Subject: 3d graphics
Posted by mallozzi on Mon, 26 Sep 1994 16:12:24 GMT
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I am trying to make a sphere by drawing a number of great circles.
I have made a great circle in the xy plane as follows:

Make 3d box using SURFACE
x = 1.0 * COS(theta)
y = 1.0 * SIN(theta)
z = 0.0
plots, x, y, z, /t3d

Next I tried to rotate the circle by 90 degrees about x-axis, for example:
t3d, rotate=[90, 0, 0]
plots, x, y, z, /t3d
but this doesn't work. How do I redraw circle at different orientations?

Thanks, Bob Mallozzi
mallozzi@ssl.msfc.nasa.gov

Subject: Re: 3D graphics
Posted by Liam Gumley on Wed, 16 Oct 1996 07:00:00 GMT
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Nigel Helliwell wrote:
> Can anyone give me any pointers to publically available 3D graphics
> code and/or related material. I've recently started on a new project
> involving Three dimensional modeling and the manuals for Idl are lacking
> in detail in this area, so I need to know what is possible

If you are going to display/animate three dimensional volumes of
time-series
data (e.g. numerical weather model output), then check out Vis5D. It's
free,
and available at

http://www.ssec.wisc.edu/~billh/vis5d.html

Cheers,
Liam.

Subject: Re: 3d graphics
Posted by David Fanning on Mon, 24 Feb 2003 02:54:32 GMT
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Dan Madeira (d.madeira@ucl.ac.uk) writes:

> I'm doing a undergrad group project where we have to use IDL to code a
> sterographic representation of the solar system. However we have no prior
> knowledge of this language, and so we are a little bit stuck....
>
> We have drawn four globes representing the Earth, moon, mars and the sun
> using the `orb` procedure, and then used a for loop to translate the globes
> according to a specified orbit, redrawing the view in both the right view
> and left view widgets each time. However this results in a large lag between
> each update, which ruins the steroscopic effect. Has anyone got any ideas of
> a faster technique?

This isn't that class with Professor Machiavelli, is it?
This seems just a tad too ambitious for someone with
no IDL experience. :-(

In any case, I think you are going to want to capture
your drawings as images and animate them in something like
XInterAnimate. I presume you are using object graphics,
so you can use the READ method on the window (or draw widget)
to take a snapshot of the window. Then get the actual image
data out of the image object you create. You can use the
image data as input to XInterAnimate.

> Also, we would like to have a globe, which is internally lit, representing
> the sun. However when we placed a light source inside the orb, its surface
> remained unlit though the other objects were properly lit. Is there any
> simple way of solving this?

I don't think so. Or, I should say, I didn't come up with
anything in a couple of hours of fooling around with it.
It seems like there should be a way, but the surface of
the orb object (a polygon object) seems opaque to the light
source inside. I even tried adding a texture map to the orb
and allowing alpha transparency. I can manage to see other
things inside the orb, but not the light. :-(

I thought about putting a directional spotlight just
outside the surface of the "sun" object and rotating it
so that it always points to the viewer's eye, but I'm trying
to get a life and this seemed like WAY too much work!

Cheers,

David
--
David W. Fanning, Ph.D.

Fanning Software Consulting, Inc.
Phone: 970-221-0438, E-mail: david@dfanning.com
Coyote's Guide to IDL Programming: http://www.dfanning.com/
Toll-Free IDL Book Orders: 1-888-461-0155

Subject: Re: 3d graphics
Posted by Karl Schultz on Mon, 24 Feb 2003 18:12:10 GMT
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"Dan Madeira" <d.madeira@ucl.ac.uk> wrote in message
news:b3blob$j42$1@uns-a.ucl.ac.uk...
> Hi all,
>
> I'm doing a undergrad group project where we have to use IDL to code a
> sterographic representation of the solar system. However we have no prior
> knowledge of this language, and so we are a little bit stuck....
>
> We have drawn four globes representing the Earth, moon, mars and the sun
> using the `orb` procedure, and then used a for loop to translate the
globes
> according to a specified orbit, redrawing the view in both the right view
> and left view widgets each time. However this results in a large lag
between
> each update, which ruins the steroscopic effect. Has anyone got any ideas
of
> a faster technique?

The orb object creates an orb that has a fairly large number of facets or polygons. You can use the DENSITY keyword on the orb object to reduce the number of polygons in an orb, which will increase rendering speed at the expense of orb quality. You'll have to play with this value to get to a setting that gives you the best compromise between speed and quality.

A faster graphics card will also help. Make sure that you are using hardware rendering if you have a good card.

David's suggestion of capturing frames and playing them back is good if you still can't get it to run fast enough.

How large are your views? Sometimes large windows take a long time to draw because of the clearing operation between draws. Again, a better graphics card helps here.

> Also, we would like to have a globe, which is internally lit, representing
> the sun. However when we placed a light source inside the orb, its surface
> remained unlit though the other objects were properly lit. Is there any
> simple way of solving this?

I'd try using a spot light. Place it inside of the orbit of the innermost planet, on a line between the viewer and the sun. Aim it at the sun. Keep the spot cone as close as you can to the extent of the sun orb. This won't light the back of the sun, but you can't see that anyway. If some of the light gets past the sun and hits a planet on the other side of the sun, the effect of that light will not be that noticable, since the planet will be getting lit anyway by the light inside the sun.

Hope this helps,
Karl

Subject: Re: 3d graphics
Posted by Rick Towler on Mon, 24 Feb 2003 18:14:13 GMT
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"Dan Madeira" wrote in message ...

> We have drawn four globes representing the Earth, moon, mars and the sun
> using the `orb` procedure, and then used a for loop to translate the globes
> according to a specified orbit, redrawing the view in both the right view
> and left view widgets each time. However this results in a large lag between
> each update, which ruins the steroscopic effect. Has anyone got any ideas of
> a faster technique?

Your biggest problem may be with the orb object (which IMO it was written poorly). The orb object recalculates it's vertices for every SetProperty call. If you are moving your orbs directly you are paying this price. You have two options, you can place your orbs in another model and manipulate that model or you can "fix" the orb (you may want/need to copy orb__define to a local directory before you fix it and you will want to make sure that the fixed orb__define get's called and not the old one). Here is the simple fix:

```
PRO orb::SetProperty, POS=pos, RADIUS=radius, DENSITY=density, _EXTRA=e

   rebuild = 0B

   ; Pass along extraneous keywords to the superclass and/or to the
   ; polygon used to represent the orb.
   self->IDLgrModel::SetProperty, _EXTRA=e
```

```
   self.oPoly->SetProperty, _EXTRA=e

   IF (N_ELEMENTS(pos) EQ 3) THEN BEGIN
      self.pos = pos
      rebuild = 1B
   ENDIF

   IF (N_ELEMENTS(radius) EQ 1) THEN BEGIN
      self.radius = radius
      rebuild = 1B
   ENDIF

   IF (N_ELEMENTS(density) EQ 1) THEN BEGIN
      self.density = density
      rebuild = 1B
   ENDIF

   ; Rebuild the polygon according to keyword settings.
   IF (rebuild) THEN self->BuildPoly
END
```

If this isn't your problem other possibilities could be bad code or bad hardware. Make sure you aren't doing more than you need to when it comes to drawing your scene. Object graphics requires a decent graphics adapter to render all but the simplest of scenes quickly so if you are stuck on an slow machine reduce the complexity of your models as much as possible (use the orb's DENSITY keyword).

You may also want to take a look at my camera object. Spice up that project by moving the viewer thru the solar system. It probably would simplify the creation of the stereographic views too. I have been wanting to try this with a couple of LCD projectors with polarized glasses and lenses for a long time but haven't gotten around to it. Maybe you can put your classmates to shame by presenting your project in this way. Just get back to me and let me know how it went :)

http://www.acoustics.washington.edu/~towler/

> Also, we would like to have a globe, which is internally lit, representing
> the sun. However when we placed a light source inside the orb, its surface
> remained unlit though the other objects were properly lit. Is there any
> simple way of solving this?

Lights don't illuminate the back sides of polygons which is why your sun is

dark whilst your planets are illuminated. Just position another light so that it illuminates your sun. David's suggestion of a directional light oriented towards the sun is good. If you use my camera object you can query it for the viewing vector and use that to orient your light. Easy, if you can get away with a "headlight" setup where the light is positioned the same place as the viewer. If a planet passes between the viewer and the sun you won't be able to do this because the headlight will shine on the dark side of the planet so you'll need to do some extra math to place the light on the view vector inside the smallest orbit.

Do keep your lights to a minimum. Depending on your hardware they can be costly additions.

-Rick

Subject: Re: 3d graphics
Posted by Dan Madeira on Tue, 25 Feb 2003 10:59:42 GMT
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Thanks everyone for the info, we'll try it out asap.

We're using a mac (another thing that we've never used before) with dual Geforce 4 TIs so it should be able to handle anything that we can throw at it... And luckily I'm not working by myself, its a 6 man group project, so I have someone else to share the programming misfortune with.

I suspect you`ll all be hearing about about our other problems in the near future.

Cheers,

Dan Madeira

Subject: Re: 3d graphics
Posted by Karl Schultz on Tue, 25 Feb 2003 15:09:12 GMT
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"Dan Madeira" <d.madeira@ucl.ac.uk> wrote in message news:b3fia0$j4k$1@uns-a.ucl.ac.uk...
>
> Thanks everyone for the info, we'll try it out asap.
>
> We're using a mac (another thing that we've never used before) with dual
> Geforce 4 TIs so it should be able to handle anything that we can throw at
> it... And luckily I'm not working by myself, its a 6 man group project, so

I
> have someone else to share the programming misfortune with.
>
> I suspect you`ll all be hearing about about our other problems in the near
> future.

If you're on a Mac with OS X, then be sure to get the Apple X Server Beta so that you get hardware accelerated graphics. I have a hard time imagining poor graphics performance drawing a few orbs in this configuration.
Hey, if you end up with something that looks cool, we'd love to see a screen shot.

Karl
