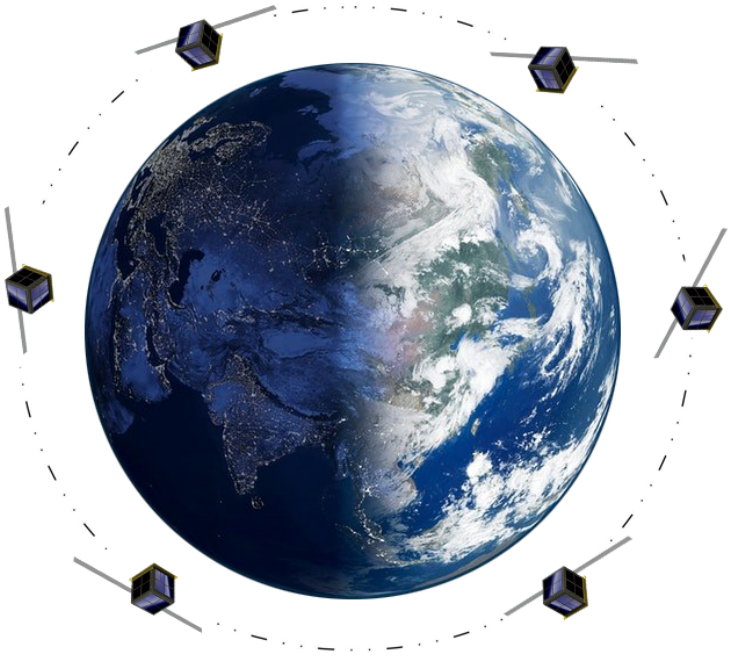
name



Group 18gr931

Aalborg University
Control & Automation
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AALBORG UNIVERSITY
STUDENT REPORT

10th Semester, Project

School of Information and

Communication Technologies

Control and Automation

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en.aau.dk/education/master/control-automation

Title:
name

Theme:
Complex systems

Project Period:
P10, Fall 2018
01/09/2018 - 20/12/2018

Project Group:
931

Participants:
-
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Supervisors:
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Pages:
Appendices: 2 (4 pages)
Attached: 1 zip file
Concluded: 20/12/2018

Synopsis

Preface

This report has been written by group 931 on third semester in Control and Automation on Aalborg University. References made before a full stop regards the sentence and reference after full stop regards the paragraph. Quotes are inside quotations marks and in cursive. Attached to report is a zip file with:

- The MATLAB code
- Simulink model

Report by:

Nikolaos Biniakos

Alexandru-Cosmin Nicolae

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A name **8**

B name **9**

1 | Introduction

1.1 Problem statement

1.2 Use-case

2 | System Description

3 | Requirements

Based on the use-case introduced and the available system a set of requirements are formulated.

System requirements

1. **The formation shall be able to maintain a given angle within 45°.**

   The system of satellites shall be able to create a formation around the Earth where the angle between them will be equal.

2. **Each satellite shall be able to change its orientation.**

   The satellites shall be able to rotate using momentum wheels to point towards the desired direction in order to apply the expected drag force.

4 | Angle control between satellites

5 | Attitude control

6 | Acceptance test

The system is tested to see if it fulfils the requirements put up (*chapter 3*).

1. The formation shall be able to maintain a given angle within 45°.

The results from global algorithm illustrated in *figure* **??** and from distributed algorithm *figure* **??** show that the requirement is fulfilled. In both figures, it can be seen that the satellites started at the same point and in the end, they are in a flying formation where the angles between them are nearly 45°.

2. Each satellite shall be able to change its orientation.

For this requirement, a linear and nonlinear controller have been designed. The results of these two controllers are shown in *figure* **??** and in *figure* **??**, where both are performing well. The satellite is able to track a reference orientation, therefore, the requirement is fulfilled.

7 | Conclusion

A | name

B | name