

Report for project 2

1 Introduction

In this project, a program was implemented which use OpenGL to visualize the data of brain surface. Firstly, the data has been read from the text file with specified format. The data has been stored as indexes of triangle vertex and the vertex 3D coordinates. The triangles which contributes to the brain surface have been visualized with uniformed color. After that, the normal vector of each triangle have been calculated, and the ambient\directional light source has been added. The surface property of model has been adjusted to make the image realistic.

2 To compile and run the code

linux environment with OpenGL package installed is required. To compile the code, type make in terminal. To run the code, type `./brain.x<data.txt`, the window which display the model will pop out. To adjust the position\ scale of the model, use following keyboard controls:

- x/X: Positive/negative X-axis shift of the model
- y/Y: Positive/negative Y-axis shift of the model
- s/S: decrease/increase the scale of model
- UP/DOWN ARROWS: (zoom) Z-axis shift of the model
- LEFT/RIGHT ARROWS: Y-axis rotations
- PAGE UP/DOWN: X-axis rotations
- ESC: exit

3 Results

After implementation of the visualization of model with uniform color, the result was shown in Figure 1. We can only see the boundary of the brain model in this condition. The surface structure cannot be reflected without adding the light source.



Figure1: The brain model with uniform color.

After the light source was added, the model was shown in Figure 2. In this case, we can clearly see the surface structures of the model owing to the reflection and shadow. The image was more realistic compared to the situation in Figure 1.

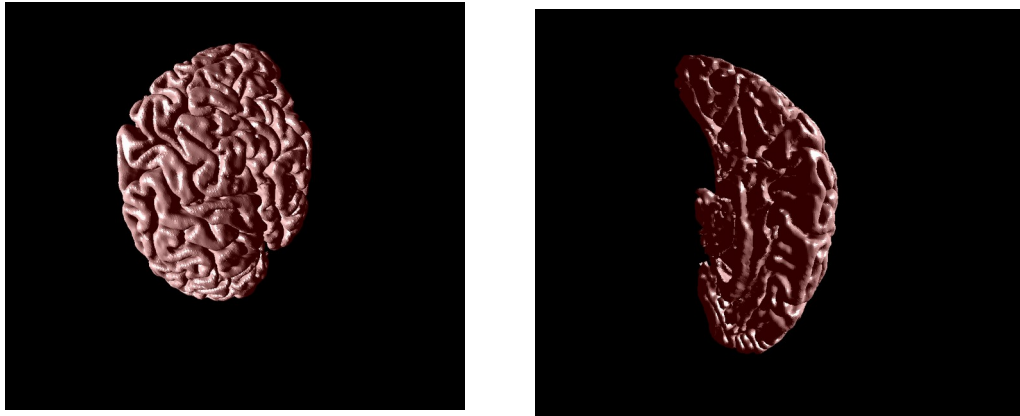


Figure 2: The brain model with both directional and ambient light source. The directional light source is white in color, and the ambient light source is red in color.