Nanyang Technological University

Lab 5 Report: Parametric Metamorphoses

CZ2003 Computer Graphics and Visualization

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| **Object 1** | **Object 2** | **Note** |
| Above is the snapshot of “Shape1\_number 4.wrl” which define an object with parametric equation x= cos(pi\*v)\*sin(pi\*v), y= cos(2\*pi\*u)\*sin(pi\*v), and z= sin(2\*pi\*u)\*sin(pi\*v) with parameter domain [0,1 0,1]. The sampling resolution is 75 | Above is the snapshot of “Shape1\_number 4.wrl” but this is viewed in wireframe mode. | The origin parametric equation is    In order to use parameters u and v in the same ranges of u=[0,1] and v=[0,1], I modified the equation in this way. |
| Above is the snapshot of “Shape2\_number 5.wrl” which define an object with parametric equation x= cos(pi\*v), y= cos(2\*pi\*u)\*sin(pi\*v), and z= sin(2\*pi\*u)\*cos(pi\*v) with parameter domain [0,1 0,1]. The sampling resolution is 75 | Above is the snapshot of “Shape2\_number 5.wrl” but this is viewed in wireframe mode. | The origin parametric equation is  In order to use parameters u and v in the same ranges of u=[0,1] and v=[0,1], I modified the equation in this way. |

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| **Object 1** | **Note** |
| Above is the snapshot of “morphing.wrl” which define an object morphing from shape1 to shape2 with parametric equations below:  function parametric\_x(u,v,w,t)  { x1=cos(pi\*v)\*sin(pi\*v);  x2=cos(pi\*v);  return x1+(x2-x1)\*t;}  function parametric\_y(u,v,w,t)  { y1=cos(2\*pi\*u)\*sin(pi\*v);  y2=cos(2\*pi\*u)\*sin(pi\*v);  return y1+(y2-y1)\*t;}  function parametric\_z(u,v,w,t)  { z1=sin(2\*pi\*u)\*sin(pi\*v);  z2=sin(2\*pi\*u)\*cos(pi\*v);  return z1+(z2-z1)\*t;}"  The resolution is [100 100]  cycleInterval is 2 | To make the graph smoothly morphing between shapes, I adjusted the resolution parameters to 100.  To get a smooth morphing, I have tried to switch the u and v parameter in the equation, and in this order, the morphing is smoother. |