Documentation of Shape Analyzer

Version 1.0

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Contents

CHAPTER 1

Introduction

This LaTeX template is designed for the creation of thesis documents (bachelor, master, phd) and targets both beginner and experienced users of LaTeX. It supports all basic functionality and requirements of a technical document such as the inclusion of graphics, math, tables, references, bibliography and much more. In contrast to a standard LaTeX document this template not only loads all state of the art packages (`preamble/packages.tex`) to provide the best functions for each task, but also includes a separate document for the style/layout of the document (`preamble/style.tex`). It therefore tries to separate functionallity and layout as much as possible. And the best, everything is documented in the code and furthermore in a separate documentation file (`TemplateDocumentation.pdf`)

This document shows in **??** a general tutorial for LaTeX with links to the documentation for further tasks. You can view the underlying code in file `content/demo/latextutorial.tex` or in this document in **??**.

The code of the template itself is documented in `TemplateDocumentation.pdf`.

CHAPTER 2

Installation

ShapeAnalyzer is completely written in `C++` heavily making use of the recent `C++11` standart in the code. Moreover it builds up on the frameworks `VTK` version 6.1.0 or greater and `Qt` version 5.0 or greater for the visualization and rendering of the shapes and the creation of the graphical user interface respectively. For all matrix and vector related computations including the computation of the Laplace-Beltrami eigenvectors the libraries `Petsc` (basic linear algebra including basic solvers for linear systems) and `Slepc` (sparse eigensolver) are used. (Petsc and Slepsc - the funny dogs. This sounds like the names of funny cartoon series characters for kids.)
In order to compile *ShapeAnalyzer* it has be ensured that both, a recent `C++` compiler that fully supports the `C++11` standard (e.g. `gcc` 4.7 or newer) as well as `cmake` version greater ? is available . Furthermore all the aforementioned libraries and frameworks have to be installed.

Installation of Qt5 Since the most recent version of Qt currently (Dezember 2014) available via apt-get on Ubuntu is less than 5, it is recommended to download the most recent pre-compiled Qt5 package from the homepage of Qt: For installation just launch the installation assistant. (Hint: In case the installation file cannot be opened and executed you may have to make it executable via sudo chmod +x <filename>)

Installation of VTK As it is the case for Qt the most recent version of VTK currently (Dezember 2014) available via apt-get on Ubuntu is less than 6.1. Therefore it is recommended to compile and install VTK 6.1 or newer from source.

Installation of Petsc

Installation of Slepc asdf

Finally follow these steps to compile ShapeAnalyzer

List of Figures

List of Tables

APPENDIX A

First chapter of appendix

A.1 Parameters

Todo list