Fault-tolerant architecture design for flow-based biochips

Morten Chabert Eskesen

Kongens Lyngby 2015

Technical University of Denmark
Department of Applied Mathematics and Computer Science
Richard Petersens Plads, building 324,
2800 Kongens Lyngby, Denmark
Phone +45 4525 3031
compute@compute.dtu.dk
www.compute.dtu.dk

Summary (English)

The goal of the thesis is to ...

Summary (Danish)

Målet for denne afhandling er at ...

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 ...

Lyngby, 26-June-2015

Morten Chabert Eskesen

Acknowledgements

I would like to thank my....

Contents

Chapter 1

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

Chapter 2

Faults in Flow-Based Biochips

Chapter 3

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

3.5 Summary

Chapter 4

Architectural Synthesis

4.1 Problem Formulation

4.2 Alternative Architecture Generation

4.3 Simulated Annealing Architecture Synthesis

4.3.1 Concept

4.3.2 Design Transformations

4.3.3 Implementation

4.4 GRASP Architecture Synthesis

4.4.1 Concept

4.4.2 Implementation

4.5 Summary

Chapter 5

Architecture Evaluation

Chapter 6

Experimental Evaluation

Chapter 7

Conclusions and Future Work

7.1 Conclusions

7.2 Future Work

Appendix A

Stuff

This appendix is full of stuff ...

Bibliography