# IPS6 – Computer Vision for Anti-Fouling Assessment

Background

Fouling is a big and persistent problem in the marine sector, where small organisms, such as mussels and algae, will attach themselves to any suitable surface. This is especially a problem for e.g. ships and wave energy generators as they will be less

efficient due to the increased friction. Fouling can also become so severe that it might damage the surface. Anti-fouling attempts to prevent this issue by making the surface less desirable for the different organisms. This can be achieved either through treatment with, for example, paint or by designing the surface to have anti-fouling properties from the start. Common for all approaches of anti-fouling is the need to evaluate and document their performance in terms of preventing fouling. The industry standard is to apply anti-fouling treatments to small sheets of metal, which are then exposed to fouling by submerging them in the sea for months. These sheets are inspected monthly by briefly extracting them from the sea and capturing images of their current state. The images are then manually inspected by an expert and rated on a scale (1-5) in terms of different parameters. This is a tiresome and unreliable process that needs to be automated.
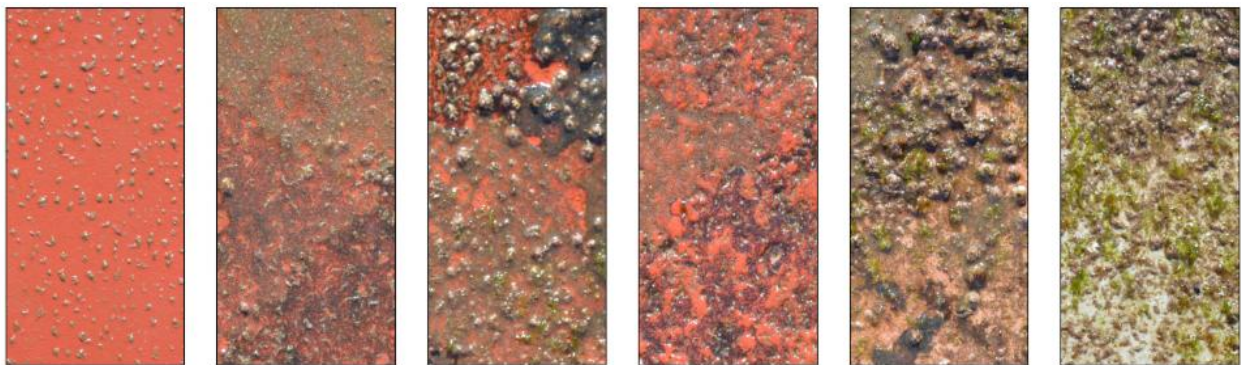
Images of small sheets of metal containing different levels of fouling.

Objective of project

The goal of this project is to automate the analysis of the images containing the sheets treated with anti-fouling. By automating the process, it would be possible to assess much more frequently (weekly, daily or even hourly). Furthermore, an automatic approach could use a continuous scale (regression) instead of the fixed levels on a scale (classification). It

might even be possible to do the assessment in-situ, i.e. underwater, which would be beneficial as removing the sheets from the water could affect some fouling organisms. Concretely, the project will involve design, implementation and testing of one or more computer vision algorithms for anti-fouling assessment.

Data and Materials

We currently have a dataset with images of sheets across 6 months and some underwater video. More data can be obtained from our collaborator, but a part of the project can also be to capture new data using our equipment (cameras and lights) above or under the water.

Collaborator

RISE (Research Institutes of Sweden).

https://www.ri.se/en

As part of the project we plan a trip to visit RISE.

Contact: Malte Pedersen (mape@aau.create.dk)