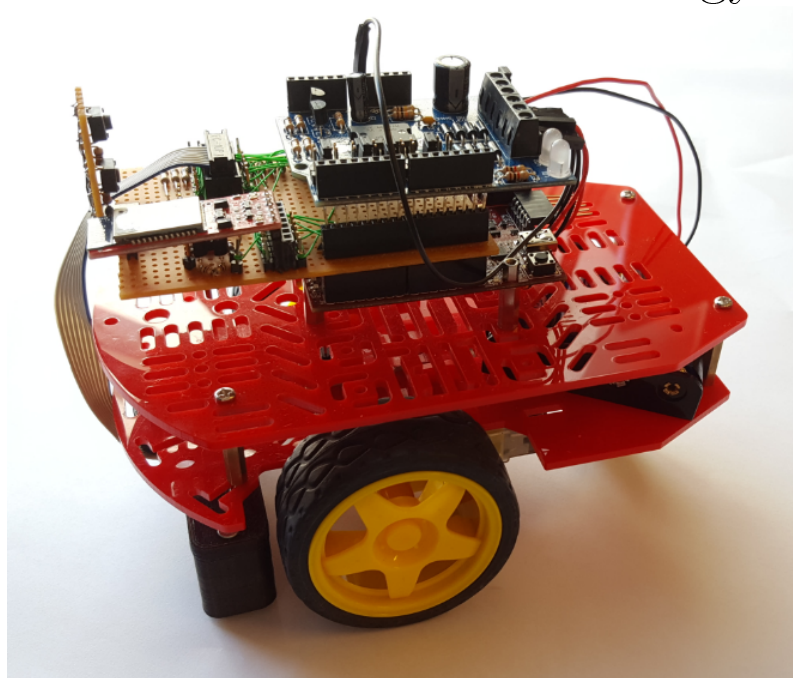


Fall Semester 2015

Line following robot

Group 2

2. Semester IT-Technology



Group members: Benjamin Nielsen - Henrik Jensen - Martin Nonboe - Nikolaj Bilgrau

Supervisor: Jesper Kristensen - Steffen Vutborg

Title:

SICK PEW PEW robot

Project Period:

3. Semester | Spring semester 2016

Projectgroup:

Group 2

Group participants:

Benjamin Nielsen

Henrik Jensen

Martin Nonboe

Nikolaj Bilgrau

Supervisors:

Jesper Kristensen

Steffen Vutborg

Pages:

Appendices:

Completed:

Preamble

This project was written by group 2, for the second semester on the IT-electronics education at university college Nordjylland, Sofiendalsvej 60. The project goal is to make a line following robot.

Benjamin Nielsen

Henrik Jensen

Martin Nonboe

Nikolaj Bilgrau

Table of Contents

1	Introduction	1
2	Analysis	2
3	Requirements specification	3
4	Hardware section	4
4.1	Hardware diagram	4
4.2	Analog-to-digital converter	4
4.3	The chipKIT Uno32 board	4
4.4	The motor shield - PKA03	4
4.5	The Bluetooth transceiver	4
5	Software section	5
5.1	Analog to digital conversion	5
5.2	PID controller	5
5.3	Pulse-width modulation	5
5.4	The interface	5
6	Test	6
6.1	Unit Testing	8
6.2	Integration Testing	8
6.3	System Testing	8
6.4	Acceptance Testing	8
7	Conclusion	9
8	Appendices	10
8.1	Group collaboration agreement	10
9	List of references	11
	List of Figures	12
	List of Tables	13
10	Software appendix	14
10.1	C code	14
10.2	C# code - interface	16
	Bibliography	17

3D print 3-Dimensional printing

Introduction 1

Analysis 2

Requirements specification 3

Beskriv section [1]

Hardware section 4

Beskrivelse af afsnit

4.1 Hardware diagram

Beskrivelse af hardware diagram

4.1.1 Sensor choice

4.1.2 Another sensor choice?

4.2 Analog-to-digital converter

ADC diagram

This products usage of ADC

4.3 The chipKIT Uno32 board

4.4 The motor shield - PKA03

4.4.1 The H bridge

4.5 The Bluetooth transceiver

Software section 5

Beskriv Software section

5.0.1 Software diagram

5.1 Analog to digital conversion

5.2 PID controller

5.2.1 Proportional control(P)

5.2.2 Integral control(I)

5.2.3 Derivative control(D)

5.2.4 Loop tuning

5.2.5 Steady-state error

5.2.6 Stability

Table manual explained

5.2.7 PID Implementation

5.3 Pulse-width modulation

5.3.1 Duty cycles

5.4 The interface

Test 6

Beskriv test section

6.1 Unit Testing

6.1.1 Sensor

Setup

Results

6.1.2 DC Motors

Setup

Results

6.1.3 H-Bridge

Equipment

Setup

Results

6.1.4 PWM

Equipment

Setup

Results

6.1.5 ADC

Equipment

Setup

Results

6.2 Integration Testing

6.2.1 PWM motor control

Equipment

Setup

Results

6.2.2 Robot to Interface communication

Equipment

Setup

Results

6.3 System Testing

Equipment

Setup

Results

Conclusion 7

Skriv en fucking Conclusion!!

Appendices 8

8.1 Group collaboration agreement

8.1.1 Contact Information

Table 8.1: Contacts

Benjamin Nielsen	Tlf: 30427645	@: yipiyuk5@gmail.com
Henrik Jensen	Tlf: 28568934	@: henrik_kort@hotmail.com
Martin Nonboe	Tlf: 23827566	@: nonsens_4@hotmail.com
Nikolaj Bilgrau	Tlf: 29802715	@: nikolajbilgrau@gmail.com

8.1.2 Workflow

8.1.3 Deadline

8.1.4 Milestones and goals

Gerne en kalender der viser dage arbejdet!

List of references 9

List of Figures

Page

List of Tables

8.1	Contacts	10
		Page

Software appendix 10

10.1 C code

main.c:

ADC.c:

10.2 C# code - interface

Bibliography

- [1] placeholderAuthor. *placeholderTitle*. 2016. URL: <http://www.ucn.dk>.