COSC3000 S1 2024

Graphics project

Due 28th March, 2024

Task

Display some 3D objects. Use these to demonstrate the use of geometric transformations, including translation, rotations, and scaling.

Use the scalar product (dot product) to determine whether patches are facing toward or away from a particular point, and colour them to indicate the direction they face. (You can also use colour to indicate the angle.)

Some 3D objects (in OBJ file format) are provided, and you can use other objects as well (either generated by yourself or downloaded).

Your project report should show the objects, and the effect of the transformations, and your direction-determined colouring. Describe your methods, and give explanations that show your understanding.

You can use software of your choice to display these. You can do this, for example, using the 3D plotting methods available in Matlab and Python. You should perform the transformations explicitly, using transformation matrices, rather than using high-level routines/software.

You can download suitable software for reading OBJ files, rather than writing your own.

You do not need to display textures. It is sufficient to display wire-frame models with plain colours.