Underwater robot vision

Introduction to Fleet Cleaner

Figure 1 The Fleet Cleaner robot cleaning a ship

Fleet Cleaner develops and deploys robots for ship hull cleanings. We are an innovative technical company based in Delft. With our unique robot we offer the most complete solution for ship hull cleanings on the market, available in all Dutch seaports. The Fleet Cleaner robot removes fouling from a ship's hull, thereby increasing fuel efficiency dramatically and reducing fuel costs. The cleaning is performed during loading and unloading in port; resulting in no down-time for the vessel. The fouling that is removed from the vessel is captured and filtered by our state-of-the-art filtering system aboard our support vessel. This is the reason that Fleet Cleaner is one of only a few companies licensed to perform hull cleanings in Dutch ports.

Research objectives

A key element of the cleaning robot are the three camera's. They provide the human operator of the robot with visual feedback on the cleaning quality, and they assist the operator in navigating the robot. The camera images are also used in an extensive hull cleaning report which presents the cleaning results and the current hull status to our costumer. These images are manually taken by the operator. The fouling and coating status in these images is assessed and classified by the operator. Based on this assessment, an overview can be made on the status of the total vessel. However, since this assessment is subjective and since we work with many operators on one job, these results are not always consistent. To improve the consistency and to get closer to our goal of a fully automated robot, Fleet Cleaner is working on automating the capturing and classifying of images. Therefore we are looking for interns who are interested in one or more of the following topics:

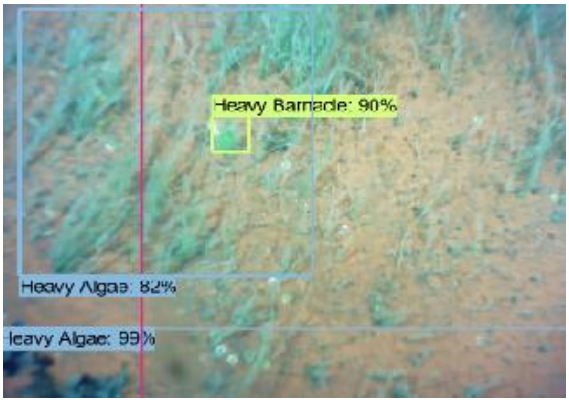

Figure 2 Automated fouling classification

- Real-time assessment of the video stream to determine, and potentially improve, the quality of images.
- Automated capturing of images based on the quality assessment, location of the robot, and amount of images per ship section that were already taken.
- Automated assessment of the fouling status and hull status on an image using deep learning neural networks.

We are looking for a talented and enthusiastic MSc student, preferably with a background in computer vision, image processing or related engineering fields. We offer the following:

- 3-12 months thesis assignment or internship at Fleet Cleaner (in Delft)
- Actual implementation and testing of your work in a real-world application
- Working in an innovative company
- Working together in a young, enthusiastic and multidisciplinary team
- An appropriate internship allowance

Fleet Cleaner

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