

Research Project Description

The research project is in the framework of environmental monitoring and alerting through wireless sensor networks (WSNs), with a focus on landslide monitoring. Technical aspects will include energy-efficient WSN communication protocols, fault-recovery protocols, network synchronization, event-driven functionalities, internetworking with cellular networks (5G). The activity is focused on an investigation of WSN technologies with the goal of making them more pervasive in landslide monitoring.

Activity Plan

The activity plan includes the following steps.

- 1) State of the art and use cases analysis. The activity will initially include the analysis of the state of the art concerning WSN technologies for landslide and drought monitoring and prevention, with the goal of identifying the main wireless technologies and communication protocols, the main performance metrics, suitable use cases, the stakeholder needs and, where possible, the regulatory framework.
- 2) Data analysis. As a second step of the activity, a systematic analysis of the data gathered in the previous step will be performed, with the aim of identifying the main critical points concerning application of WSN technologies to landslide monitoring, as well as possible technological improvements. Involvement of stakeholders in the data analysis may be considered.
- 3) Identification of solutions. The goal is to delineate possible solutions to the identified critical points. Solutions should address the improvement of existing WSN protocols with respect to the performance metrics defined in step 1 (e.g., synchronization issues, fault recovery, event-driven functionalities, energy efficiency), as well as the use of new cellular network technology to support monitoring. However, they may also concern more practical aspects related, e.g., to WSN installation and interaction with related companies.