Swiss Experiment

Interdisciplinary Environmental Research

HYDROSYS: in-area feedback developed on top of SwissEx technology

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About Hydrosys

Hydrosys is an interdisciplinary EU project, bringing together partners from computer science, engineering, hydrology and natural hazards research.

Aim of the project: Development of a system infrastructure to support various user groups in fieldwork and to provide functionalities which will increase the quality and productivity of the research outcome.

User groups: natural resource management and exploitation e.g. natural hazards management, ski area operators, energy and water resource management, engineers and scientists.

System integration: integration of mobile, flexible field computers (handheld devices) and rapidly deployable sensors into a single sensor network developed according to the requirements of specific user groups.

Handheld device functionality *(Fig. 1):*

- Direct measurements
- On-site triggering of simulation models
- On-site visualisation of sensor data and model results using augmented reality
- Real-time data transfer to other decision makers and interested parties
  → Shared information platform enables quick reactions in critical situations

Fig. 1: Handheld device.

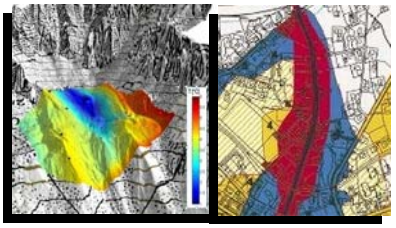


Fig. 2: Simulation results.

Fig. 3: Wet-snow avalanche.

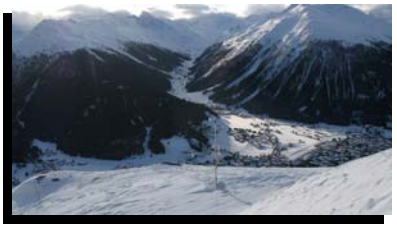
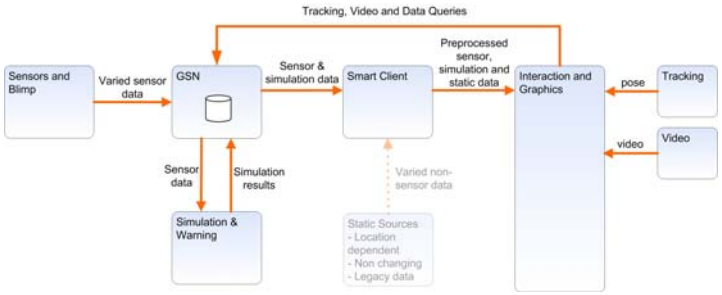


Fig.4. Automatic weather station.

Fig. 5: Sensorscope station.

Use of SwissEx technology

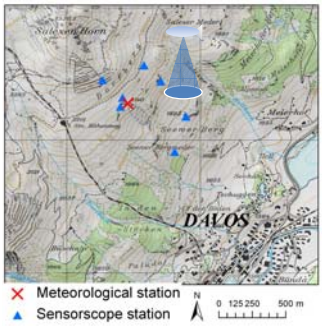
System design:



GSN: provides real-time data streams from multiple sensors as model input and delivers sensor data and model output to the users

Sensorscope: provides dense networks of meteorological sensor data

Application scenario



Example: one of three alpine application scenarios

Impact: Wet-snow avalanches have high impact but are poorly understood

Aim: Support of wet-snow avalanche research at test-site Dorfberg (Fig. 3; Davos, CH)

Sensors:

- Automated weather station (Fig. 4): TA, TSS, TS, HS, RAD, RH, VW, DW, LWC
- Seven Sensorscope stations (Fig. 5): TA, RH, SWR, VW, DW, LWC
- BLIMP: airborne thermal imaging
- Time-lapse photography
- Manual snow profiles and observations

Handheld application:

- Visualisation of
  - Sensor data
  - Simulation results (snow surface model Alpine3D) (Fig. 2)
- Direct measurement of snow temperature and snow water content (sensor)

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