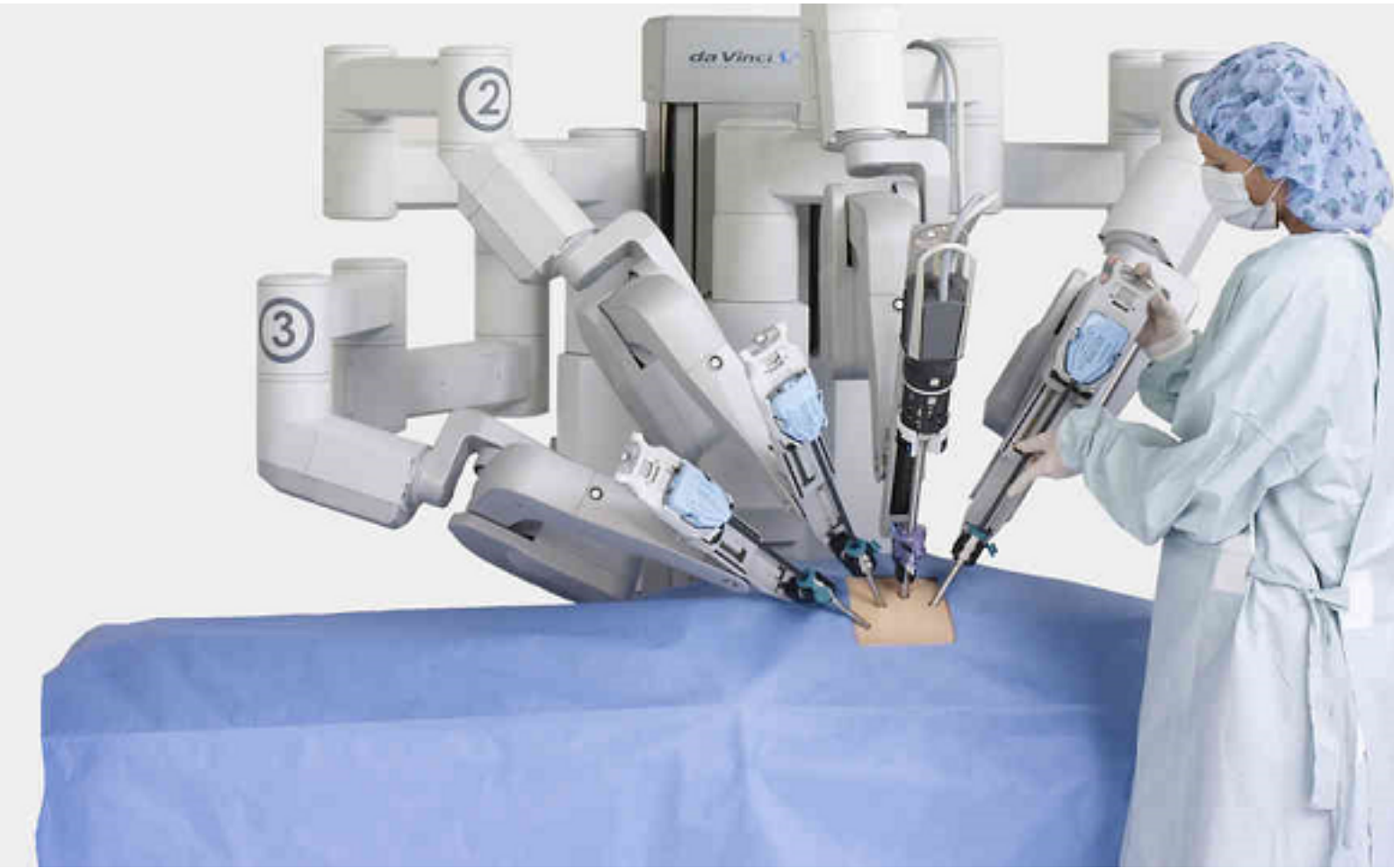


Da Vinci Surgical Robot Automation

To ensure a better world and to acquire welfare for all poor children



SCHOOL OF INFORMATION AND COMMUNICATION TECHNOLOGY

ELECTRONICS & IT
CONTROL AND AUTOMATION
FINAL THESIS - CA4 GR. 1032
AALBORG UNIVERSITY
MAY 27TH 2015



AALBORG UNIVERSITY
DENMARK

**School of Information and
Communication Technology**

Fredrik Bajers Vej 7
9220 Aalborg Øst
Phone 99 40 86 00
Fax 99 40 98 40
<http://www.es.aau.dk>

Title: Da Vinci Surgical Robot Automation

Master Thesis: Control & Automation

Project period: Feb. 2nd – May. 27th 2015

Project group: CA 15gr1032

Participants:

Britt Louise Jakobsen



Christian Køcks Lykkegaard



Abstract:

This will eventually become a synopsis.

Supervisors:

Prof. Rafał Wiśniewski

Postdoc. Kasper Vinther

Assist. Prof. Christoffer Sloth

Postdoc. Karl Damkjær Hansen

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Attached: 1 CD

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Preface

Most control applications are based on system models which introduce multiple variables. The theme of this semester is therefore *Multivariable Control Systems*. The level is a 4th semester project rated to 30 ECTS-points within the graduate program at Control and Automation at Aalborg University.

The target group is supervisors, students, stakeholders within the heating sector and other interested parties at the School of Information and Communication Technology at the The Faculty of Engineering and Science.

The majority of the project consists of model development and control structures of an absorption cycle heat pump used in a power plant in Sønderborg, a medium sized city in the southern part of Denmark.

Reading Guide

The project is structured in three major parts where different aspects of the project is considered in each:

- I System Analysis
- II Controller Design
- III Discussion

The System Analysis will be dealing with the basic understanding of the problem and model development and contains thereby the fundamental necessities used to state a requirement specification, which in the end results in guidelines and instructions for the controller design. The controller design contains design considerations and solutions to the issues discussed. Finally, the discussion part contains a summary, discussion and reflection regarding the obtained solutions.

A Symbol- and Acronym list, which features all acronyms used in the report, is found in the very beginning of the report. In the very end of the main report a bibliography is listed which likewise contains all references used in the report. Books are indicated with author, title, publisher, year and ISBN. Web pages are indicated with author, title and year.

Appendices are found after the main report and on an attached CD. The appendices include detailed derivations, source code, a digital version of the report and other materials which are not important for the understanding of the objective of the report.

All figures, tables and equations are referred to by the index of the appropriate chapter followed by a number indicating the number of figure, table or equation in the specific chapter. Thereby they have a unique number which is printed along with its caption (equations have no caption though).

Acknowledgements

It is the wish of the authors to express a special appreciation to..

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General Nomenclature Remarks

- The notation is..
- Well..

Introduction

- What is da Vinci?
- State of the art? (Raven)
- operate without having to remove the heart (Sloth of Rafael)

One should certainly take the risk of patient trauma when an automated surgery is conducted into account. This is seen in Therac-25. It is therefore a necessity to formally prove that the procedure is safe as seen in [Sloth and Wisniewski, 2014]

PART
I
SYSTEM ANALYSIS

Basic Concepts

Interim Conclusion

Requirement Specification

A list of the requirements is probably necessary if things should remain beautiful.

PART
II
CONTROLLER DESIGN

Control System Introduction

PART
III
DISCUSSION

Conclusion

This will hopefully become a nice conclusion.

Perspective

This will become a very nice and beautiful perspective.

Bibliography

Sloth and Wisniewski, 2014. Christoffer Sloth and Rafael Wisniewski. *Towards Safe Robotic Surgical Systems*. Automation and Control, Department of Electronic Systems, Aalborg University, 2014.

My First Appendix

MATLAB Code

Attached CD

Datasheets

MATLAB Scripts