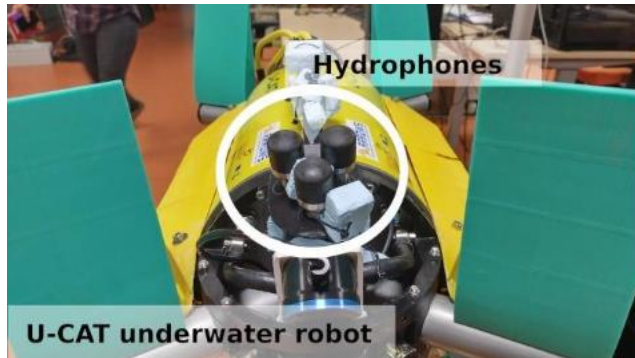


Thesis Topic: High frequency audio interface for an underwater robot



What's this about?

In an underwater environment, knowing where you are, can be quite important. GPS doesn't work and often you can't see much. That's why underwater robots use sound waves to position themselves relative to a sound source with a known position.

The underwater robot U-CAT has hydrophones, which are basically just underwater microphones. Data acquisition is currently done with a separate computer with integrated microcontroller.

To reduce lag, the audio interface should be moved closer to the robot's main computer. This could be done by implementing audio data acquisition (recording) via a dedicated fast microcontroller (like a Raspberry Pi Pico) on a fast computer bus, or using some dedicated high frequency audio interface. The thesis would be about finding a good way to transfer high frequency (200 kHz) multi-channel audio to a robot's computer (from nVidia Jetson series).

What will you learn?

- How an underwater robot works
- How robots localize using audio
- Interfacing between different hardware components

Why is this important?

Underwater robots could potentially make faster and better navigational decisions autonomously when the audio data is available with minimal lag.

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