OCTSEG software manual

OCTSEG = Optical Coherence Tomography Segmentation and Evaluation GUI

# Abstract

The purpose of this document is to describe the algorithm and functionality of the OCTSEG software. This software segments the retinal layers, especially the retinal nerve fiber layer (DNFL) on OCT-volume scans. This document provides additional information to the original OCTSEG user manual.

Contents

[Abstract 1](#_Toc408496323)

[Introduction 1](#_Toc408496324)

# Introduction

OCTSEG (Optical Coherence Tomography Segmentation and Evaluation GUI) is a graphical user interface (GUI) written in MATLAB for research purpose. With this software, the retinal layers and the blood vessels of retinal OCT scans can be segmented. Tools for the manual correction of the automated segmentations are provided. The program gives segmentations or resulting thickness measurements on the retinal layers may be exported as a CSV file, which is readable by standard software (e.g. Excel).

OCTSEG software has been originally developed by Markus Mayer, Pattern Recognition Lab, University of Erlangen Nuremberg, Germany (Meyer, sd) and released in 2012. The original manual (octsegManual.txt) can be found in the same directory is this document. The algorithms used in this software are partly described in (Mayer, Hornegger, Mardin, & Tornow, 2010). The software have been modified to run on example data from AMC for the EYR4 “A flightpath for OCT imaging project” (Almasian, 2013) by Elena Ranguelova from the Netherlands eScience center (NLeSc) at the end of 2014/beginning of 2015. This version is available at the NLeSc repository, (Ranguelova, 2014), and is the subject to this document.

The software has been

# Main Features

The main features of the OCTSEG software are:

* Segmentation of circular OCT scans as well as Optic Nerve Head (ONH) centered volumes. The supported data format as Heidelberg Engineering Spectralis OCT RAW data (.vol extension)
* Segmentation of OCT data stored as image files (.tif, .pgm, .jpg) is also supported. Multiple images can be read in as volumes using user generated .list files (a text file format).
* Automated segmentation of 6 prominent retinal layers (including the inner limiting membrane, outer nerve fiber layer boundary, and retinal pigment epithelium)
* Automated segmentation of the blood vessel positions on circular scans
* Batch processing of circular scans
* Manual correction of possible segmentation errors
* Visualization of the data and the segmentation results, including enface views and thickness maps
* Export of the segmentation results to CSV text files

# References

Almasian, M. (2013, October). *A Lightpath for Optical Coherence Tomography Imaging*. Retrieved from https://blog.surfnet.nl/?p=2747

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Ranguelova, E. (2014). *OCT Segmentation*. Retrieved from https://github.com/NLeSC/OCTSegmentation