# Fault-tolerant architecture design for flow-based biochips

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# Summary (English)

The goal of the thesis is to  $\dots$ 

# Summary (Danish)

Målet for denne afhandling er at  $\dots$ 

#### **Preface**

This thesis was prepared at DTU Compute in fulfilment of the requirements for acquiring an M.Sc. in Engineering.

The thesis deals with ...

The thesis consists of  $\dots$ 

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Morten Chabert Eskesen

# Acknowledgements

I would like to thank my....

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#### Introduction

- 1.1 Flow-based mVLSI biochips
- 1.1.1 Application areas
- 1.2 Motivation
- 1.2.1 Related work
- 1.3 Thesis Objectives and Contributions
- 1.4 Thesis Overview

2 Introduction

# Faults in Flow-Based Biochips

- 2.1 Possible Faults and Causes
- 2.2 Defects
- 2.3 Fault Modeling
- 2.4 Testing Strategy
- 2.5 Summary

System Models

6 System Models

3.1	Biochip	Architecture	Model

- 3.1.1 Component Model
- 3.1.2 Architecture Model
- 3.1.3 Fault Model
- 3.2 Biochemical Application Model
- 3.3 Application Mapping
- 3.4 Benchmarks
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Architectural Synthesis

- 4.1 Problem Formulation
- 4.2 Alternative Architecture Generation
- 4.3 Simulated Annealing Architecture Synthesis
- 4.3.1 Concept
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- 4.4 GRASP Architecture Synthesis
- 4.4.1 Concept
- 4.4.2 Implementation
- 4.5 Summary

#### **Architecture Evaluation**

- 5.1 Cost Function
- 5.2 Generation of Fault Scenarios
- 5.3 Connectivity
- 5.4 Scheduling
- 5.5 Summary

# **Experimental Evaluation**

- 6.1 Benchmarks
- 6.2 Solution Quality
- 6.3 Performance
- 6.4 Summary

# Conclusions and Future Work

- 7.1 Conclusions
- 7.2 Future Work

## Appendix A

## Stuff

This appendix is full of stuff  $\dots$ 

16 Stuff

# Bibliography