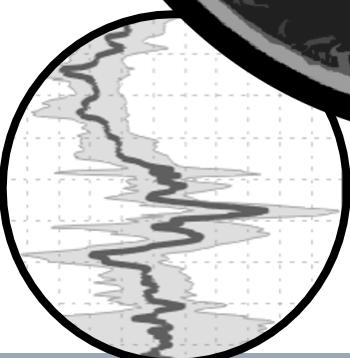




CORECT



USER GUIDE

Prepared by Yu Ting Yan
21 Dec 2020

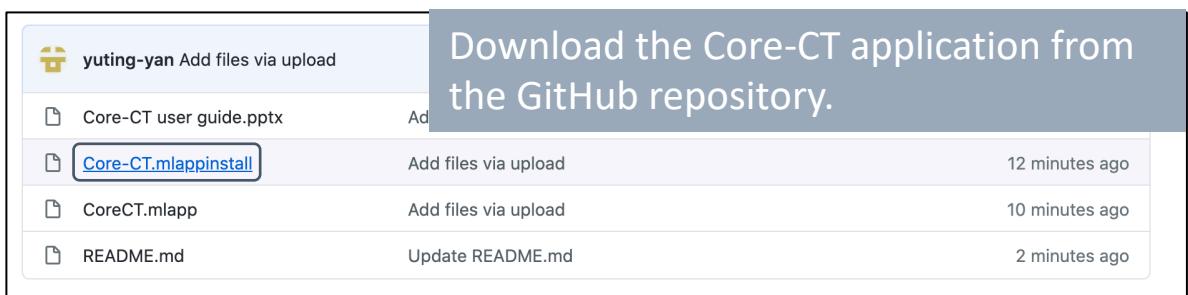
INSTALLATION

Core-CT requires Matlab 2019a and newer version.

Toolbox required:

- Image processing toolbox
- Signal processing toolbox

GitHub repository: <https://github.com/yuting-yan/Core-CT>

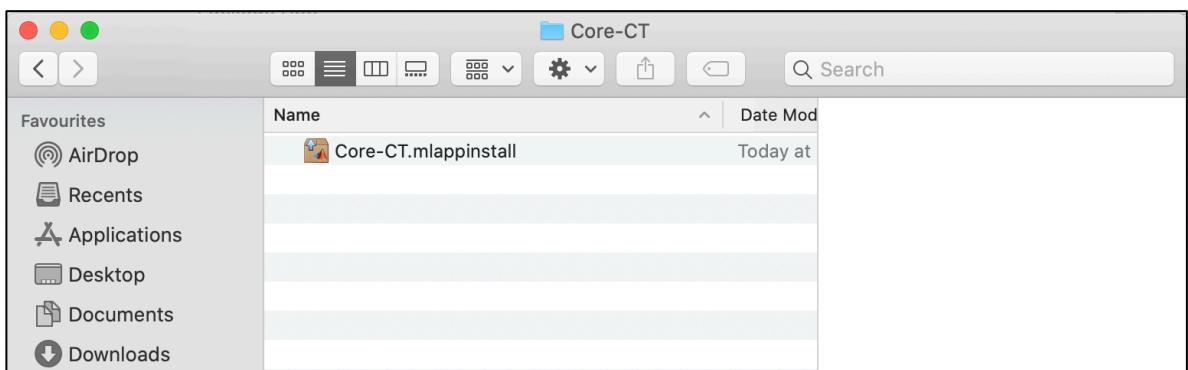


Download the Core-CT application from the GitHub repository.

The screenshot shows a GitHub repository page for "yuting-yan". The repository contains the following files:

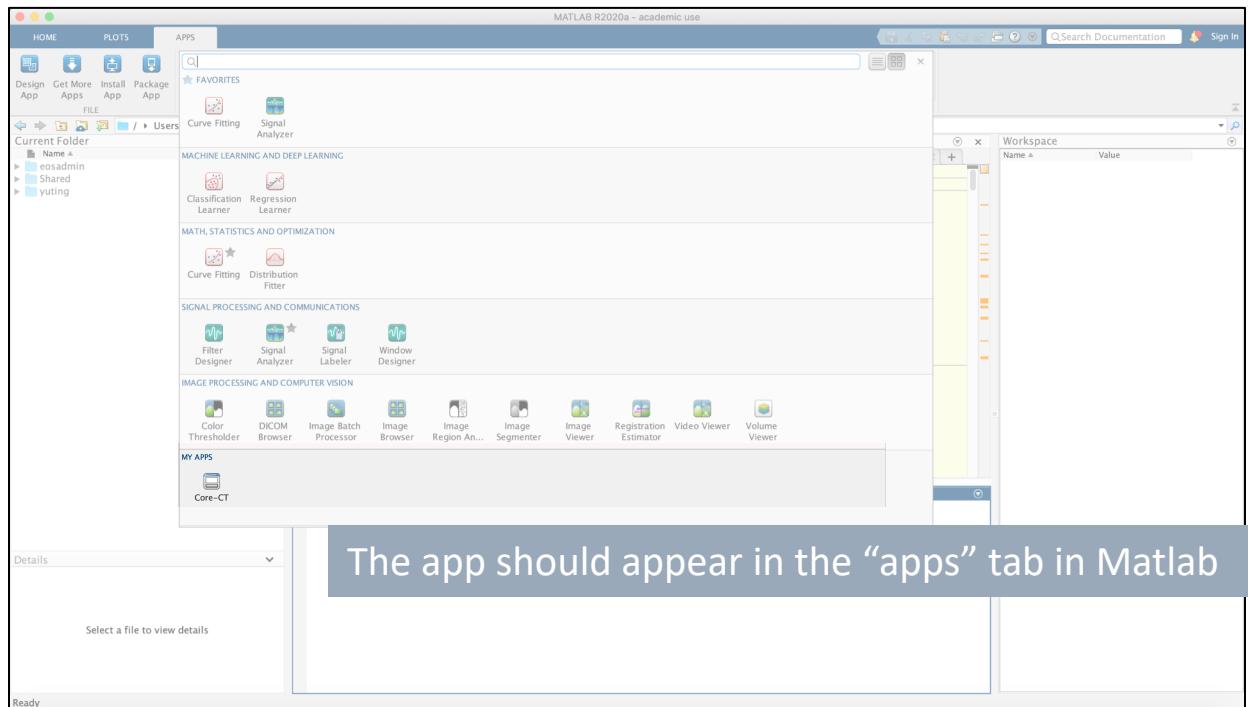
- Core-CT user guide.pptx
- Core-CT.mlappinstall
- CoreCT.mlapp
- README.md

The "Core-CT.mlappinstall" file is highlighted with a blue border.

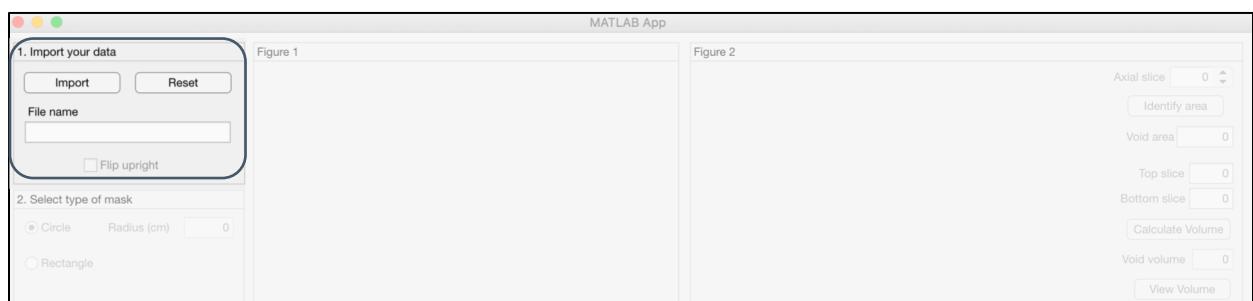


Double click on the folder and you will be prompted to install the application. Click “install”.

USING CORE-CT



A graphic user interface will launch when you click on the icon



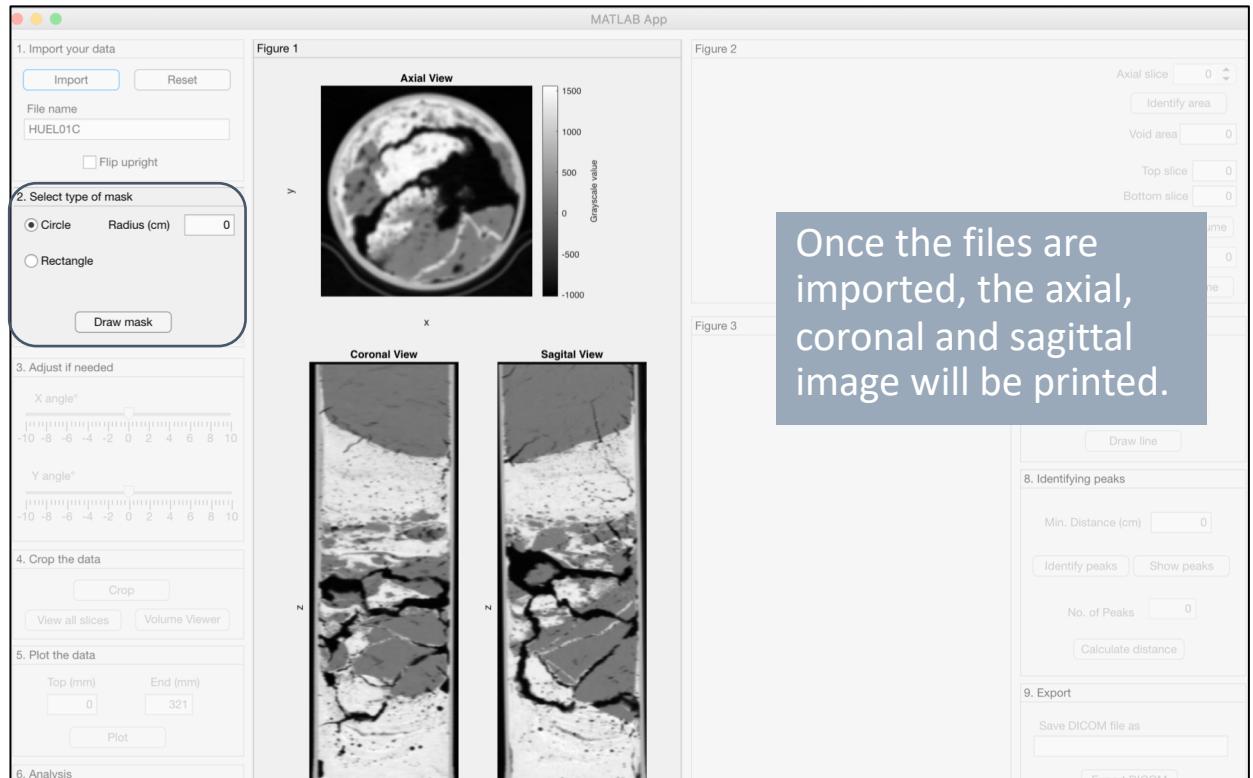
To start, import the CT images using the “import” button.

A dialog box will prompt you to choose the CT files, the folder name will be printed in the field.

If the CT images are not loaded the right way up, check the ‘Flip upright’ box to correct it.

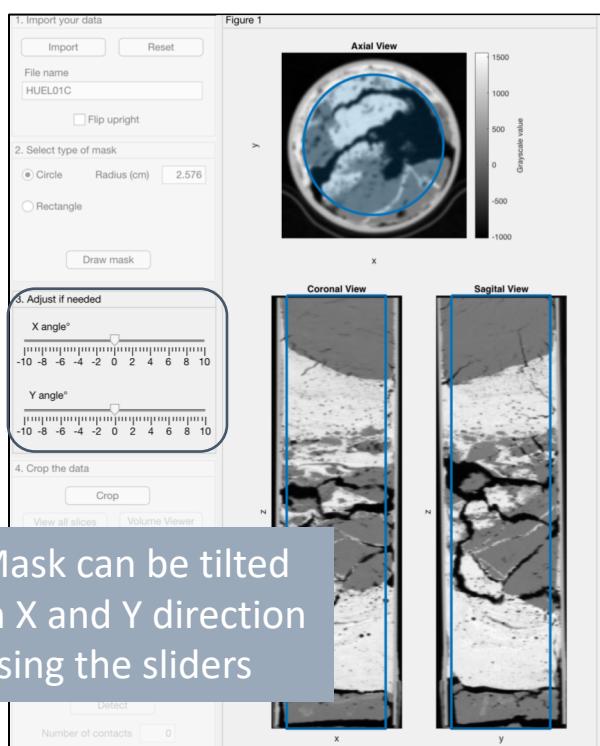


SEDIMENT CORES

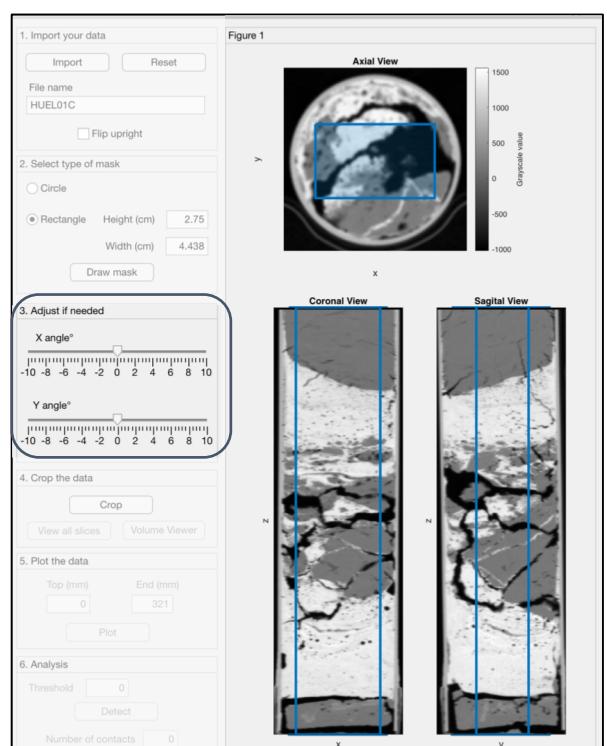


Once the files are imported, the axial, coronal and sagittal image will be printed.

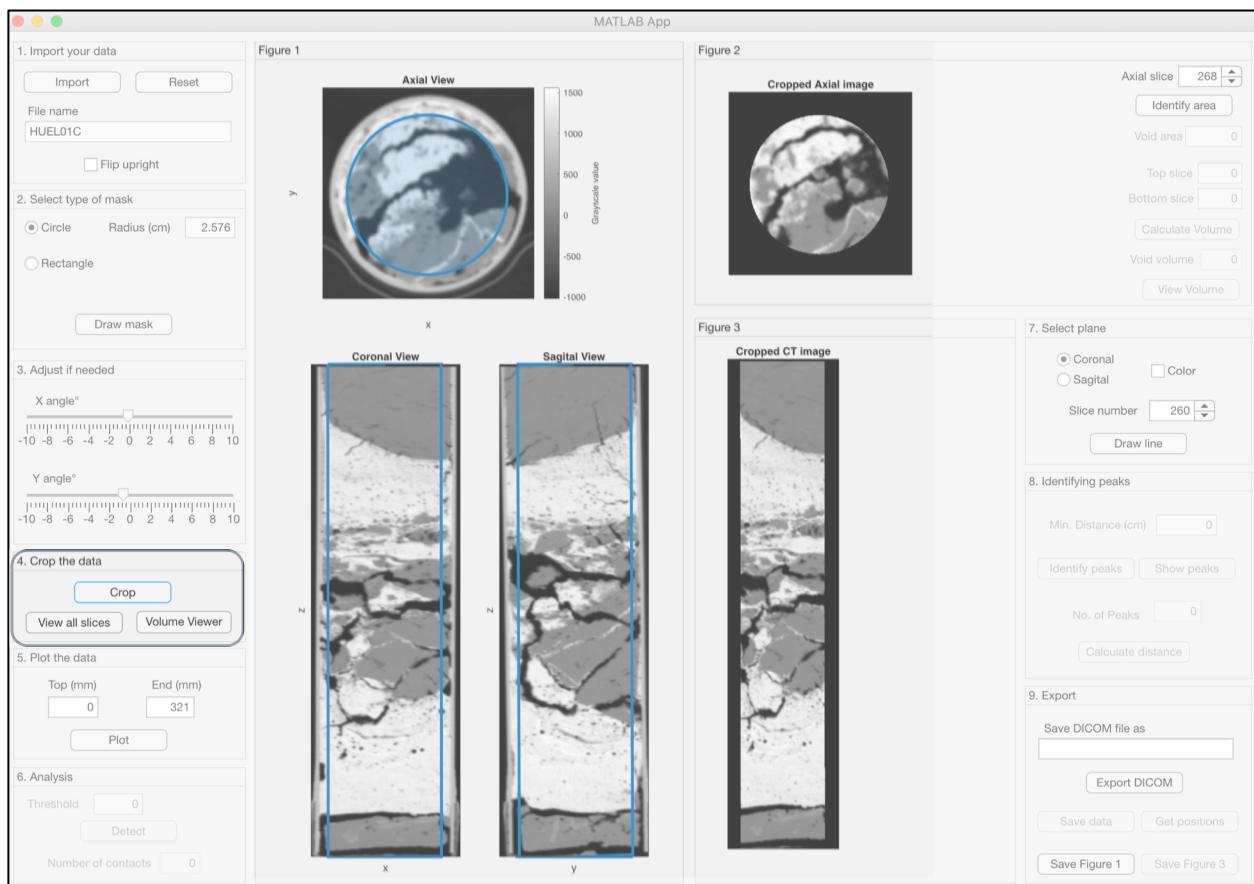
Choose either a circle or rectangle mask and click the “Draw mask” button to start drawing on the Axial image. Rectangle are printed on the sagittal and coronal images to allow user to visualize the mask down the core.



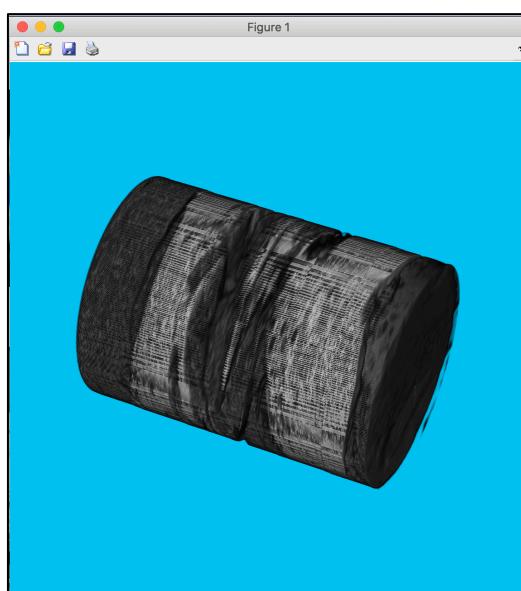
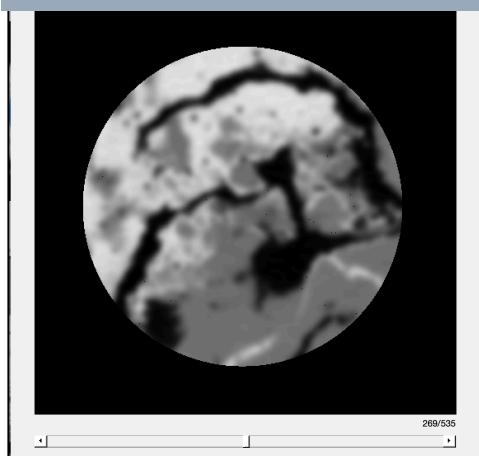
Mask can be tilted in X and Y direction using the sliders



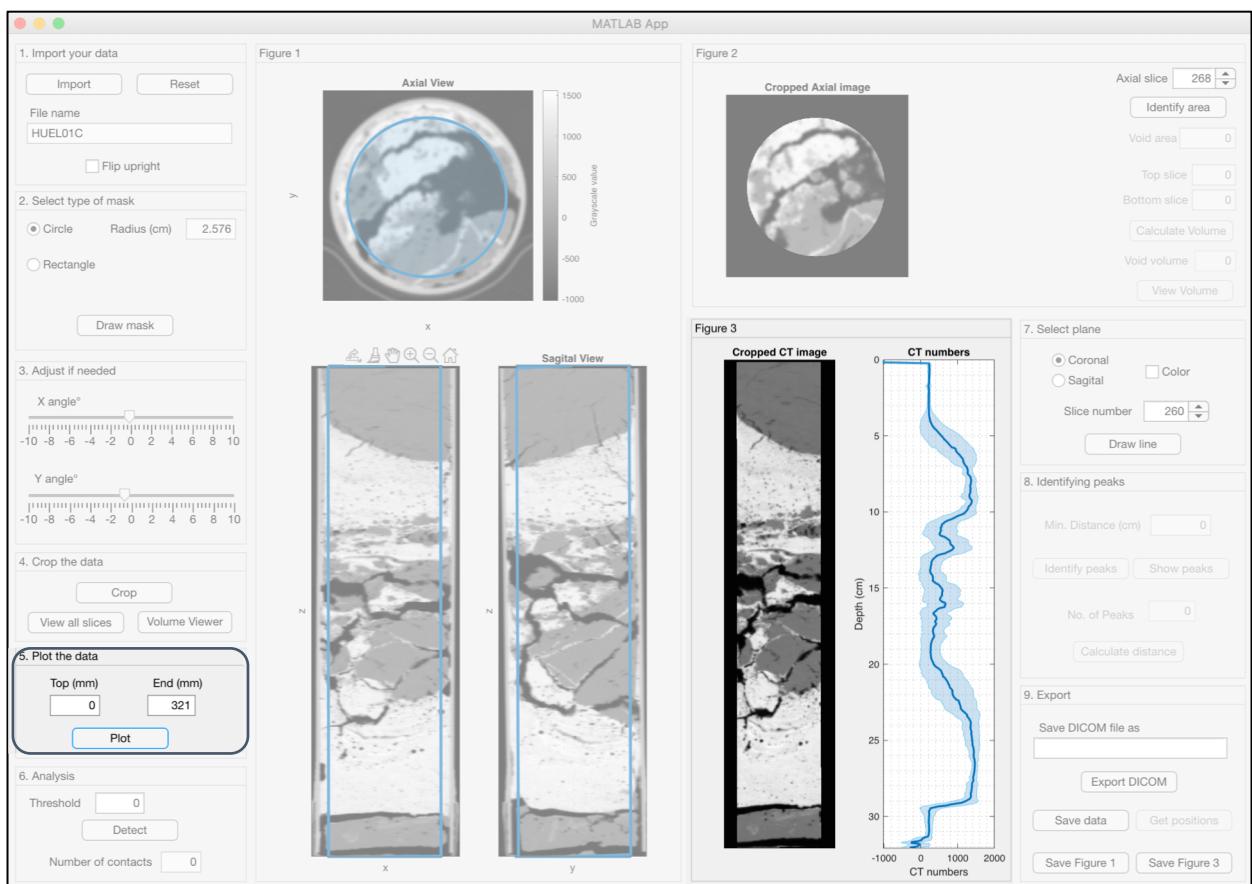
After the mask is created to satisfaction, cropping can be done by clicking the “crop” button. A cropped axial and coronal image will be printed on figure 2 and 3.



Users can see the cropped volume using the “Volume Viewer” button or see the image slice by slice by clicking the “View all slices” button.



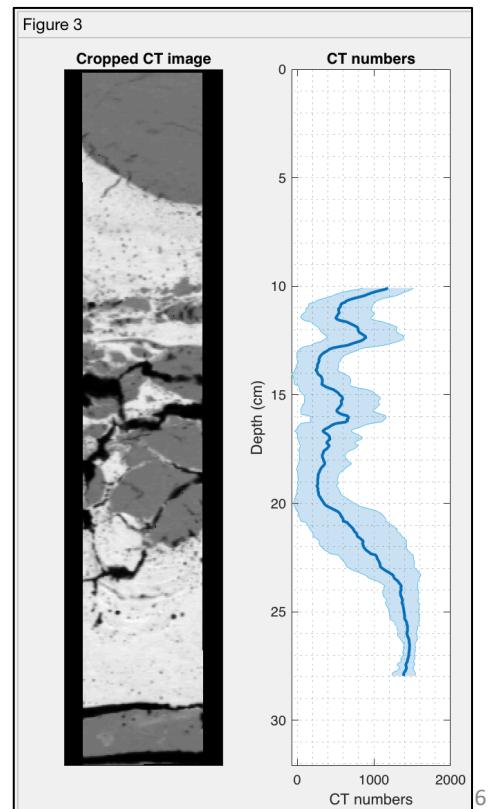
After the cropping is done, click “Plot” to plot the mean CT number profile.



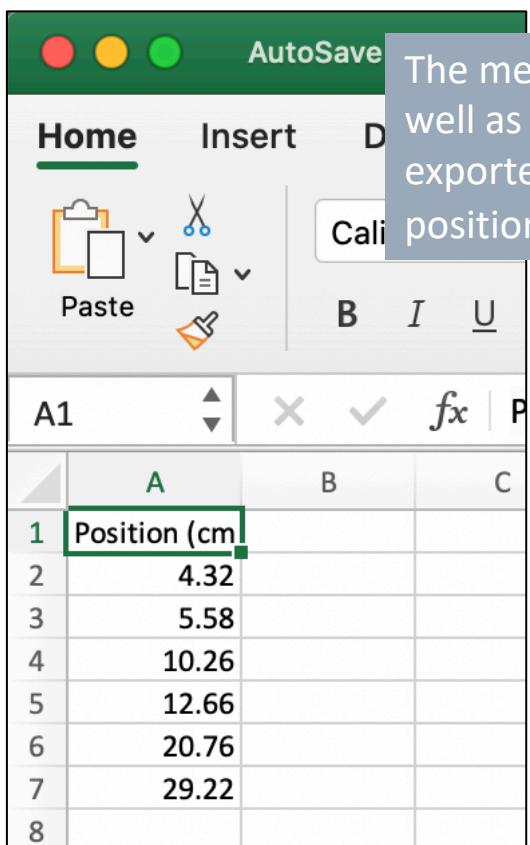
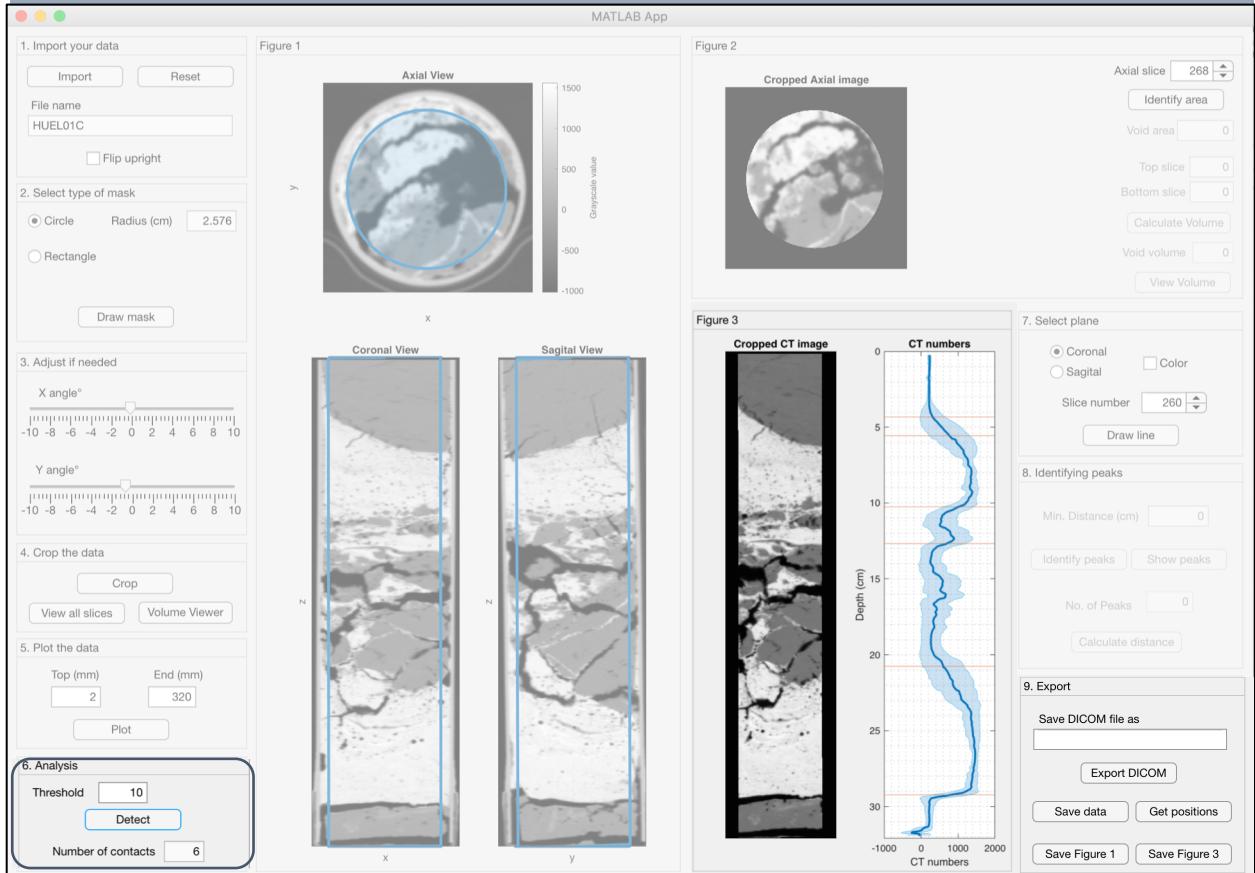
Plotting can be done for certain sections of the cropped core by editing the “top” and “end” edit fields.

5. Plot the data

Top (mm)	End (mm)
100	280
Plot	



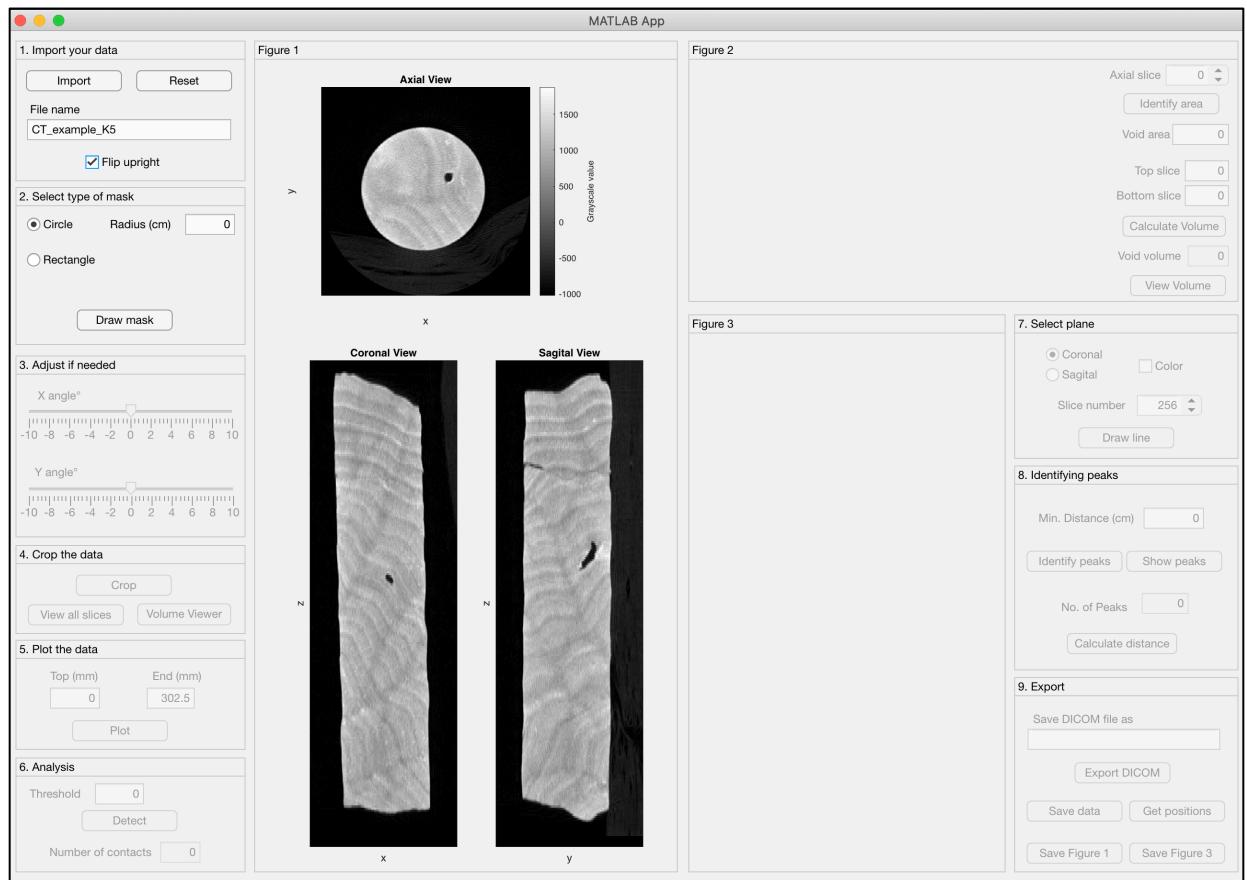
Potential contacts can be detected by clicking the “detect” button. Threshold values can be changed to control the sensitivity of the function. The number of contacts detected will be printed on the interface.



The mean CT number and standard deviation values, as well as the positions of the identified contacts can be exported into a csv file using the “Save data” and “Get positions” buttons respectively.

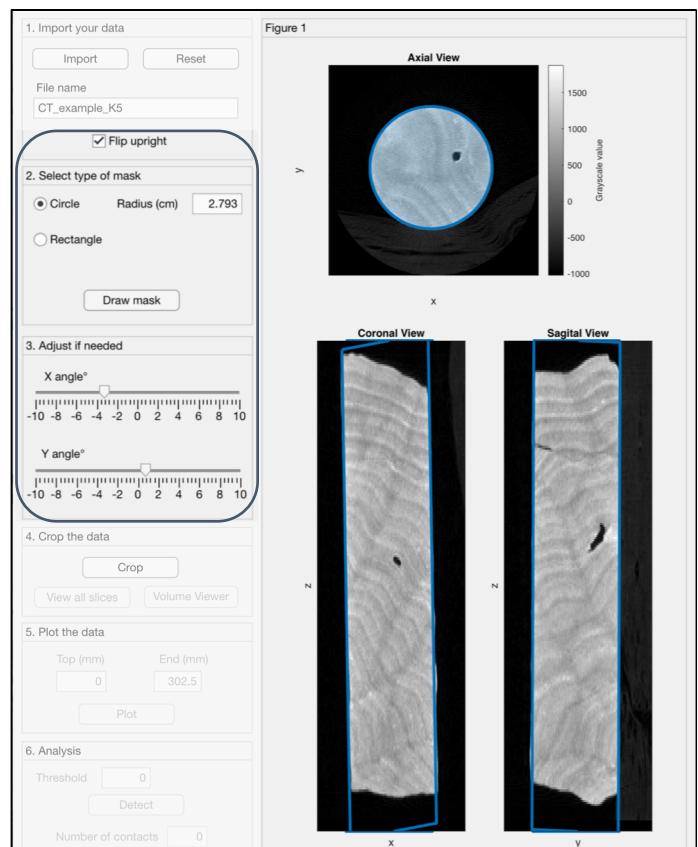
	A	B	C	D
1	Depth (cm)	Mean	Std	
2	0.24	227.281344	39.2002569	
3	0.3	227.347714	41.9437794	
4	0.36	227.609294	46.4639149	
5	0.42	227.585618	51.3270825	
6	0.48	228.609009	49.5978603	
7	0.54	231.019408	45.3877818	
8	0.6	231.993042	43.6900482	
9	0.66	231.748112	42.4277887	
10	0.72	231.270265	45.4658159	
11	0.78	229.448947	47.7332961	
12	0.84	229.139371	43.1093671	
13	0.9	229.070078	38.5664312	

CORAL CORES

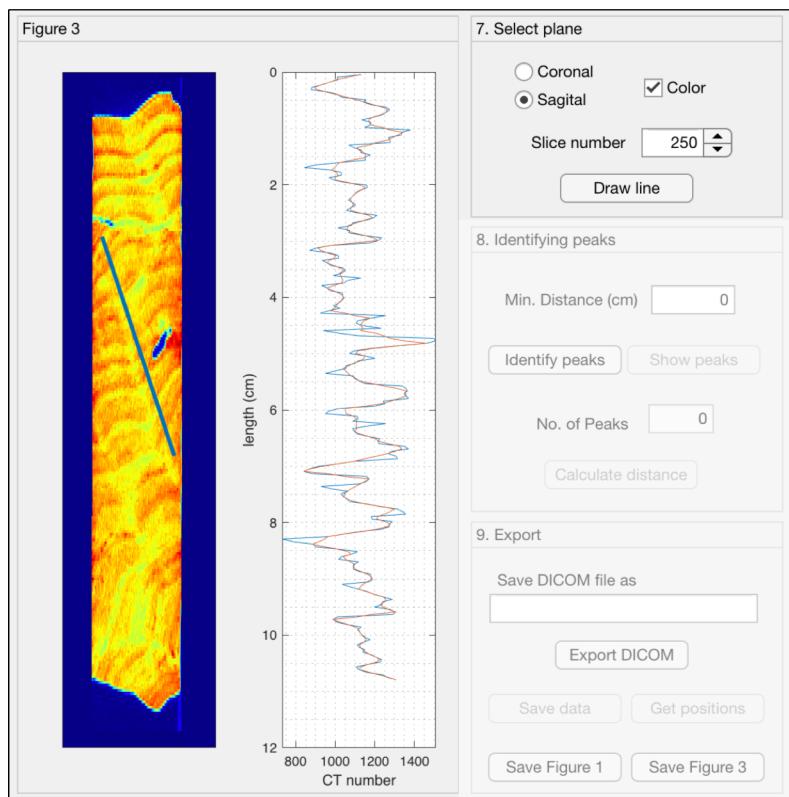
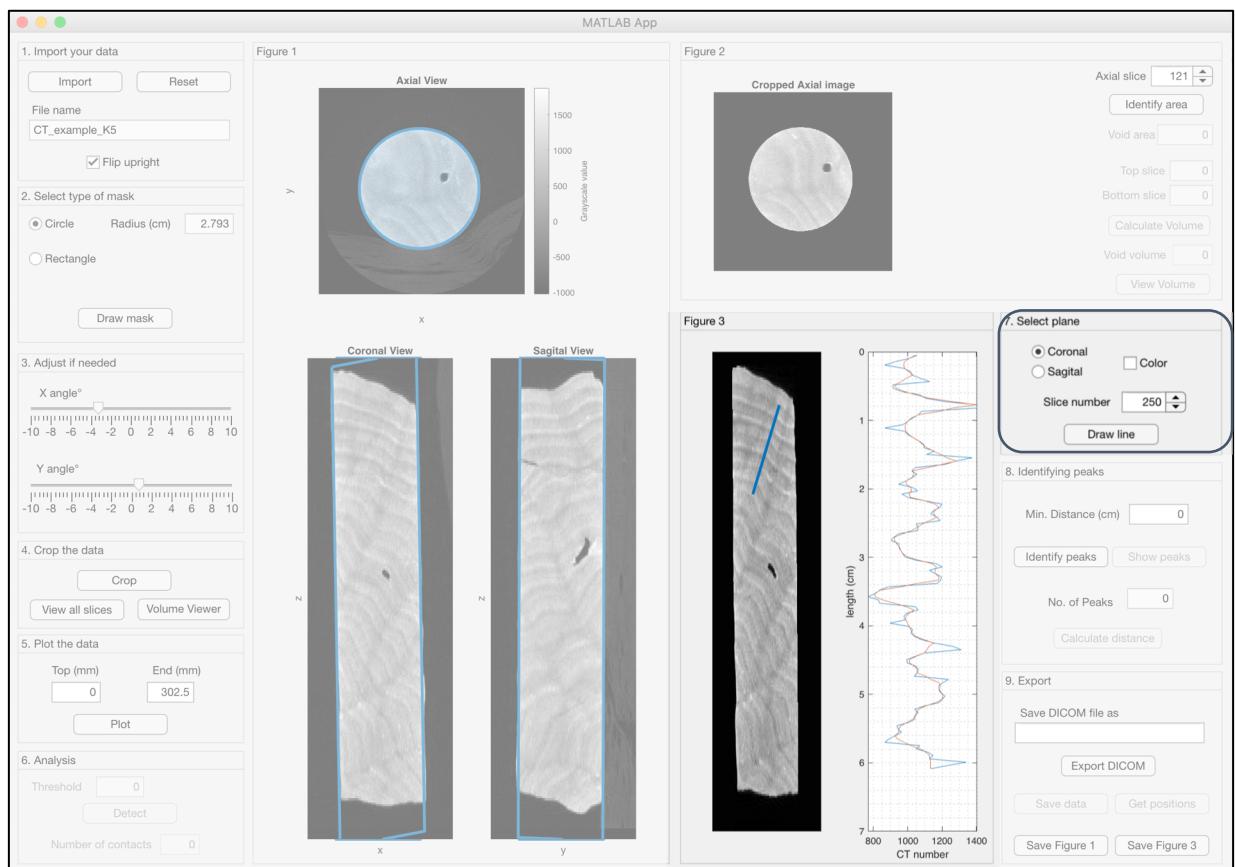


Check the 'Flip upright' box to flip the core if its not loaded in the right direction

Similarly, choose a mask to crop the volume and adjust it if need be using the sliders.

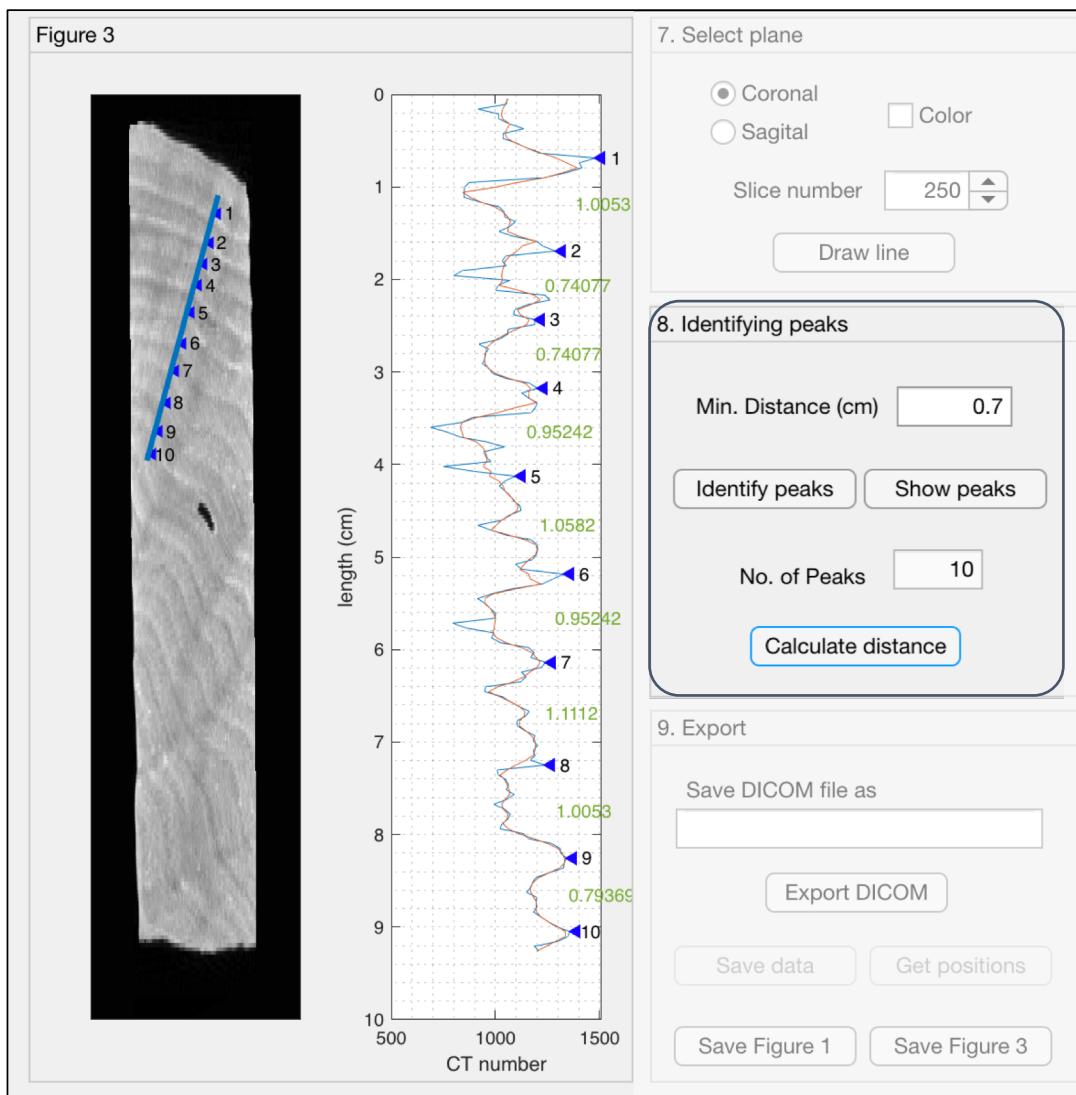


After cropping is done, user can draw on the display image in Figure 3 to obtain a CT number profile by clicking the “Draw line” button. By default, the display image is the middle coronal image.



User can choose the sagittal image and the slice number by toggling the radio button and spinner. False color can also be applied by checking the “color” checkbox.

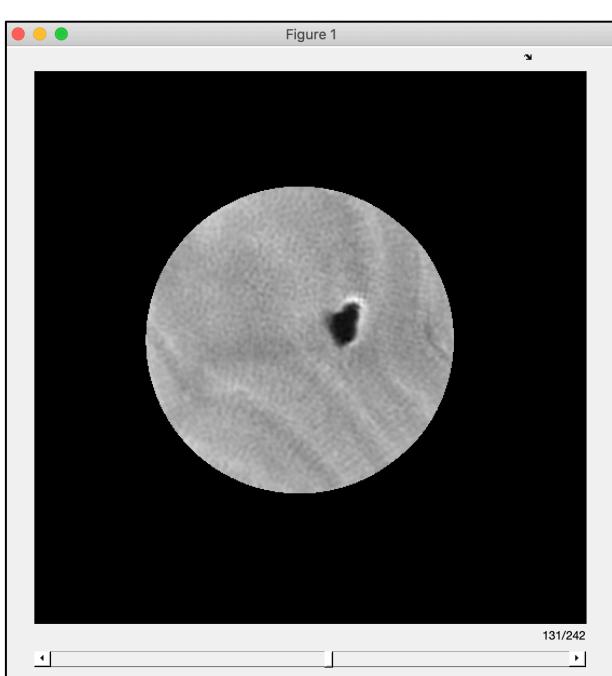
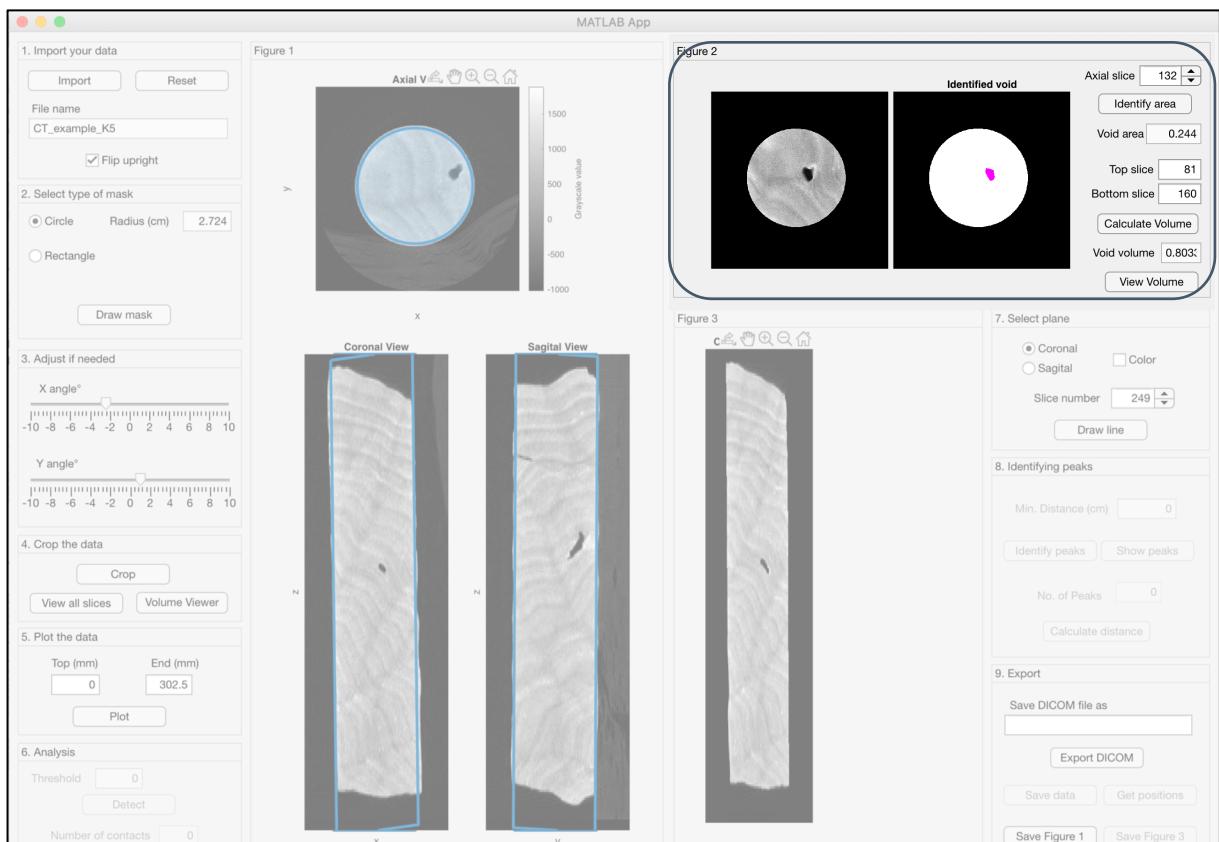
Peaks along the CT number profile can be detected by filling in the "Mini. Distance" edit field and clicking on the "Identify peaks" button. The total number of peaks identified will be printed automatically on the "No. of Peaks" edit field.



The "Show peaks" button will label the corresponding peaks on the display image.

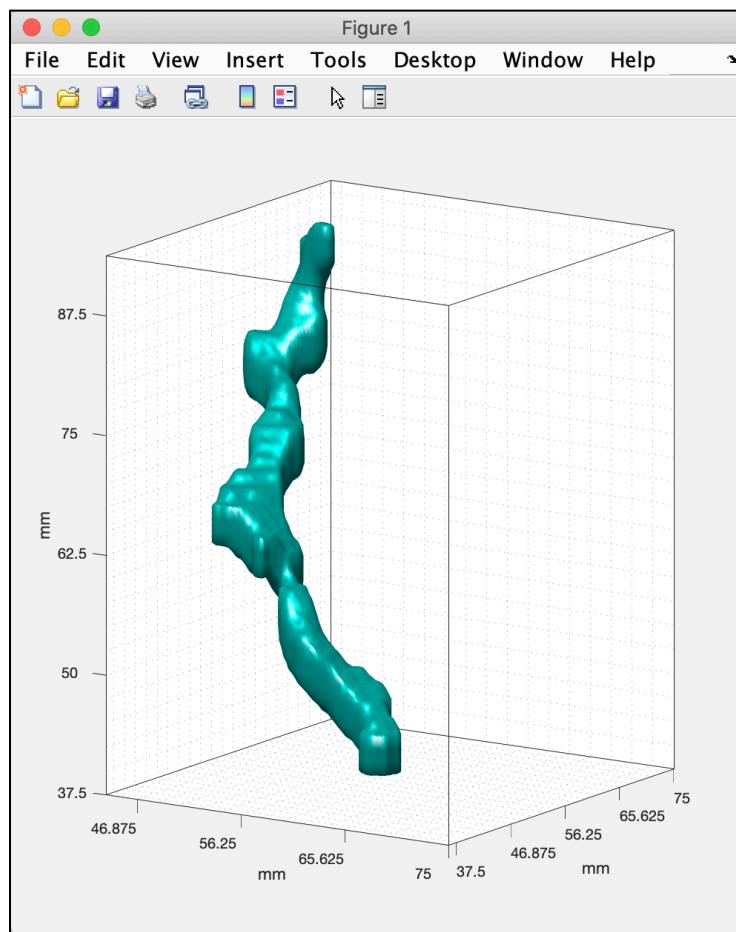
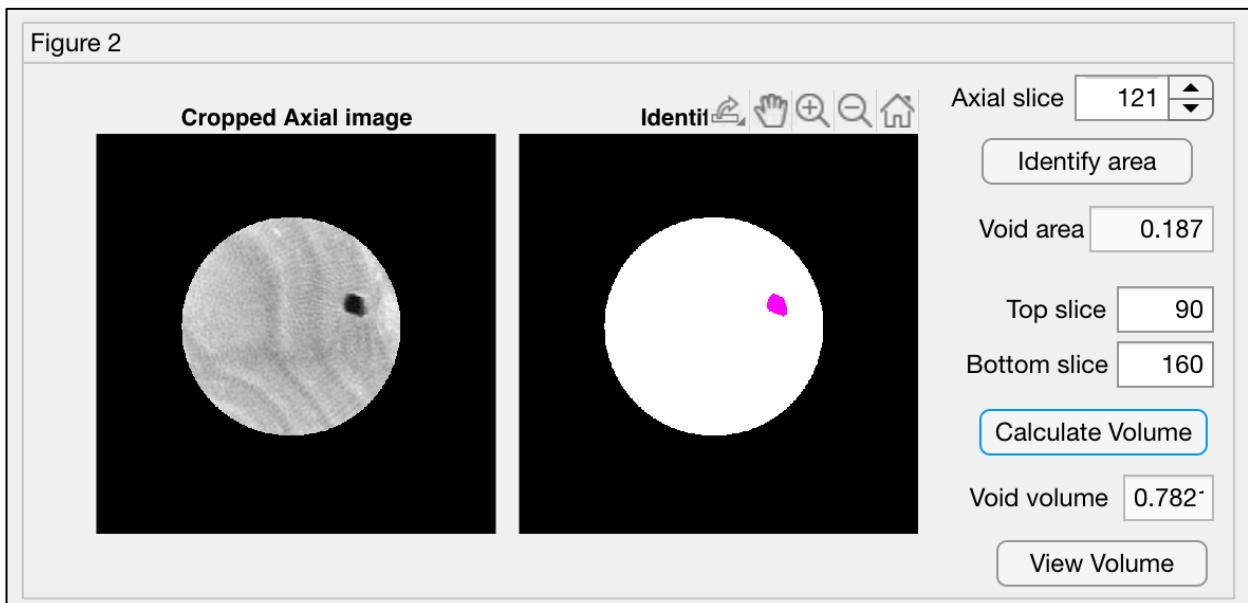
To calculate the distance between the peaks, simply click the "Calculate distance" button.

After cropping is done, user can identify and compute the area of void in an image slice by using the “Identify area” button. The default slice number is determined by the middle slice and can be changed using the spinner.



Alternatively, user can use the “View all slices” button to toggle through each image slice in a separate window.

To calculate the volume, user need to first specify the range of image slices by filling in the “Top slice” and “Bottom slice” edit fields. The volume of the identified structure can then be computed using the “Calculate Volume” button, which will be printed on the interface.



“View Volume” button will open a new window with a 3-dimensional plot of the structure.