

3D navigation on a ship's unknown hull surface

Introduction to Fleet Cleaner

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.



Figure 1 The Fleet Cleaner robot cleaning a ship

Research objectives

During a cleaning operation our robot is controlled by a human operator who navigates on the hull of a ship. The operator is assisted by the Robot Tracking System (RTS), this system uses plans of the ship and sensors on the robot to determine the current position and to record the previous path of the robot. These plans of the ship are always 2 dimensional, 3 dimensional models do not exist or are not provided. However, to improve the accuracy of the RTS, Fleet Cleaner would like to extend the system to a 3D system using generic ship models that can be altered to the known dimensions of the ship. Therefore we are looking for interns who are interested in one or more of the following topics:

- Simultaneous Localisation And Mapping based on sensor inputs
- Determining/constructing a set of adaptable generic ship models with which most sea going vessels can be represented
- Estimating or measuring the accuracy of the old 2D and new 3D RTS system

We are looking for a talented and enthusiastic MSc student, preferably with a background in maritime engineering, control engineering, robotics 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