

Post-Doctoral position

Laboratory I3S, Sophia Antipolis, France

Title	Adaptive observation of biological environmental aquatic fields using a robotic surface vehicle
Contact	João Rendas (rendas@i3s.unice.fr)
Duration	12 months (possibility of extension for a second year) — available to candidates of all nationalities
Salary	about € 2110/month (netto)

Objective This Post-doctoral position is aimed at providing support for the definition and implementation of adaptive observation strategies in the context of the European project DRONIC (January/2014 – June/2016).

DRONIC's goal is to develop an innovative monitoring and treatment system for lakes and inland water reservoirs used for drinking water production. The system will be able to localize hotspots of toxic blue-green algae blooms and apply treatment only to the part of the lake where the harmful algae bloom is present, minimising thus ecological impact in the healthy regions.

The system is composed of two unmanned surface vehicles, one able to detect and map algae blooms, and the other equipped with an ultrasonic device able to kill the toxic algae. Due to wind or water flow direction and local variations in temperature, nutrients and depths, algae concentration is typically highly concentrated, as the example of the map below shows.



The recruited researcher is expected to provide support at several distinct levels of the system definition and implementation. Work during the 12 months will be concentrated on:

- Definition of adaptive observation strategies (the core task)
- Participation in the definition of the overall mission control (in particular in what concerns coordination of the two vehicles)

In the second year, the following follow-up tasks will be carried out in parallel with necessary redesigns/adjustments of the subsystems defined in the first year, in close collaboration with other partners of the project:

- Integration of algae sensors (from the point of view of the exploitation of their information for mapping purposes) and the ultra-sound actuator (with the goal of guaranteeing a given target algae abatement)
- Participation in the design of the user interface (with a focus on logged data viewer and implementation of decision support components)
- Participation in the final test and validation of the system components in the integrated DRONIC system.

Required expertise Candidates with a strong background in robotics and statistics (familiarity with probabilistic SLAM techniques will be given a preference) are targeted. Moreover, they are expected to be proficient programmers, both in mathematic oriented languages like MATLAB/Mathematica, and in C/C++. Familiarity with design and implementation of reactive (event-based) system is a plus.