Quick Guide

AngioTool

Installation

1. Upgrade your Java version at http://jdk7.java.net/download.html. JDK7 is required to run AngioTool.
2. Confirm that your computer is running the appropriate java version at http://www.java.com/en/download/installed.jsp. The test should confirm "You have the recommended Java installed (Version 7 Update XX).
3. Download AngioToolSetup.exe from https://ccrod.cancer.gov/confluence/display/ROB2/Download to your computer (32 and 64 bit versions available). Double click and follow the installation Wizard (it is recommended to add the AntgioTool Icon to the computer desktop).

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1. Double click on the **AngioTool** icon in your desktop or on the executable file (AngioTool.exe) located in the folder where the program was installed. The main GUI has two separate tabs: **"Analysis"** and **"Settings"**
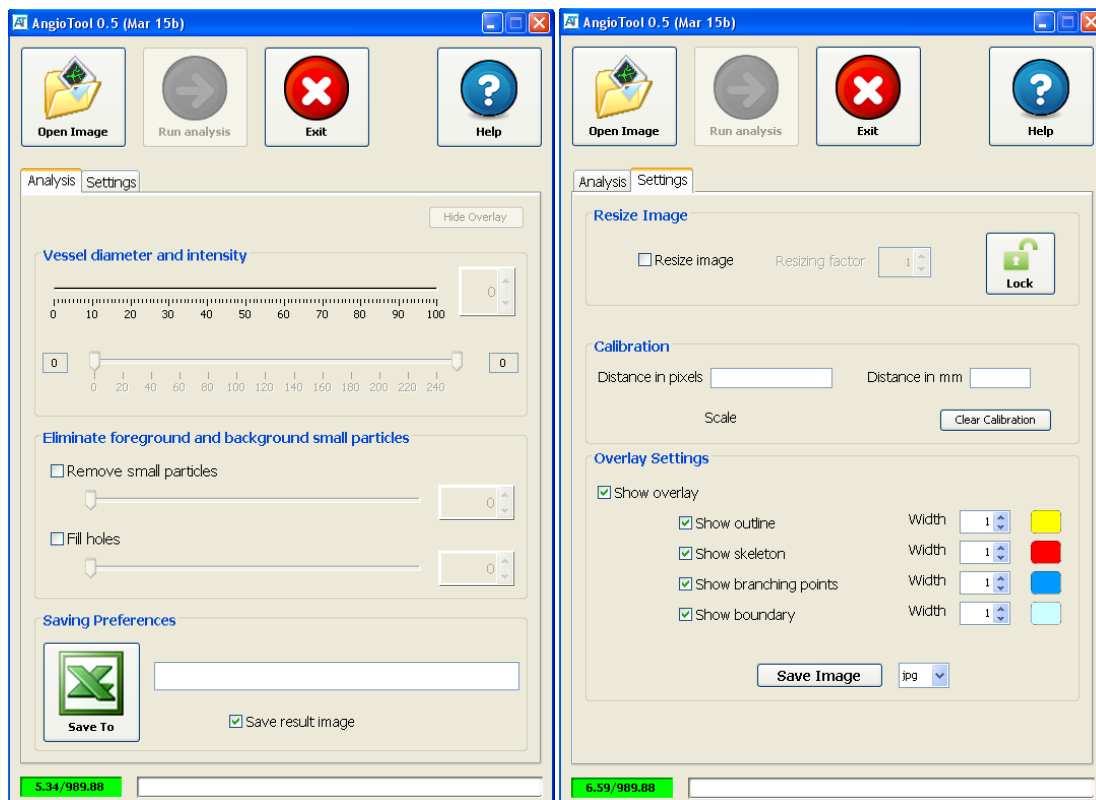
2. Open an image by clicking the **Open Image** button in the Analysis tab. AngioTool will open the image in a separate window and will perform an initial selection of vessels based on estimated parameters. The vessel selection is shown by a yellow overlay on the image. In order to tune the selection of the vessels the analysis parameters can be adjusted.
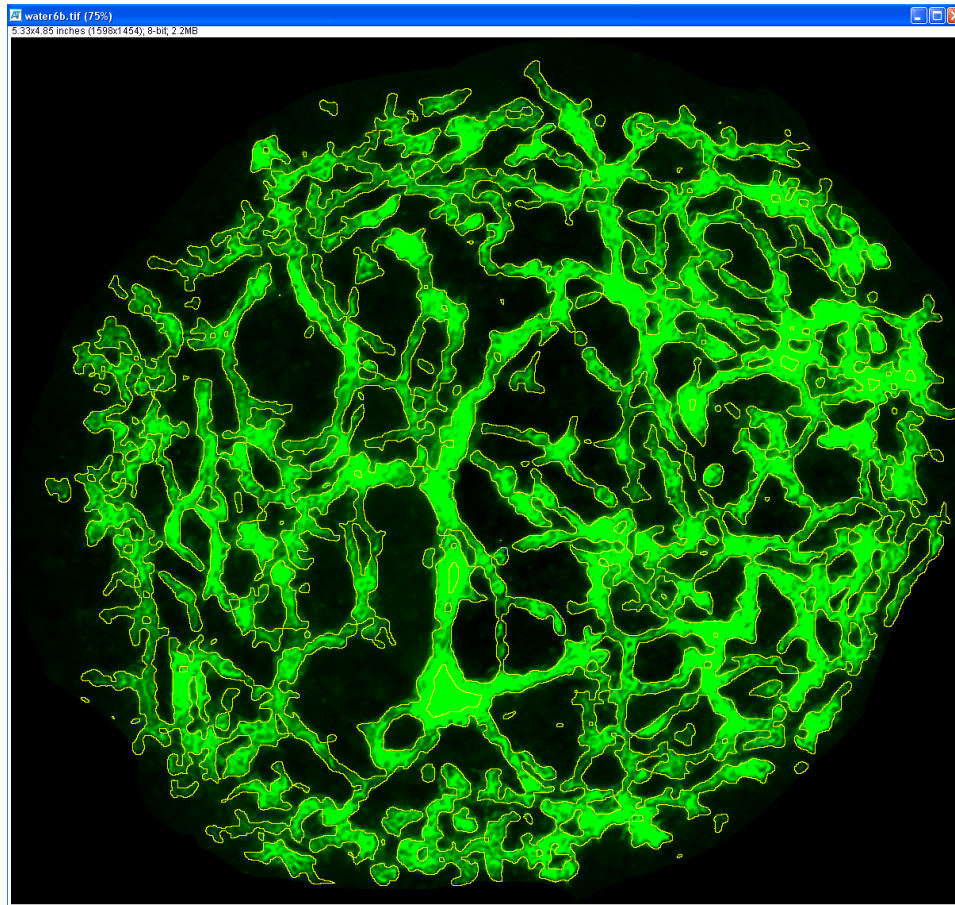
3. Adjust the **Vessel diameter** and **Vessel intensity** controls.
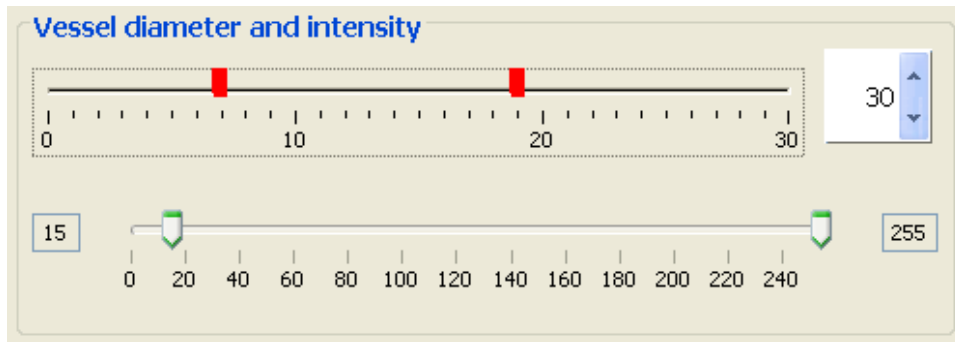
Click on the **Vessel diameter** control to select vessels based on their diameter. Selections are shown as red ticks which can be individually toggled off by clicking on them. Clicking on higher diameter values will select thicker vessels and vice versa. Multiple selections are allowed. The vessels outline will dynamically update its shape in response to the adjustments done to the controls. This enables rapid visual fine tuning of the selection. By default, this control presents the user with a broad range of possible thicknesses. However if necessary, the upper limit of this range can be dynamically modified by adjusting the spinner next to the control.

The second control, **Vessel intensity**, allows to select vessels based on their intensity. In order to detect fainter vessels drag the lower thumb to lower numbers. To eliminate nonspecific high intensity pixels from the selection lower the higher thumb.

4. Two additional controls are provided to fine tune the vessel selection.
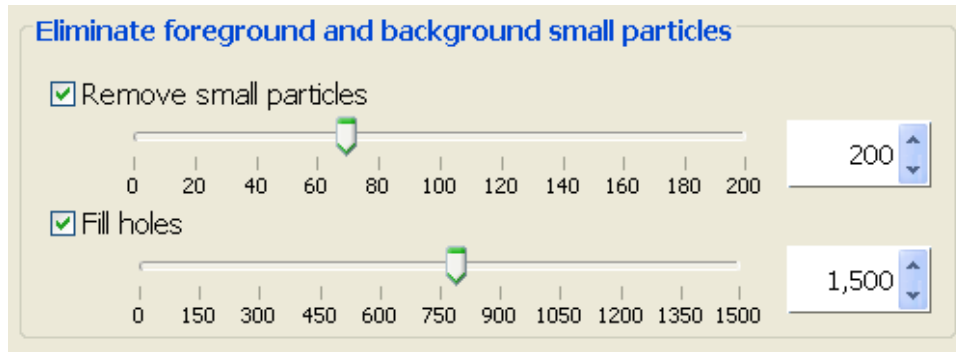
To eliminate background particles by size adjust the **Remove small particles** control. Particles smaller than the size selected in the control will be removed from the selection. To fill unselected areas inside vessels adjust the **Fill holes** control. To activate these controls click on their associated checkbox. The associated spinners can be used to dynamically modify the range of the controls. Remember to always consult the actual changes in the outline overlay of the test image.

5. The **Hide Overlay** button toggles the overlay on and off helping to evaluate the accuracy of the selection at every moment during the analysis.
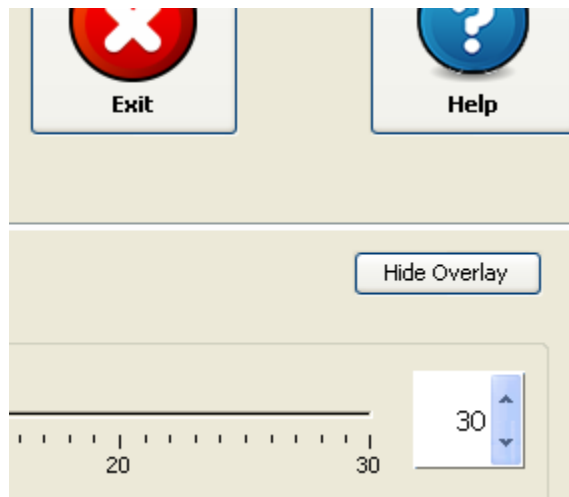
6. Click on the Excel icon in the **Saving Preferences** panel to select the file where to save the data generated by the analysis. The path of the selected file will be shown on the associated textbox. If a directory and a name are not set, an Excel file will be generated and saved with a unique name (ResultsXXXXXX.xls) in the folder where the test image is located. Click on the * Save result image * checkbox to instruct the program to save the image resulting from the analysis. By default, the resulting image will be saved to the same location where the test image is located.
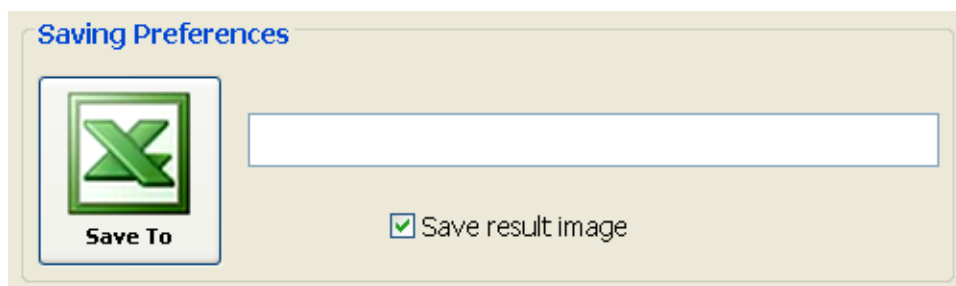
7. Once the outline overlay best matches the vessels in test image, click the **Run analysis** button to start the analysis. The progress bar at the bottom of the main GUI will update on the progress of the analysis. Once the analysis is completed the resulting overlay will show the allatois outline, the skeleton and the branching points (points in the image where there is a confluence of more than two skeleton segments).

8. Both the analysis settings and the computed parameters are written in separated blocks to the indicated Excel file. The recorded analysis settings include the date and time of the analysis, the location of the test image, and the user selected values for the controls in the **Analysis tab** and the calibration information in the **Setting tab**. Data generated in separate AngioTool sessions but written to the same Excel file are appended at the end of the file each with bold headings (red arrows).

9. The **Settings** tab provides with controls to customize the analysis and the results. Use the **Resize Image** control to downsize the test image. Resizing the test image will result in significant speedup of the analysis often with no impact on the results of the analysis. To activate this control click the **Resize Image** checkbox and use the associated spinner to enter the desired resizing factor. This control needs to be set prior to opening the test image and will lock after the image is opened. Click on the unlock/lock icon / to lock/unlock the control.

10. Use the **Calibration** control to define a correlation between pixels in the image and an alternative unit length in the sample (AngioTool uses millimeters as unit of length). To set a calibration type the length in pixels in the * Distance in pixels * box and the corresponding length in millimeters in the * Distance in mm * box. This control needs to be set before running the analysis of the image.

11. Use the **Overlay Settings** to customize the appearance (stroke width and color) of the different components of the overlay. Click on the checkboxes to show or hide the different components of the overlay and adjust the associated spinners and color boxes to customize their width and color. Use the * Save Image * button to save the resulting image after adjusting the Overlay Settings. The format of the image can be set in the associated listbox.

12. The **Help** button shows this guide.

13. Use the **Exit** button to exit AngioTool.