ETH
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TIK
Institut für Technische Informatik
und Kommunikationsnetze
Computer Engineering and
Networks Laboratory

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Master/Semester Thesis:

Triggered IMU Sensing on Dual-Processor Platform

Motivation In a recent Master Thesis we have developed a triggered geophone sensor based on the Dual-Processor Platform architecture for wireless sensor nodes. These sensors are currently being deployed in collaboration with geoscience research partners and Swiss authorities for natural hazard process monitoring used in PermaSense [1].
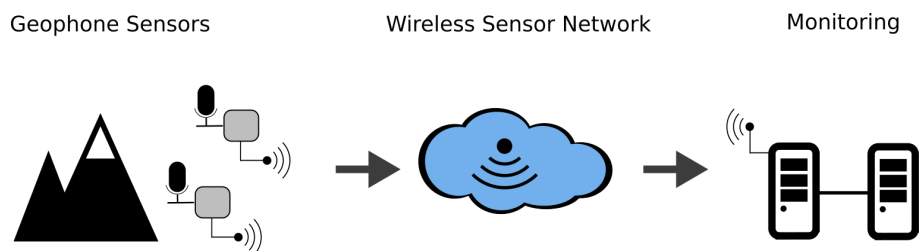
In this thesis we want to extend and explore the sensing capabilities with an Inertial Motion Unit (IMU) that features a tri-axial inclinometer and accelerometer. This IMU is already integrated in the current hardware platform and can be used both in scheduled sampling (periodic/continuous) mode as well as in triggerd mode. I triggered mode the sensor will only wake-up the processor and generate data when a pre-defined signal threshold is exceeded. This allows to operate in low-power modes saving resources when no significant signals are present saving power and also network bandwidth. From the analysis side the challenge is to develop methods for this co-detection of new kind of event-based data from many sensors.

Requirements You should have knowledge in

- Signal processing

- Programming (C/C++)

- Embedded Systems

Interested? Please have a look at http://www.tec.ethz.ch/research.html **and contact us for more details!**

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References

[1] Permansense Project, http://www.permasense.ch/