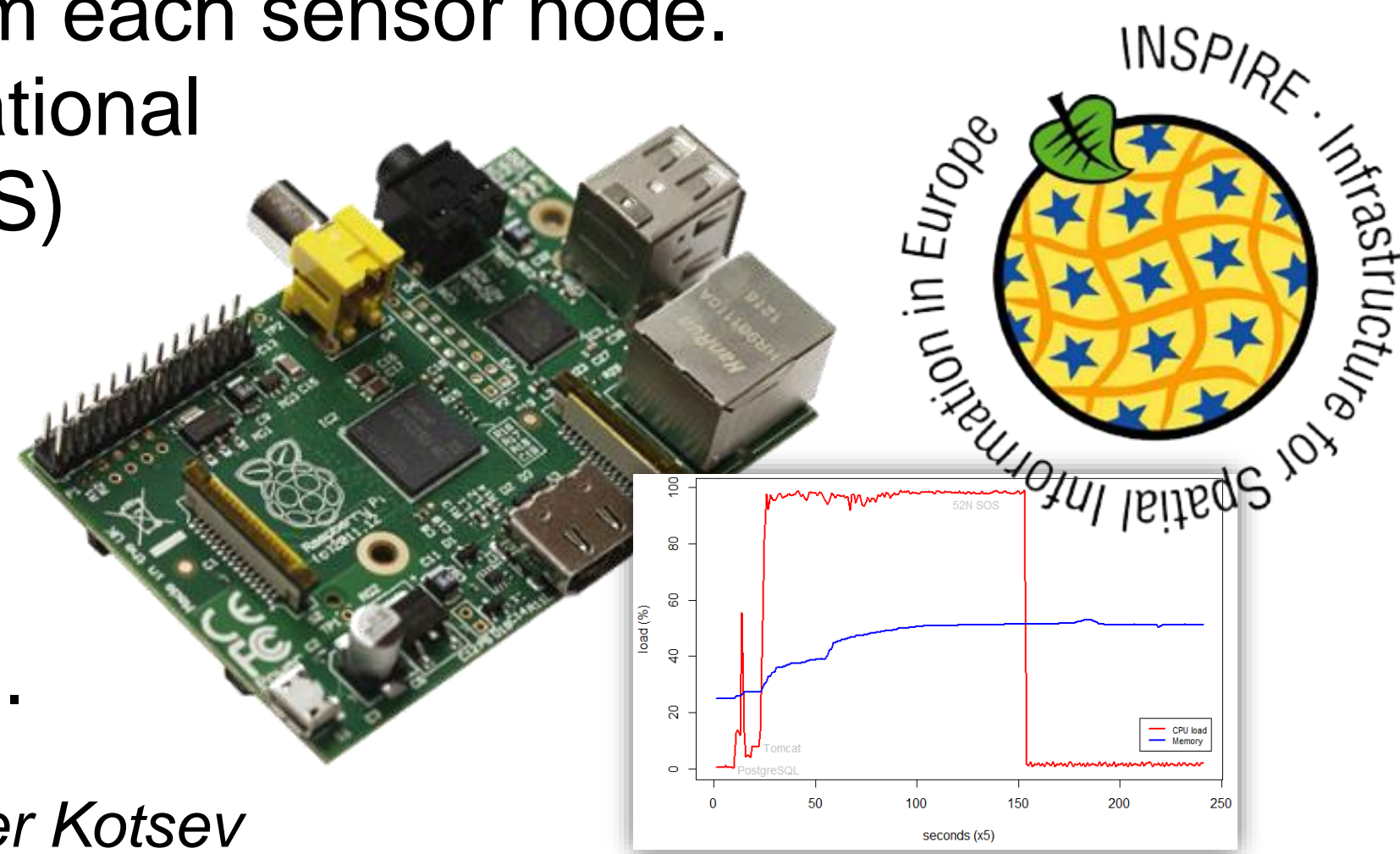
Big Data Analytics with the Internet of Things

including contributions from: Alexander Kotsev, Francesco Pantisano, Frank Ostermann, Sergi Trilles and Sven Schade

Case Study: Service-enabled sensing platform

Considering the particular challenges of handling information from sensor networks and taking an approach of reducing the data transfer and storage needs outside the originally data producing sensors, we investigated a novel methodology for handling data within networks of distributed sensor platforms.

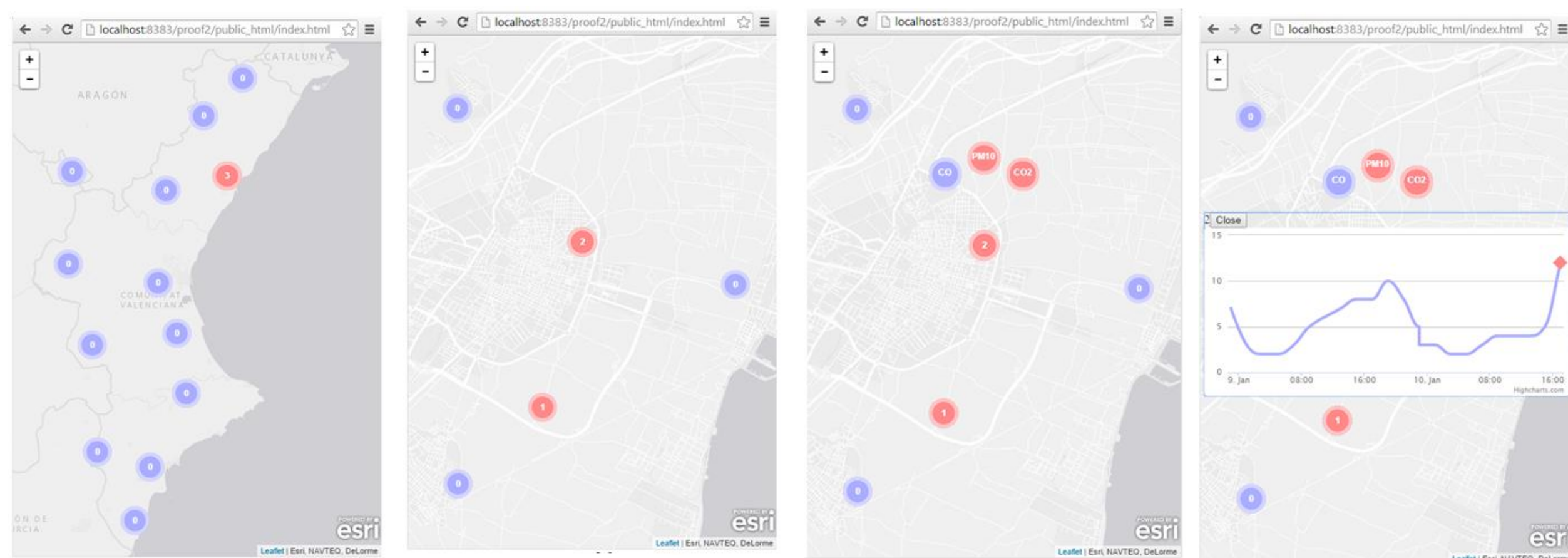
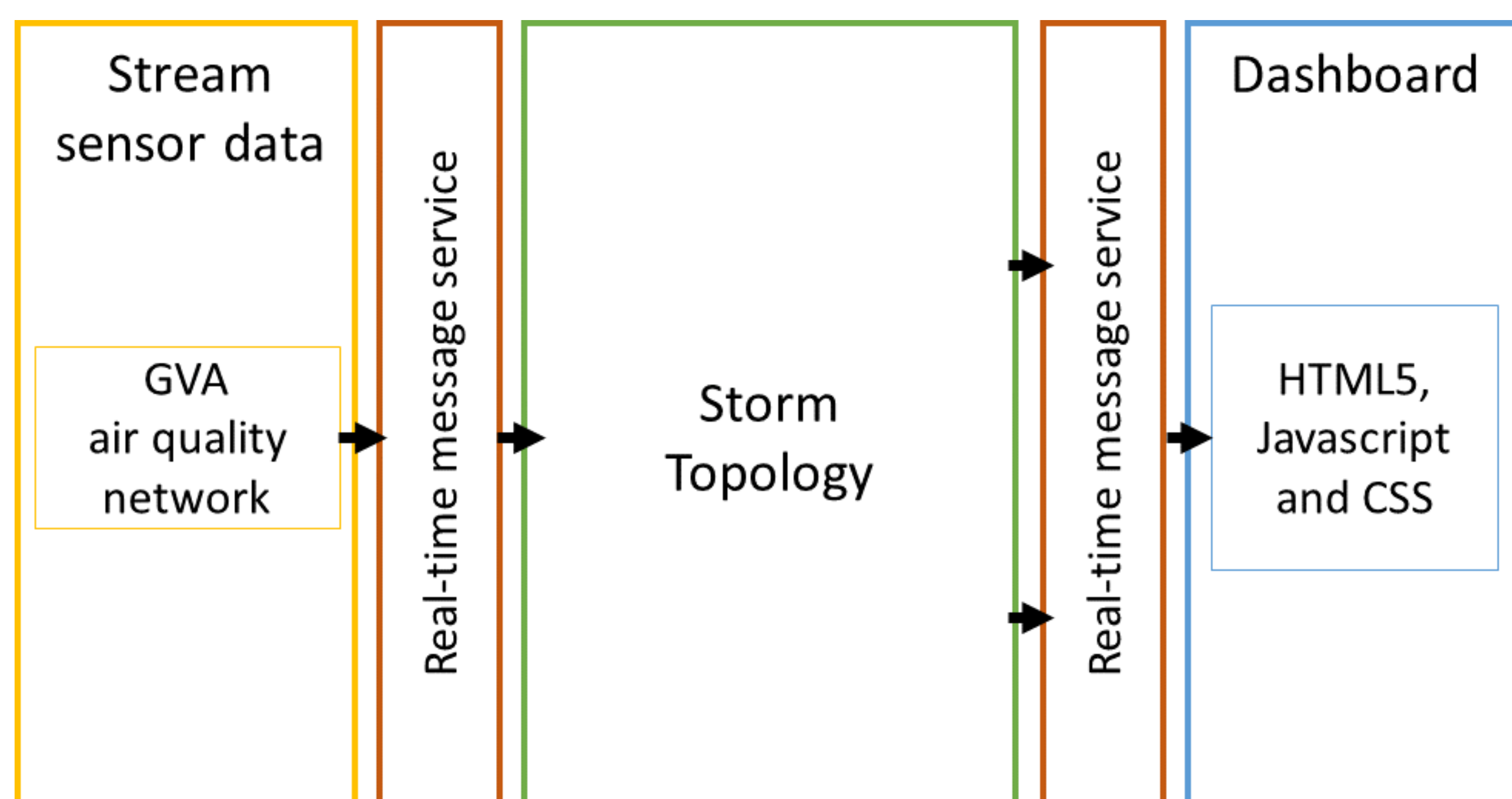
We bundled low-cost hardware (RaspberryPI) together with free and open source software (52 North SOS) in order to establish a platform capable of broadcasting observation data from each sensor node. It is based on international standards (OGC SOS) and can be directly plugged into the Infrastructure for Spatial Information in Europe (INSPIRE).



Case Study lead: Alexander Kotsev

Case Study: Event detection from sensor networks

Increasing data volumes and varieties challenge the efficient analysis of the rich sets of observations that are delivered from today's sensor networks. This case study investigated mechanism to handle the arising flood of monitoring data in real-time. We provided a proof of concept implementation based on the Storm framework (diagram below) and tested in with a regional environmental sensor network (screen capture below).



Case Study lead: Sergi Trilles

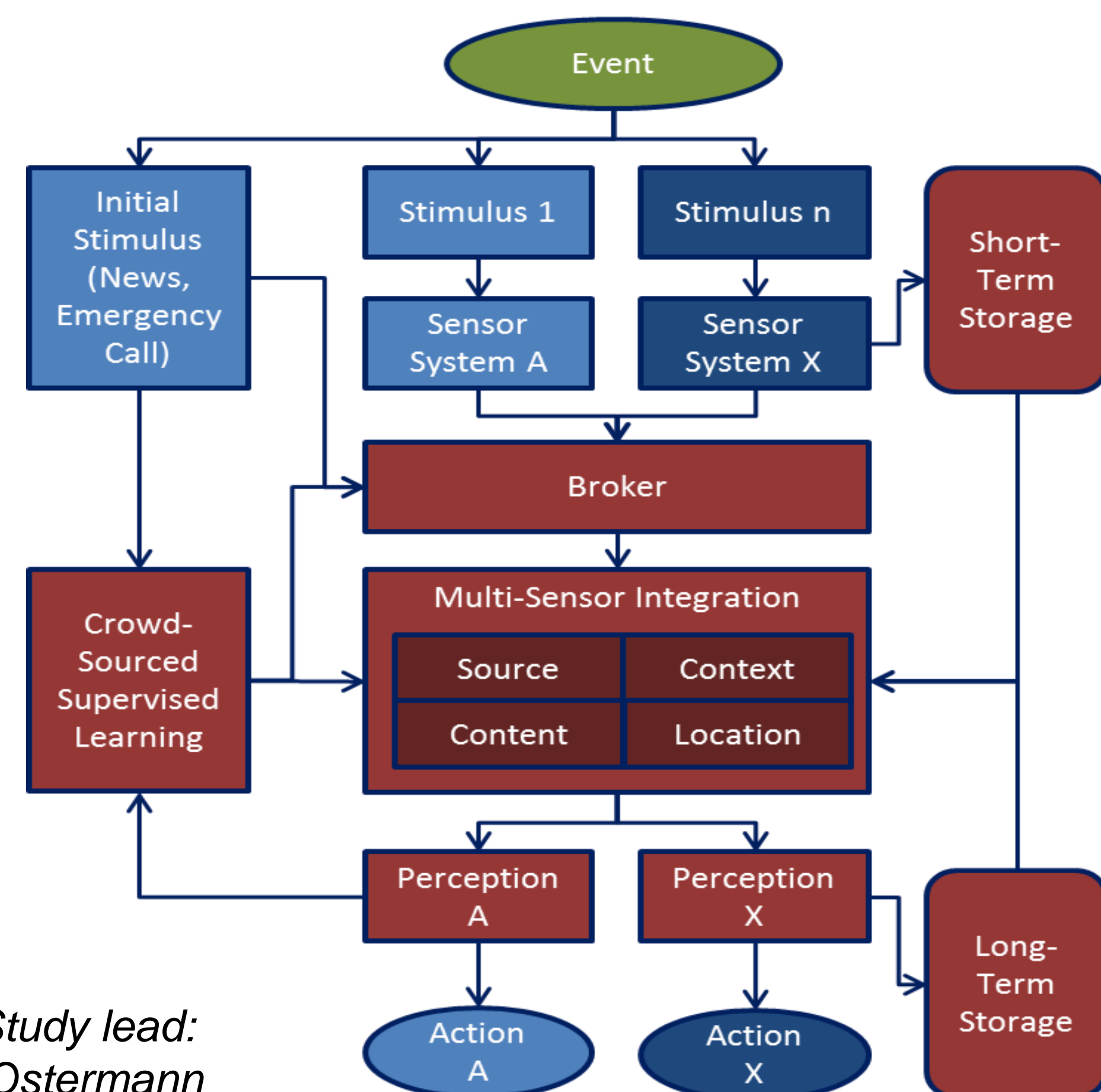
Big Data at the Joint Research Center (JRC)

In summer 2014, JRC Directors' Task Force on Big Data concluded that there is no single solution fitting all Big Data related challenges of the center. We began to investigate a part of the Big Data landscape, with a special focus on case studies of data analytics in the environmental and earth sciences.

This poster presents some of the highlights and illustrates the diversity in respect to sensing technologies and the Internet of Things (IoT).

Case Study: New modes for multi-sensory integration

We began to exploit the potentials of multi-sensory integration to further develop the surrounding concept of a Digital Earth Nervous System, thereby not processing different data streams in parallel, but together (figure below). We found that particularly promising research objectives include the assessment of a sensor's observations' validity through the use of crowd-sourcing to supervise machine-learning of algorithms.



Case Study lead: Frank Ostermann

Next Steps

We will continue to exploit the use of Big Data for spatio-temporal data analytics, especially in support of the combined use of (i) public sector information, including official statistics and authoritative monitoring networks; (ii) commercial data sources, such as mobile phone data or privately owned sensor networks; and (iii) data owned by citizen, especially those from Citizen Sensing initiatives.