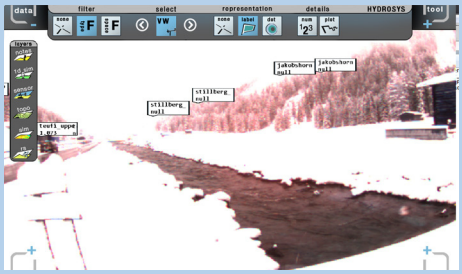
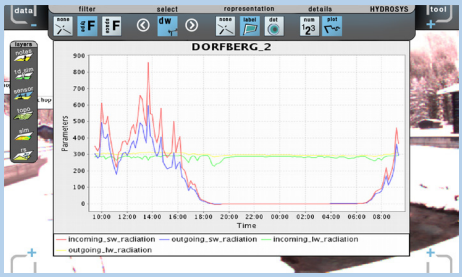
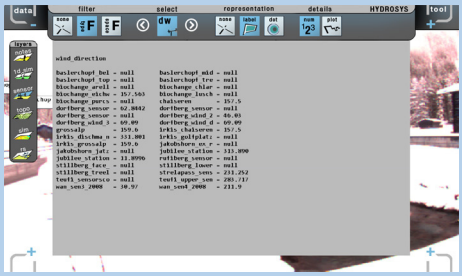


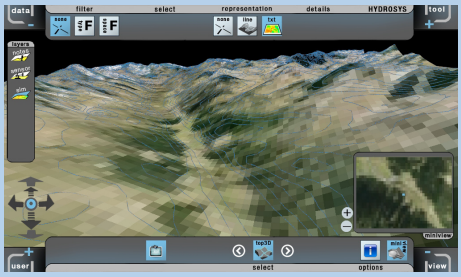
labels showing sensor measurements
in augmented reality mode



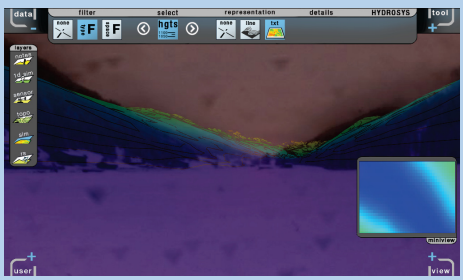
plots of sensor measurements



numeric overview of sensor measurments



multi-view mode: browsing camera footage or
flying over 3D model



perceptual optimizations of simulation data

HYDROSYS

mobile system for environmental monitoring using augmented reality visualization

As a response to drastic changes in the environment, sensor networks for environmental monitoring have been the focus of development in recent years. However, mobile tools for browsing and analysing these data in the field are lagging behind. Current mobile GIS technology is often limited by simple data access and visualization. Instead, we offer a mobile system for in-field environmental monitoring that uses augmented reality (digital data overlaid over live video footage) to provide an integrated view of the environment and the abstract data associated with it. The system aids in the spatial analysis of environmental processes and supports team-based discussion and decision making. The mobile system presented here is the result of a strongly user-centered system design, which has been nurtured by numerous discussions, presentations and monitoring exercises at various sites in Switzerland and Finnland. This has helped us to create a system which has been positively validated by a strong end-user base.

> explore

Users can explore dense sensor network data sets and simulation results. Upon request, the latest state of almost real-time sensor data can be retreived from the sensor network system (GSN). The mobile client accesses up to around 20 different sensor types, but there is no limit in the types of data that can be browsed. Simulation data is received from a number of different systems and has to be pre-processed by semi-automated methods to be shown adequately at the mobile device. Data is visualized in several ways and optimized for outdoor screens, including numeric values in labels, plots, tables and overlays, thus offering traditional and new visualization formats used by geoscientists. As such, we offer multi-variate visualization that aids in improving the understanding of environmental processes. All together, the system offers several tools that optimize the capturing, handling and showing of sensor and simulation data.

> collaborate

The system has been specifically designed to support collaborative work - in the field, but also between the field and office. Users can open a voice communication channel to communicate with collaborators, make notes by using various annotation functions, or share viewpoints by accessing the various camera perspectives that may be available on the site. The combination of the various methods aims at improving the shared awareness between users that may work together to mitigate environmental problems.

> alternatives?

There is no comparible system available that introduces this level of innovation: we offer real-time data access, advanced visualization and novel collaboration methods. Still, the offered system is a research prototype, not a product. There is no mobile GIS tool that has a comparible functionality, even though traditionally, commercial mobile GIS tools may fit better in the traditional workflow when tools from the same software provided are used.

> more information

For more information, feel free to visit our website at www.hydrosysonlone.eu, drop us a line, or visit us for a live demo! Most of the systems are open-source, hence, software can often be acquired for free.

HYDROSYS - FP7 (DG INFSO 224416)
http://www.hydrosysonline.eu
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SEVENTH FRAMEWORK PROGRAMME