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# Autonomous Robotic Lawn Mower

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Project Report  
Group 16gr515

Aalborg University  
Electronic Engineering and IT

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**AALBORG UNIVERSITY**  
STUDENT REPORT

**Electronic Engineering and IT**  
Aalborg University  
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**Title:**

Autonomous Robotic Lawn Mower

**Theme:**

Digital and Analog Systems Interacting  
with the Surroundings

**Project Period:**

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**Project Group:**

Group 16gr515

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**Abstract:**

The basis of this project is optimising the route planning aspect and perimeter delimitation of an autonomous robotic lawn mower, and trying to develop a better solution than the currently most used route technology. The general problem in this report is therefore trying to optimize the perimeter delimitation and mowing pattern aspects of the route planning. The problem and possible solutions is analysed and compared to solutions currently on the market, and simulations and construction of a prototype is used to evaluate these possible solutions. Through these simulations the planned routing algorithm developed in the project is shown to create a route with a shorter length to mow the entire lawn, than the simulation of a random route. The perimeter delimitation and drive handling of the mower is developed using DGPS. With a precision of less than 10 cm this solution is shown to be applicable.



# Preface

This report is composed by group 16gr515 during the 5th semester of Electronic Engineering and IT at Aalborg University. The general purpose of the report is the development and construction of an autonomous robotic lawn mower which is a part of the overall theme *Digital and Analog Systems Interacting with the Surroundings*.

For citation the report employs the Harvard method. If citations are not present by figures or tables, these have been made by the authors of the report. Units are indicated according to the SI standard.

This project uses the C programming standard C99, and furthermore VHDL'93 is used for programming a FPGA.

Aalborg University, February 6, 2017

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## Part I

# Analysis & Requirements





**Part II**

**Design & Construction**



## **Part III**

## **Tests**



# **Part IV**

## **Conclusions**



# Bibliography