

Thesis Topic: A Self-Cleaning System for Underwater Flow Sensors

What's this about?

At the TalTech Centre for Biorobotics, we've built a special sensor called the *Hydromast* ([link](#)). Inspired by how fish sense water movement, it can measure currents and waves in rivers, harbours, and along coastlines. These sensors are already being used in Estonia and abroad.

But there's a catch: when placed underwater for a long time, they often get clogged with dirt, seaweed, or other debris. This not only messes up their readings but can also damage the sensors. Your job would be to design a way for the Hydromast to *clean itself* whenever this happens.



Figure 1. Hydromast device and an example of debris on the device

What will you learn?

- How to design clever mechanical solutions
- Hands-on fieldwork and testing in real water environments
- Signal processing (making sense of the sensor's data)
- Planning and running experiments like a professional engineer

Why is this important?

A self-cleaning Hydromast would need less frequent maintenance, making it cheaper and more reliable for long-term use. It could even prevent damage to the device. In other words, your work could directly improve a product that's already out in the world and is being used for water monitoring in many places.

Requirements: experience with CAD, signal processing skills, Python

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