

# Thesis Topic: Flapping sound modeling with machine learning for underwater robotics

## What's this about?

At the TalTech Centre for Biorobotics, we've built a special underwater robot called the UCAT ([link](#)). One of the advantages of this robot is more silent than basic thruster actuated robots.

However, the flapping motion is not optimized for the less sound noise due to the modeling difficulties. To address this, we implemented an experimental data driven machine learning model to predict the noise generated by the robot's flapping motion.

## Requirements

- Basic experience with sensors and communication
- C++ and Python skills
- Linux experience
- Fundamental knowledge of machine learning

## What will you learn?

- Real time system development skill for data collection
- Machine learning model development skills for sound processing
- Loss-function design to evaluate sound noise
- Signal processing skills
- Robot locomotion optimization (bonus)

## Why is this important?

The previous study indicates the possibility of the sound impact for the real animal, for example salmon in fish farms ([paper](#)). Developing silent robots possibly lead to animal friendly robots.

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