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Subject: 3D Objects

Posted by [JayDog](#) on Wed, 18 Feb 2009 17:10:22 GMT

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Hi,

I'm trying to represent my 3D data and I guess using some form of object graphics would be appropriate. I got Ronn Kling's book on this, but the examples are really of 2D data represented in 3D (such that the image intensity values might represent heights say). In my case I have a form of ellipsoid mesh with arrays of points in the x, y, z directions and would like to construct a surface upon this mesh of points. Would anyone know of a way to do this, or other resource I might check out?

Thanks,  
Jason.

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Subject: Re: 3D Objects

Posted by [David Fanning](#) on Mon, 30 Mar 2009 15:10:29 GMT

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JayDog writes:

- > What I actually have is a set of 2D points (x,y) which define an
- > ellipse, then stacking many ellipses of varying size in the z-
- > direction gives me what appears to be a 3D structure outlining a type
- > of ellipsoid. What I would like to do is fill-in the structure so that
- > I can make it a surface which I can then perform different operations
- > on, such as taking measurements of widths etc. or doing some form of
- > illumination with objects light source or other.

This article discusses a possible approach to this problem:

[http://www.dfanning.com/graphics\\_tips/mesh.html](http://www.dfanning.com/graphics_tips/mesh.html)

Cheers,

David

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David Fanning, Ph.D.

Coyote's Guide to IDL Programming ([www.dfanning.com](http://www.dfanning.com))

Sepore ma de ni thui. ("Perhaps thou speakest truth.")

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Subject: Re: 3D Objects

Posted by [rtowler](#) on Mon, 30 Mar 2009 19:03:03 GMT

On Mar 30, 7:52 am, JayDog wrote:

> Cheers Rick,  
> What I actually have is a set of 2D points (x,y) which define an  
> ellipse, then stacking many ellipses of varying size in the z-  
> direction gives me what appears to be a 3D structure outlining a type  
> of ellipsoid. What I would like to do is fill-in the structure so that  
> I can make it a surface which I can then perform different operations  
> on, such as taking measurements of widths etc. or doing some form of  
> illumination with objects light source or other.

Flashback... I used to do this with fish. You have a couple of options. The easiest is to use MESH\_OBJ to construct your stacked ellipsoid object by extruding your x,y ellipsoids in z and then assembling your individual IDLgrPolygons. If your ellipsoid vertices are regular(ish) and share the same number of verts between them you can mesh the entire set. (you can of course mesh the object if the number of vertices differ between ellipsoids but this is more difficult.)

Attached is an excerpt from my meshing code. It generates the vertex and polygon connectivity array that you can then pass to IDLgrPolygon. It is simple, but it works. If you're going to use the MESH\_VOLUME or MESH\_SURFACEAREA functions you will want to verify that the polygons are wound correctly (I believe they are, but have not verified this).

-Rick

xyz = struct containing arrays of X,Y, and Z vertex data in the form  
[nEllipsoids, mVertsPerEllipsoid]  
numcyl = the number of ellipsoids in your vertex array (same as  
nEllipsoids)  
nRollPts = the number of x,y vertices in your ellipsoid (same as  
mVertsPerEllipsoid).

```
; Create the vertices and mesh connectivity arrays
vertices = FLTARR(3,nRollPts * numcyl, /nozero)
polygons = LONARR(5 * nRollPts * (numcyl-1), /nozero)

for icyl=0, numcyl-1 do begin
    vertices[0,icyl * nRollPts:(icyl+1) * nRollPts-1]= xyz.z
[icyl,*] / 2.
    vertices[1,icyl * nRollPts:(icyl+1) * nRollPts-1]= xyz.y
[icyl,*]
    vertices[2,icyl * nRollPts:(icyl+1) * nRollPts-1]= xyz.x
```

```
[icyl,*]
  if (icyl lt (numcyl-1)) then begin
    roll_ids = LINDGEN(nRollPts)
    conn_off = nRollPts * icyl * 5
    count_ids = (roll_ids * 5) + conn_off
    cyl0_off = nRollPts * icyl
    cyl1_off = nRollPts * (icyl+1)
    polygons[count_ids] = 4
    polygons[count_ids+1] = roll_ids + cyl0_off
    polygons[count_ids+2] = (roll_ids+1) MOD nRollPts +
cyl0_off
    polygons[count_ids+3] = (roll_ids+1) MOD nRollPts +
cyl1_off
    polygons[count_ids+4] = roll_ids + cyl1_off
  endif
endfor
```

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Subject: Re: 3D Objects

Posted by [JayDog](#) on Wed, 15 Apr 2009 10:36:11 GMT

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Thanks for your help guys. I might be able to work something out - turns out it's trickier than I first explained since each ellipse slice (the 2D ellipses in x,y) can be tilted with regard to the rest so stacking in the z-dir isn't as straightforward.

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