LAB 4 REPORT: IMPLICIT SOLIDS

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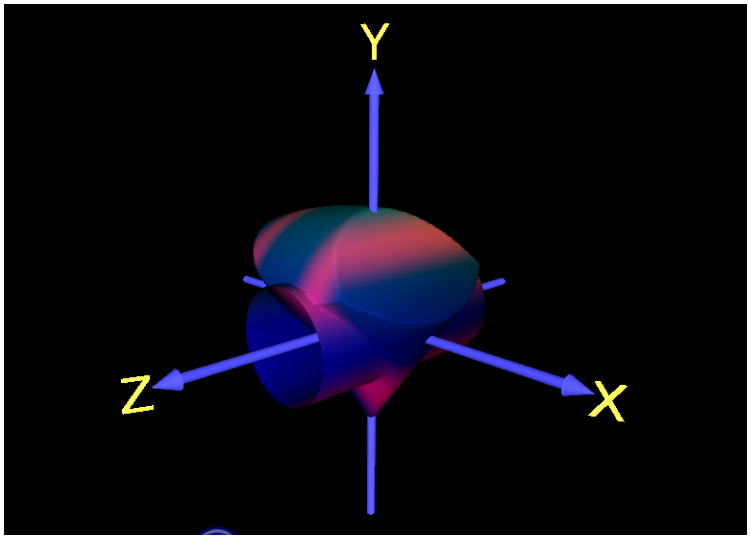
CZ2003 Computer Graphics and Visualization | Nanyang Technological University

CSG Solid

morphing_animation.wrl




```
ellipsoid=1-(x)^2-(y/0.5)^2-(z/0.5)^2;
cone=((x)^2+z^2)/(0.5/0.75)^2-(y+0.5)^2;

cylinder=0.25^2-x^2-y^2;
plane=1-(x/0.5)-(y/0.5);

final=min(ellipsoid, -cone);
final=max(final, cylinder);
final=min(final, plane);

return final;
```

min(max(min(ellipsoid, -cone), cylinder), plane) >=0

First, the ellipsoid is substracted with the cone (moved 0.5 units in the negative direction of y-axis). Then, the volume of the cylinder is added (union) to the figure. At the end, a plane is used to cut the figure.

The sampling resolution value is adjusted to 100 in all parameters. With this value we get decent graphics and render time for this case. The bounding box remains in the origin with a size of 2 in the x-axis and 1 in the y-axis and z-axis.

Regarding the color function:
diffuseColor "r=sin(4*pi*u); g=v; b=(w+1)/2;"

The values for each parameter will be contained in the interval [0, 1]. Sine function always return a value inside [0,1], and ‘v’ and ‘w’ can only take values in [-0.5, 0.5]