

OCTExplorer 5.0.0 (beta) User Manual

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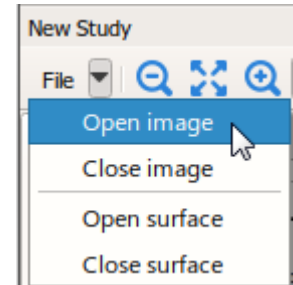
- This software is available free of charge for research use only by individuals, academic or research institutions and corporations in accordance with the terms and conditions listed in file LicenseAgreement.txt that resides in the same folder as the executable of OCTExplorer.
- For commercial use, please contact Kimberly A. Glynn (kimberly-a-glynn@uiowa.edu).

Installation

- 64-bit Microsoft Windows 7 or 10
 - Extract downloaded OCTExplorer.zip and run OCTExplorer.exe
- Apple Mac OS X (tested on 10.13.1 High Sierra)
 - Mount downloaded OCTExplorer.dmg
 - Copy OCTExplorer.app to hard drive and run it
- Memory usage varies w.r.t. OCT scan size
 - 6 GB of RAM for non-cystic Zeiss OCT scans (200 x 1024 x 200 voxels)
 - 20 GB of RAM for cystic Zeiss OCT scans (200 x 1024 x 200 voxels)

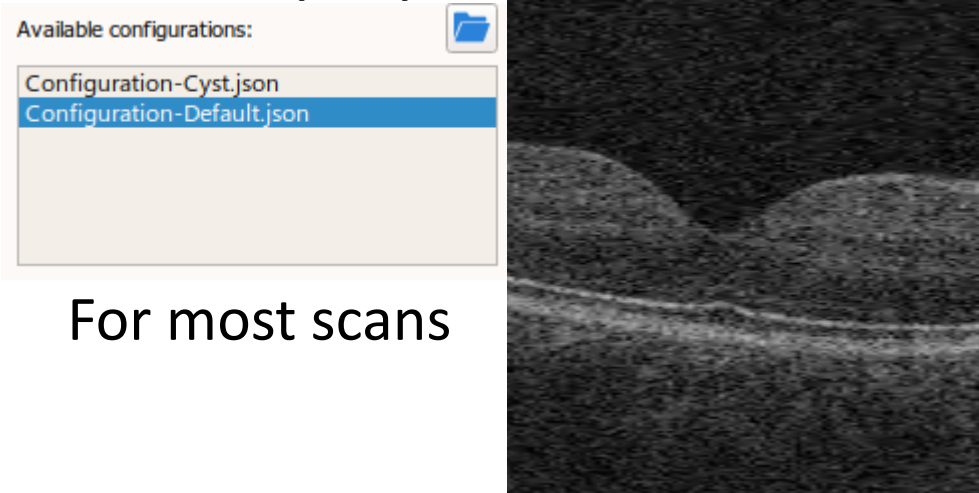
Open an OCT Scan

- Drag and drop file of OCT scan to OCTExplorer or use [File]—[Open image]
- After image is opened, surface xml file can be opened via drag and drop or [File]—[Open surface]
- Supported scanner manufactures and file extensions
 - Carl Zeiss Meditec Inc.: *.img exported from Zeiss-provided research browser
 - Topcon: *.fds
 - Heidelberg Engineering: *.vol converted from *.E2E file by Heidelberg's conversion tool
 - Optovue Inc: *.OCT
 - Bioptigen Inc: *.OCT
 - Optos plc: *.dicom
 - Canon Inc.: *.ScanParameters.dat
 - Standard MetaImage: *.mhd, *.mha
 - Standard Analyze 7.5: *.hdr
 - Standard NIfTI: *.nii, *.nii.gz

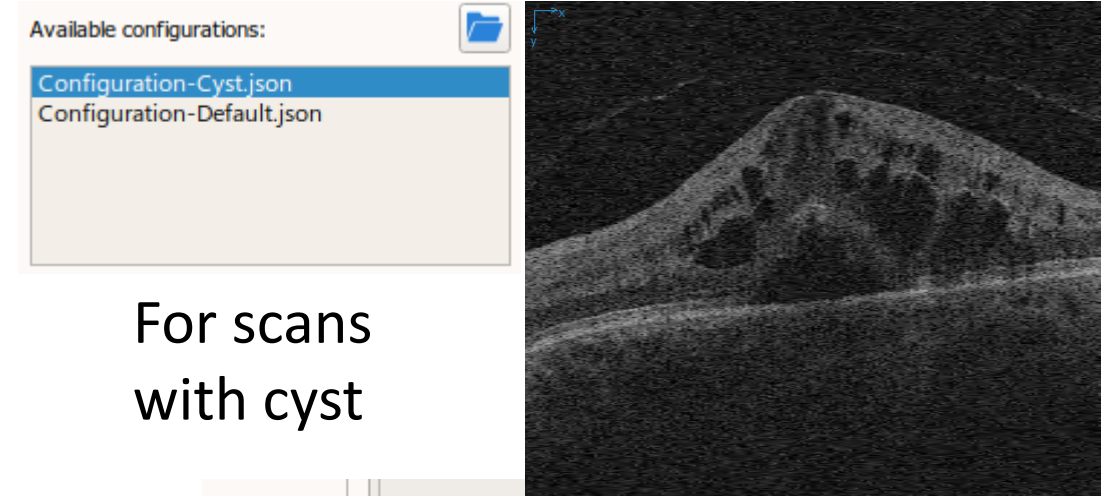


Pre-segmentation

- Choose proper configuration

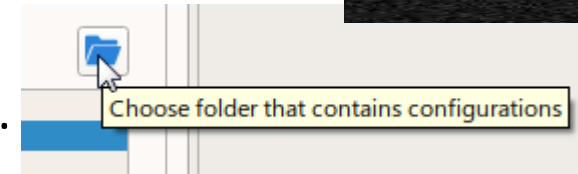


For most scans



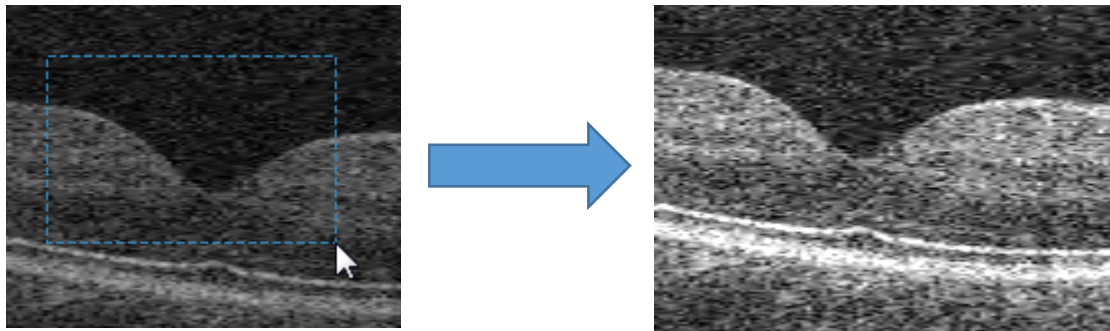
For scans
with cyst

- Can choose where to load configurations from.
- Click *Next* to start pre-segmentation
 - Identify 3 surfaces that divide image into inner and outer retinal volumes for final segmentation

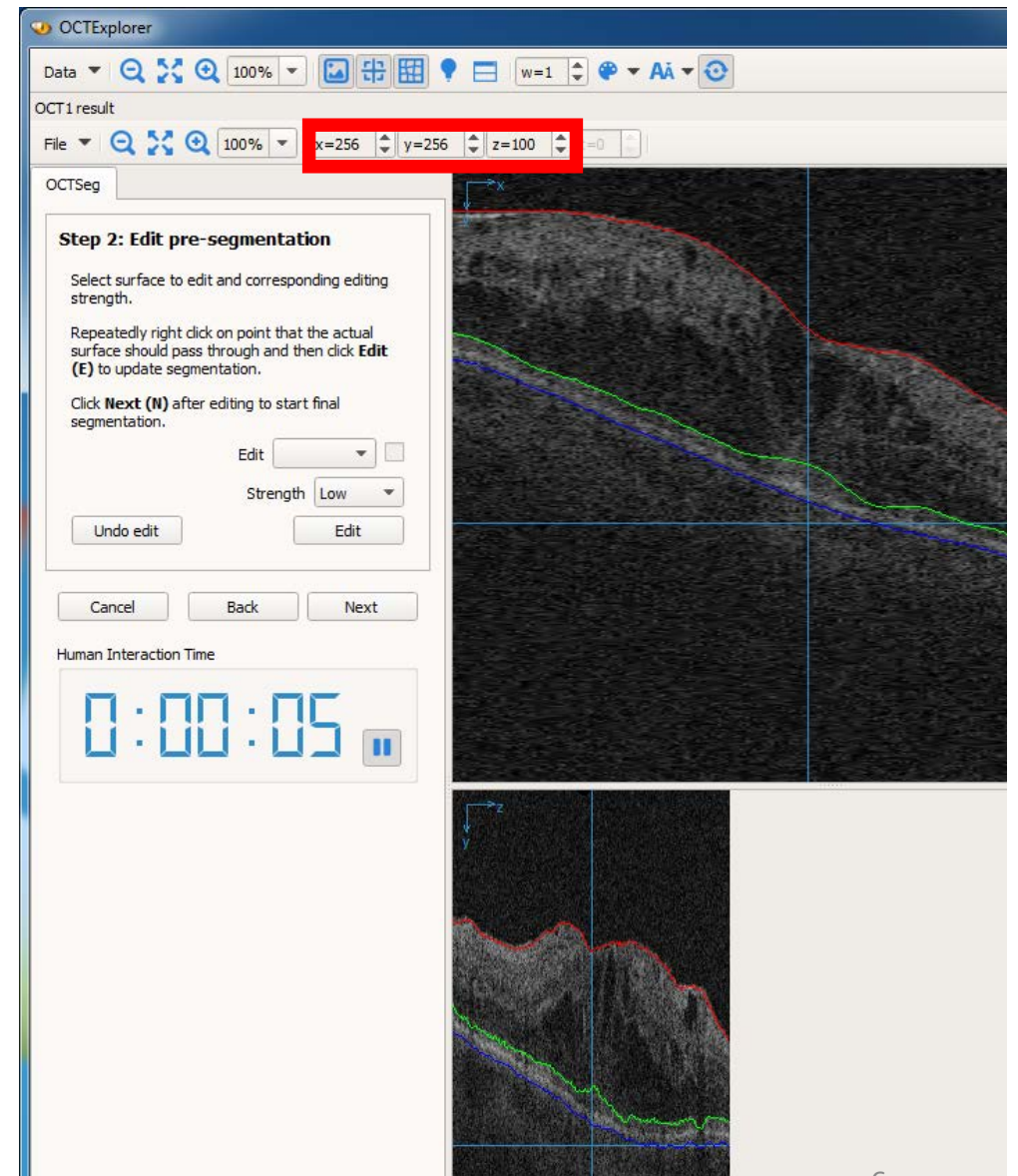
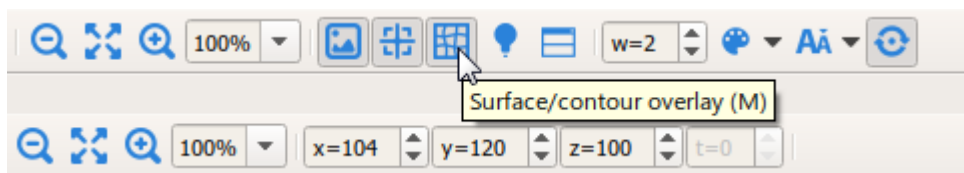


Review Segmentation Result

- Change crosshair location with
 - Left mouse click, mouse wheel, or its (x,y,z) location
- Adjust brightness and contrast
 - Draw ROI with Ctrl + left mouse drag
 - Voxels within ROI will be shown with full gray level range (0—255)

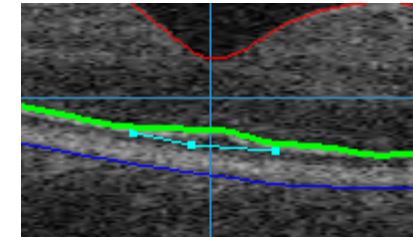
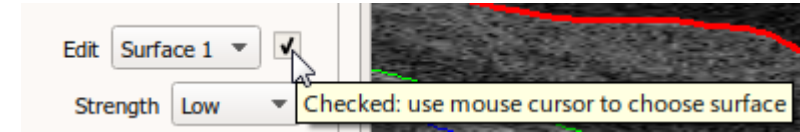


- Hover mouse cursor on toolbar icons to see tips about more visualization tools



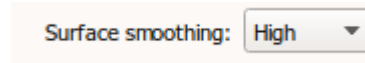
Edit Segmentation Result

- Select surface to edit
 - Use combo box, or move mouse cursor and left click on highlighted surface
 - Selected surface will be highlighted (thicker lines)
- Draw a nudge line with right clicks
 - Use *Esc* key to remove last drawn nudge point
- Select editing strength – how hard the algorithm will try to make the edited surface pass through the nudge line
- Click *Edit* to modify surface
 - Note: The nudge line can affect multiple surfaces on multiple slices
- Human interaction time
 - The program uses a timer, which can be paused, to keep record of time spent in surface editing



Edit Segmentation Result

- Surfaces of final segmentation results are smoothed along x direction
 - Can choose different smoothing strength
- Click *Back* from *Edit final segmentation* step will
 - Re-run the pre-segmentation
 - Apply existing nudge lines for pre-segmentation editing
- Click *Back* from *Edit pre-segmentation* step or click *Cancel* will
 - Go back to the first step
 - Existing nudge lines will be automatically applied when its corresponding segmentation is re-run
 - Whether the same configuration is used is NOT checked

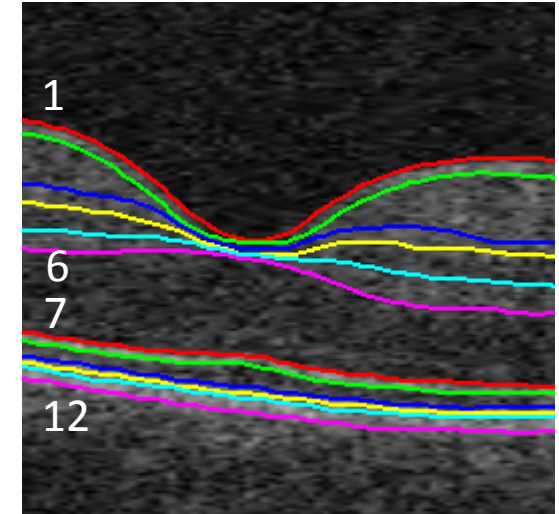


Retina Surface Names

1. ILM (ILM)
2. RNFL-GCL (RNFL-GCL)
3. GCL-IPL (GCL-IPL)
4. IPL-INL (IPL-INL)
5. INL-OPL (INL-OPL)
6. OPL-Henle fiber layer (OPL-HFL)
7. Boundary of myoid and ellipsoid of inner segments (BMEIS)
8. IS/OS junction (IS/OSJ)
9. Inner boundary of OPR (IB_OPR)
OPR: Outer segment PR/RPE complex
10. Outer boundary of OPR (OB_OPR)
11. Inner boundary of RPE (IB_RPE)
12. Outer boundary of RPE (OB_RPE)

Retina Layer Names

- 1–2: RNFL
- 2–3: GCL
- 3–4: IPL
- 4–5: INL
- 5–6: OPL
- 6–7: ONL
- 7–8: IS/OS
- 8–9: Outer segment
- 9–10: OPR
- 10–11: Subretinal virtual space
- 11–12: RPE
- 1–12: Total retina

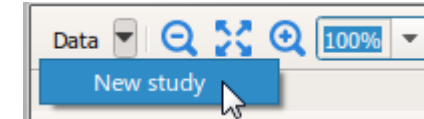


Output Files

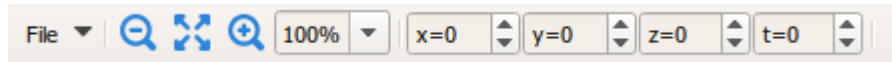
- Created in the same folder as OCT scan file xxx.*
 - Surfaces
 - xxx_Surfaces_Retina-JEI-Pre.xml: for pre-segmentation
 - xxx_Surfaces_Retina-JEI-Final.xml: for final segmentation
 - Can be loaded into OCTExplorer 3.8.0 for layer thickness analysis
 - Nudge lines
 - xxx_NudgeLines_Retina-JEI-Pre.xml: for pre-segmentation
 - xxx_NudgeLines_Retina-JEI-Final.xml: for final segmentation
 - Human interaction time (in second)
 - xxx_Time_Retina-JEI-Pre.txt: for pre-segmentation
 - xxx_Time_Retina-JEI-Final.txt: for final segmentation

Advanced Feature: multiple studies

- Can compare images or surfaces of multiple datasets side-by-side
- Use [Data]—[New study] to create a new study
- Top toolbar controls all opened studies



- Study-specific toolbar only controls its associated study



- Crosshairs on all opened studies can be synchronized

