Instruction for use

# Purpose

This algorithm is used to generate a 3d plot from a series of 2d frames of ultrasound images. The user has to manually draw the contours of 2d frames, and the 3d plot of all the frames will be generated.

# Usage

1. There are 3 methods in which the 3d model can be generated: linear, rotate and sweep. The files “mainLinear”, “mainRotate” and “mainSweep” correspond to each of these methods. Open the file in Matlab for the desired method.
2. If collecting data directly from ultrasound, open the ultrasound SDK that comes with the portable ultrasound. If not, skip to step 3.
3. Run the section labelled “Define variables”.
4. If processing images that has been already collected, go to the section “Import images into struct”, change the file directory, and run the section. If collecting data directly from ultrasound, run the section “Capture US”.
5. To remove undesired image, run the section “Choose US images”.
6. Run the section “Define user input”. This section allows the user to draw the contour of the organ.
7. Run the section “Calculate volume”. This section calculates the volume of the organ from the user-defined contours using 5 different algorithms: MVEE, ellipsoid, sum of area, trisurf and bullet formula. For details on each algorithm, please refer to journal paper.
8. Run the section “Plot results” to view the 3d plot of the organ generated by each of the algorithms.
9. To plot the results in 6 frames, run the section “Plot experimental results”.

# Other available algorithms

* The file “mainNew” can generate frames automatically from 3 frames defined by user.
* The file “mainMRI” is used for MRI images. It works in a similar way to “mainLinear”.