



European Project Semester

PROJECT OUTLINE

Project dates: September - December 2019

Title: Study and requirements definition of mobile underwater robotics solution for autonomous cleaning of artificial water storage

Project activity areas:

Automatic cleaning, robotics design, energy management, ecology

Keywords: Autonomous Mobile robot, control theory, design, mechatronics.

Tutor's name and coordinates

Client – End-user: **ENIT**
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Project origin

Research, innovation

Project technical background:

Artificial water storage is often used as a supplementary storage in addition to a groundwater. However, this storage requires a regular cleaning to keep water in a good condition and quality and to avoid algae blooms. Usually, human workers make this cleaning manually, when the storage became empty, which represents tedious tasks. Therefore, an automatic and autonomous cleaning based on mobile underwater robotics can be explored to maintain a continuous cleaning over time.



Figure 1: Underwater robot used for cleaning seabed

The purpose of the current project is to study and define requirements for applying this robotic solution. Several steps should be explored to reach that purpose. First of all, many issues, related to robotics use in these conditions, should be addressed (underwater condition and sealing, energy autonomy, navigation strategies, waste management, ... etc).

Then, based on objective criteria, the member of project should compare and establish a chosen solution that satisfies the requirements. Finally, a design of a robotics solution, which includes the actuation part and cleaning and waste management tools, should be proposed.

This study should take into account the cost aspect of the solution and the existing spare parts.

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Studied topics:

- Definition of issues related to robotic-based cleaning of water storage
- Definition of requirements and technical specifications of autonomous robotics solution
- Explore the existing solution in the market and compare them, with respect to our requirements and objectives
- Design the robotics solution by establishing all functional parts
- Explore and establish list of the existing spare parts, and estimate the cost and benefits of this solution