



FIGURE 1 IMAGE CREATED BY GEMINI

EMBEDDED SIGNAL PROCESSING FOR DEPTH MEASUREMENTS

Climate change has a large impact on ground water levels. Land owners want detailed real-time insights into the ground water level. This is why a cost-effective sensor has been developed. This sensor will be mounted on top of a pipe with a diameter of roughly 4cm. The sensor hardware is mostly finished, but the software requires some work. The sensor will use a speaker to emit a sound and use a microphone to capture the reflection of the sound on the water surface. Some clever processing is required to determine the distance between ground water level and sensor. The project will mainly focus on this part, a bit of LoRaWAN related software could be involved as well. LoRaWAN is used to send measurements to a central server.

More information on the Smart Groundwater Sensor:

<https://techforfuture.nl/project/2103/>

TASK DESCRIPTION

- Review what chirp (or other signal?) is best to measure depths, also what kind of signal processing is required.
- Implement depth sensing algorithm on an STM32 based SoC.
- Validate proposed solution.

PRACTICAL INFORMATION

- **Student profile:** Applied Computer Science or related
- **Contact person(s):** Bram Ton (b.t.ton@saxion.nl)
- **Lectoraat Ambient Intelligence:** saxion.nl/ami