Bachelor, Master, Internship

Acoustic signal capture and processing into a text-overlay in a video sequence

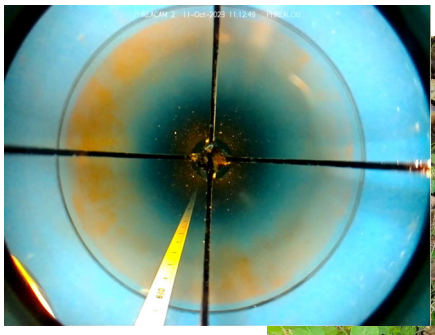
Motivation

To ensure the proper function of groundwater monitoring wells, PHREALOG has developed a autonomous camera inspection system that allows for automatic, unattended camera inspection. The high-resolution video recording is stored directly in the camera probe. In operation mode the camera probe is lowered into the monitoring well by a simple steel cable. In order to obtain a detailed video recording the camera probe runs with a constant speed rate of 1cm/s or 3cm/s. The depth is recorded as image of the scale of a tape measure that is inserted into the well prior to the inspection. The submersion depth can be identified by reading the scale of the tape measure in the recorded video. A deflection pulley with friction brake is used to lower the camera probe into the well. (see QR code)

To avoid difficulties when reading the scale of the tape measure in turbid water and to reduce operating effort, the use of the tape measure as depth indicator is not favorable. A possible alternative solution is to transmit the information of the insertion depth to the camera probe via single acoustic signals, that are layed on and transmitted by the steel cable at defined time or depth intervals. In the camera probe these acoustic signals are recorded, converted into a depth reading and embedded as text in the video recording. A possible signal could be, for example, a harsh, high-frequency friction noise (irregular structure, 1 kHz/ 10 kHz or higher), which is automatically and mechanically applied to the steel cable with each revolution of the deflection pulley.

Scope of work

The task is to capture a sequential acoustic signal with a suitable sensor via micro-processor, process it, and embed it as text overlay in a video recording. The outcome is to be integrated as a demonstrator to a existing test setup. The test setup consists of a hard- and software environment for recording, processing, and storing the video sequence as well as an accessible software with text overlay.



Focus

- ☐ Method development
- ☐ Applied informatics
- ☐ sensor
- ☐ Implementation
- ☐ Analysis and evaluation

Start

Anytime

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Link to Inspection System