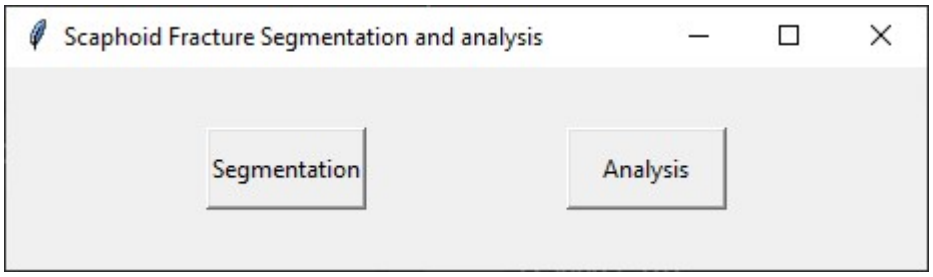
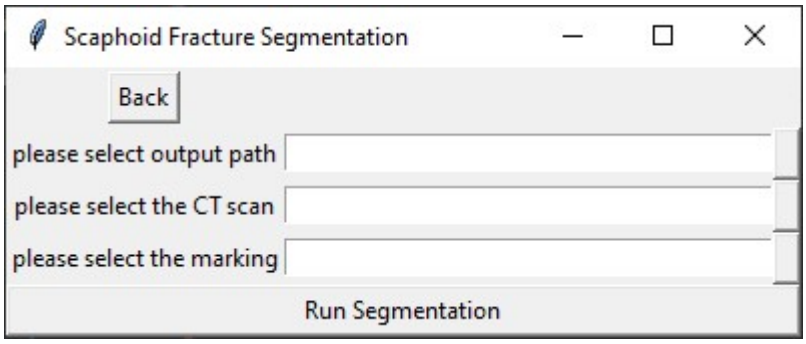
Scaphoid Project – User Manual

We compiled the program into a stand-alone executable file. Upon open, the app show the main GUI page, to allow the user selection between the segmentation process and the analysis process.



Both parts are similar in their structure and ask for three inputs: an output folder, the CT scan in a nifty format, and a nifty file containing relevant coloring of the CT.



ITK-Snap short tutorial

Our code works with files in the nifti format. Also, our code needs seeds (initial markings) in order to work properly. Conversion and seed marking can be easily done with the application ITK-SNAP.

DICOM to nifti conversion

First, load the scan to ITK-snap. From the DICOM folder, drag the folder 'DICOMOBJ' that contains all of the slices, into ITK-snap, and select the format DICOM-series.

To convert to nifti, go to *File->Save Image->Main Image*, and select nifti format.

Initial seed markings

Load the image to ITK-snap (either the nifti format or the original DICOM). Press the 'Paintbrush mode', Mark the bone in red (in one slice), and the fracture in green. Save the file in a nifti format.

Segmentation Process

This process creates the segmentation for the Fracture and the Scaphoid bone. Note that you can edit the segmentation using ITK-Snap.

The first entry is the output path. All of the new files that are created due to the code will be saved there. Note that if the file already exists, it will be overwritten.

The second entry is the actual CT scan in nifti format. Make sure it is the original scan, without any markings on it.

The third entry is a nifti file that contains the seeds for the Scaphoid bone and the fracture. Create the Scaphoid bone seeds with the first color (red), and the fracture seeds with the second color (green).

Analysis Process

This process creates all of the geometrical features of the fracture, and the division of the fracture and bone into 4 quarters according to the radius bone.

The first entry is the output path. All of the new files that are created due to the code will be saved there. Note that if the file already exists, it will be overwritten.

The second entry is the actual CT scan in nifti format. Make sure it is the original scan, without any markings on it.

The third entry is a nifti file that contains a full segmentation of the fracture and Scaphoid bone, as well as seeds for the Radius bone, and 2 markings that belong to the main axis of the Capitate bone. Create the Radius bone seeds with the third color (blue), the top seeds of the Capitate with the fourth color (yellow) and the bottom seeds as the fifth color (light blue).