AORTAGEOMRECON SOFTWARE ASSURANCE CASES

AORTA GEOMETRY RECONSTRUCTION SOFTWARE ASSURANCE CASES

BY

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A Report

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Abstract

Assurance cases has been proven to be effective developing a real-time system software.

Another domain that requires the high standard correctness, completeness is medical software.

Throughout the development of the Aorta Geometry Reconstruction software, we implicitly listed the evidences that are essential to build our confidence in the software for assurance cases, build the artifact and the evidences simultaneously.

Finally, we present this software with the list of the evidences built for assurance cases, to show that the assurance cases can apply well on the medical software

Your Dedication

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Acknowledgements

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Contents

Abstract iii

Acknowledgements v

Notation, Definitions, and Abbreviations x

Declaration of Academic Achievement xi

1 Introduction 1

1.1 Objective 1

1.2 Background 1

1.3 Problem Statement 2

2 AortaGeomRecon Research and Development 3

2.1 Existing Methods 4

2.2 3D Slicer Extension Development 4

2.3 Segmentation Algorithm 4

2.4 GitHub and Workflows 4

2.5 Referencing 4

3 Assurance Cases and Selected Evidence for AortaGeomRecon **5**

3.1 Scope Determination 6

3.2 Assurance Case Development 6

3.3 Software Rerequirements Specification Development 6

3.4 Design Document Development 6

3.5 Test Case Development 6

3.6 Algorithm Review 6

4 Conclusion **8**

A Your Appendix **9**

B Long Tables **10**

List of Figures

List of Tables

Notation, Definitions, and Abbreviations

Notation

$A \leq B$	A is less than or equal to B

Definitions

Challenge	With respect to video games, a challenge is a set of goals presented to the player that they are tasks with completing; challenges can test a variety of player skills, including accuracy, logical reasoning, and creative problem solving

Abbreviations

AI	Artificial intelligence

Declaration of Academic Achievement

The student will declare his/her research contribution and, as appropriate, those of colleagues or other contributors to the contents of the thesis.

Chapter 1

Introduction

This chapter includes an introduction for AortaGeomRecon assurance cases project.

1.1 Objective

The main goals of this project starts with building a software that can quickly build the 3D geometry of the Aorta from CT Chest scans, while applying the assurance cases for this academic medical software. This project shows the assurance cases can indeed help build up our confidence in the medial software in general, because medical software like real-time system software, needed completeness and correctness.

1.2 Background

Aorta

Assurance cases

3D Slicer

Image Processing

1.3 Problem Statement

Build Software and Assurance cases for this software. Start with a list of Functional and Non-Functional requirements.

Chapter 2

AortaGeomRecon Research and Development

This chapter will discuss about the research and development of the AortaGeomRecon.

AortaGeomRecon stands for Aorta Geometry Reconstruction. The main objective of this software is to semi-automatically build 3D geometry of the Aorta from the patient's chest ct scans. The existing methods are often involved of extensive manual works with very complex software, with a minimum of 10 minutes of human operator, who are likely a medical domain expert.

The implementation till the date of this report can let the users who have the user characteristics described in SRS get the Aorta 3D geometry with only a few hyper-parameters and 2 minutes of execution time.

2.1 Existing Methods

There are many segmentation software available to the users, we will discuss the two main methods on two softwares.

- ITK-snap
- 3D Slicer

2.2 3D Slicer Extension Development

2.3 Segmentation Algorithm

This is a sample chapter

If you need to use quotes, type it "like this".

2.4 GitHub and Workflows

2.5 Referencing

These are some sample references to GAMYGDALA (Popescu et al., 2014) from the `references.bib` file and state effects of cognition (Hudlicka, 2002) from the `references_another.bib` file. These references are not in the same .bib file.

Chapter 3

Assurance Cases and Selected Evidence for AortaGeomRecon

3.1 Scope Determination

3.2 Assurance Case Development

3.3 Software Rerequirements Specification Development

3.4 Design Document Development

3.5 Test Case Development

3.6 Algorithm Review

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Chapter 4

Conclusion

Every thesis also needs a concluding chapter

Appendix A

Your Appendix

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Appendix B

Long Tables

This appendix demonstrates the use of a long table that spans multiple pages.

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Col A	**Col B**	**Col C**	**Col D**
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Adrian Popescu, Joost Broekens, and Maarten van Someren. 2014. GAMYGDALA: An emotion engine for games. *IEEE Transactions on Affective Computing* 5, 1 (2014), 32–44.