

NANYANG
TECHNOLOGICAL
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CZ2003 Computer Graphic

Lab 5

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Matriculation Number: U1521567A

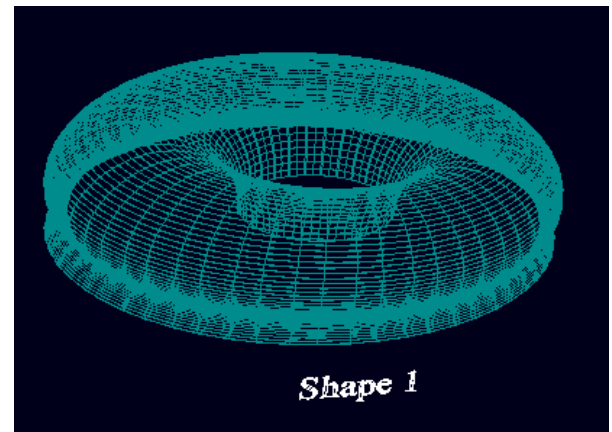
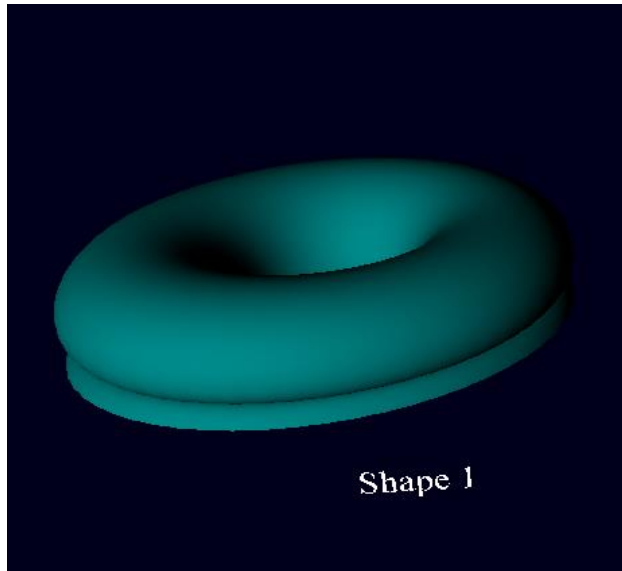
File	Description
Morphing.wrl	Shape1 and Shape2 with morphing

Group Name: SSP1

No. 9

Formula 1 = 9

Formula 2 = 10



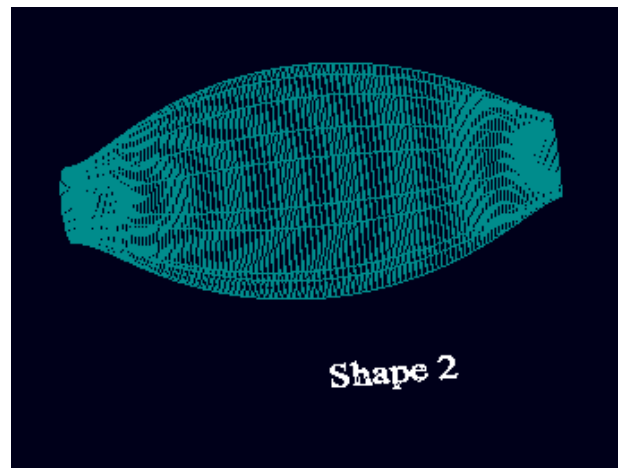
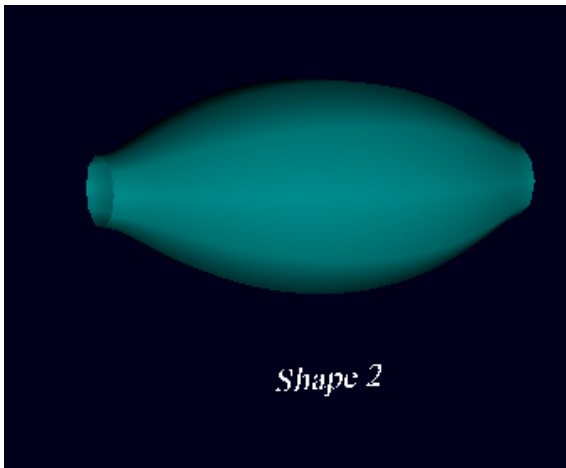
```
## the following codes for shape 1
Transform(
  translation -5 0 0
  children[
    FShape {
      geometry FGeometry {
        resolution [75 75]
        parameters [0 1 0 1]
        definition "
          function parametric_x(u,v,w,t)
          { x1=0.5*cos(16*u)*(-3 + (cos(4*v)*(1+cos(4*v)))));
            return x1;
          }

          function parametric_y(u,v,w,t)
          { y1=0.5*(sin(4*v)*(1+cos(4*v)));
            return y1;
          }

          function parametric_z(u,v,w,t)
          { z1=0.5*sin(16*u)*(-3 + (cos(4*v)*(1+cos(4*v)))));
            return z1;
          }"
        }

      appearance FAppearance {
        material FMaterial {
          diffuseColor "r=0; b=0.55; g=0.55;"
        }
      }
    ]
  ]
}
```

Using the formula from the lab document, I was only able to produce a part of the whole shape. This is because parameters were limited to [0 1 0 1]. To form a full shape using [0 1 0 1], the values of u and v must be multiplied by 4.



```
## the following codes for shape 2
Transform(
  translation 5 0 0
  children[
    FShape {
      geometry FGeometry {
        resolution [120 120]
        parameters [0 1 0 1]
        definition "
          function parametric_x(u,v,w,t)
          { x2=0.5*((6*v-0.5*sin(6*v))-3);
            return x2;
          }

          function parametric_y(u,v,w,t)
          { y2=0.5*cos(24*u*pi) * (1 - 0.5*cos(6*v));
            return y2;
          }

          function parametric_z(u,v,w,t)
          { z2=0.5 * sin(24*u*pi) * (1 - 0.5*cos(6*v));
            return z2;
          }"
        }

      appearance FAppearance {
        material FMaterial {
          diffuseColor "r=0; b=0.55; g=0.55;"
        }
      }
    }
  ]
}
```

Similar to shape 1, we need to alter the formula so that the full shape will be shown.

Resolution was also changed to ensure that the model is smooth.

To transform Shape 1 to Shape 2, both formula have to be added into the morphing definition.

```

geometry FGeometry {
resolution [50 50]
parameters [0 1 0 1]
# Definition of the animated linear transformation (morphing)
# of one surface defined by      x1(u,v), y1(u,v), z1(u,v)
# to another surface defined by x2(u,v), y2(u,v), z2(u,v)
definition "
function parametric_x(u,v,w,t)
{ x1=0.5*cos(16*u)*(-3 + (cos(4*v)*(1+cos(4*v))));
  x2=0.5*((6*v-0.5*sin(6*v))-3);
  return x1+(x2-x1)*t;      }

function parametric_y(u,v,w,t)
{ y1=0.5*(sin(4*v)*(1+cos(4*v)));
  y2=0.5*cos(24*u*pi)*(1 - 0.5*cos(6*v));
  return y1+(y2-y1)*t;      }

function parametric_z(u,v,w,t)
{ z1=0.5*sin(16*u)*(-3 + (cos(4*v)*(1+cos(4*v))));
  z2=0.5 * sin(24*u*pi) * (1 - 0.5*cos(6*v));
  return z1+(z2-z1)*t;      }"
}

appearance FAppearance {
material FMaterial {
diffuseColor "r=0; b=0.55; g=0.55;"
}
}

```

