

Statistical Analysis of plankton in Swiss lakes (with help of the Planktoscope)

Type of the project

Bachelor project (SV)

Professor

TBD

Supervisor

Vadim Paccaud

Contact person at Sailowtech

Vadim Paccaud

Student

TBD

Context

The Planktoscope is an open-source microscope for observing and identifying plankton kept in water samples. Sailowtech collected plankton samples from Lake Geneva and several other Swiss lakes, at different depths in the water column. The Planktoscope will be used to image the organisms. The software associated with the Planktoscope allows the images to be segmented to isolate each plankton, and the EcoTaxa platform then takes care of their taxonomic identification. If all the metadata from the sampling is recorded correctly, it becomes possible to estimate the density of a given species in the sampled area. The ultimate goal is to analyze statistics on the vertical distribution of plankton, i.e., to understand how different species are distributed according to depth.

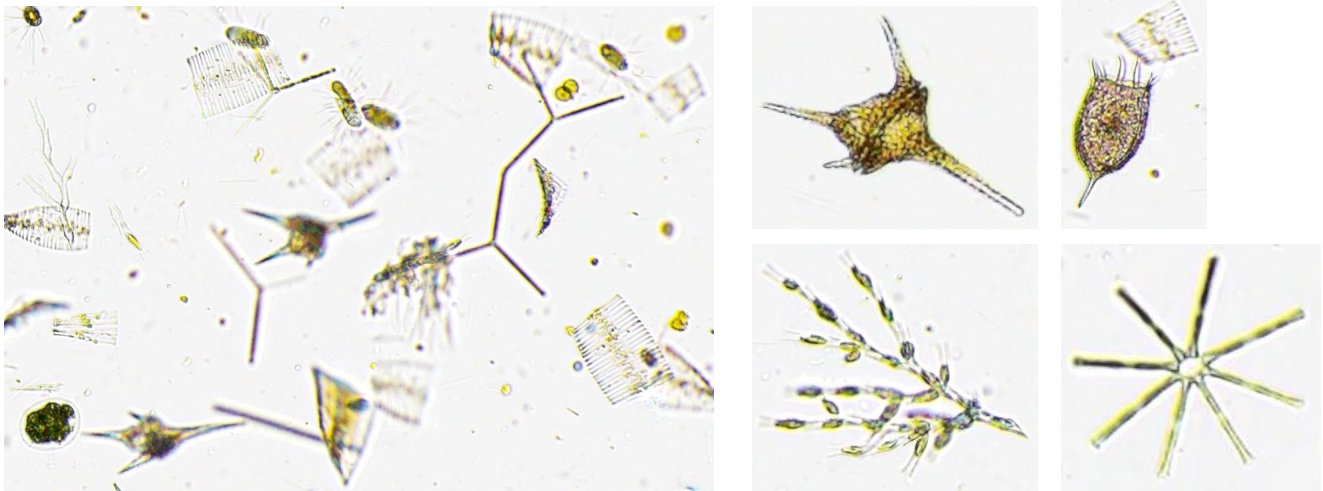


Project description

Your main tasks will consist of:

- **Formulating hypotheses** on how plankton distribution is changing, both in terms of quantity and species composition.
- **Developing a sampling protocol**, both geographical and temporal, to test these hypotheses (choice of lakes, depths, dates, etc.).
- **Analyzing the samples** using the Planktoscope and an image segmentation tool to isolate each individual.
- **Performing statistical analysis** based on the identifications made by EcoTaxa.

The tool, based on a Raspberry Pi 4 and a Raspberry camera, can obtain images of plankton smaller than 200um. Here are some examples of images of phytoplankton and zooplankton obtained with the Planktoscope:



Delivrables

1. Final report with the analysis approach and test results
2. Mid-semester and final presentation of the project to the Sailowtech team
3. One-page A4 document on general operation that can be used for interventions, for example, or by other Sailowtech members

Documentation

- <https://www.planktoscope.org/>
- <https://ecotaxa.obs-vlfr.fr/register>
- Documentation of v2.6 of the Planktoscope

Interactions with Sailowtech

The aim of this project is to establish a robust database on plankton communities present in Swiss lakes. Consequently, there will be several meetings with Sailowtech to monitor progress. Finally, you will be automatically registered as a member of Sailowtech, and will therefore be able to participate in various activities and expeditions.

Contact

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