

Volumetric Image Visualization

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Task 6

1 Surface rendering with transparency

Figure 1 illustrates the rendition of transparent objects with a distinct color per object.

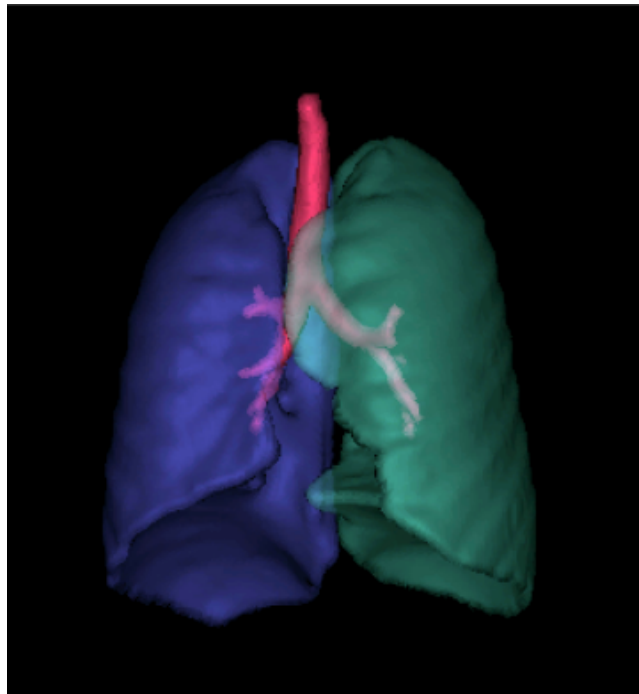


Figura 1: Example of surface rendering with transparent color objects.

2 Task

You must improve your previous C code from task 5, `surface-rendering.c`, with the following usage:

surface-rendering P1 P2 P3 P4 P5 P6 P7 P8 P9, where

P1 is the name of the original scene (.scn).

P2 is the name of the label scene (.scn).

P3 is the viewing tilt angle α .

P4 is the viewing spin angle β .

P5 is the resulting rendition (.png).

P6 is the opacities of the objects in P2 (e.g., “ o_1, o_2, o_3 ” for three objects in P2)

P7 is 0 for scene-based normal vector and 1 for object-based normal vector.

P8 is the visibility of each object (e.g., “0,1,1” for three objects means that only objects o_2 and o_3 are visible).

P9 is an optional $p_0 = (x_0, y_0, z_0)$ coordinates of a point p_0 in the scene.

The code should create a rendition in P5 for the objects in P2 by assigning a random color, opacity value (P6), and visibility (P8) option to each object, using the provided viewing direction in P3 and P4, and computing surface normal vectors according to P7. Parameter P9 is by default the center of the scene P1. However, you may enter with “ x_0, y_0, z_0 ”. You should create three extra images, axial.png, coronal.png, and sagittal.png with the corresponding slices at p_0 overlaid by the transparent color masks of the objects, whenever they are visible.