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Simulation of a hanging ROV for seabed plastic pickup

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ABSTRACT

The project Plan Sea is a student project etc. etc.

A non-buoyant ROV is designed to hang from a USV via a cable. The ROV will pick up seafloor litter. This becomes a coupled system. This project and report has had the focus of making a simulator for the coupled system for producing an environment in which rapid prototyping of a control system is possible.

Write an abstract/summary of your thesis, and state your main findings here.

A summary should be included in both English and any second language, if this is applicable, regardless if the thesis is written in English or in your preferred language. These should be on separate pages, the English version first.

CONTENTS

CHAPTER

ONE

INTRODUCTION

1.1 The Plan Sea Project

- Seafloor litter
- little study on how to deal with it
- harmful to humans and the environment
- need a solution

1.1.1 The proposed solution

- Surface vessel with ROV gripper
- basket solution
- operational criteria (weather etc.)
- possible future expansion
- The need for control systems

1.2 Control systems

1.2.1 Considerations because of a coupled system

1.2.2 The need for rapid prototyping

CHAPTER

TWO

THEORY

2.1 Literature review/State of the art

- Little specifically helpful literature
- Some help from deep sea lifting and ROV simulation papers
-

2.2 Control theory?

Basic control theory? ?????

CHAPTER

THREE

METHODS

3.1 AGX

- Describe use as simulation framework
- Describe sim setup
- Discuss alternative solutions (make your own, do numerical analysis)
- Hull and ROV shape can be exchanged, allowing for greater flexibility in a future system
- Can be used to scale things like winch strength/responsivity or cable elasticity

3.1.1 Capabilities and limitations

3.2 ROS2

- Use for simulation and IRL
- assists in rapid prototyping as sim or hardware can be interchanged and the control system is agnostic to it

3.2.1 Describe ROS setup with nodes used etc.

CHAPTER

FOUR

RESULTS

4.1 Simulation results

4.2 Control system results

CHAPTER

FIVE

DISCUSSION

5.1 Useful as rapid prototyping tool?

5.1.1 Ease of use

5.2 Future applicability

5.2.1 IRL testing proposal

Master thesis etc.

CHAPTER

SIX

CONCLUSIONS

Conclusion