Project Proposal: Underwater Robot for Fish Farms

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Abstract

1 Wider Goals

This project aims to be part of wider work towards a prototype robotic platform for inspecting and cleaning nets underwater on commercial fish farms. Specifically, this robotic platform would be able to;

1. move autonomously about the net,
2. perform net inspection tasks,
3. clean the net of fouling, and
4. monitor fish.

The timescale of this project is insufficient to tackle all of these problems and so the second has been chosen as the main aim of this project, with some brief discussion of the mechanism of movement about the net as such as it impacts upon the main aim.

2 Aims and Objectives

As discussed this project will concentrate the performance of net inspection tasks of an underwater net cleaning robotic platform. The three aims of these inspection tasks, and the project objectives for each, are:

1. Identify damage to the net.
    - Study image processing techniques for locating a net within an underwater image.
    - Design an algorithm for detecting damage to the net.
2. Identify and quantify biofouling on the net.
    - Study methods of identifying biofouling.
    - Study methods of quantifying biofouling.

- Create software to identify biofouling within the image, and quantify the magnitude.

3. Recognise specific species of biofouling on the net.
    - Study visual differences between types of biofouling, with emphasis on more harmful types.
    - Create software to recognise different species, specifically warning if recognise harmful species.

All these objectives will be tested against images from fish farms and real net in a tank, where the levels of biofouling and the quality of the water will be varied to test performance.

3 Motivation

4 Literature Review

5 Risk Register

6 Gantt Chart

References