Subject: Object graphics polygons
Posted by Steven Chetelat (CS) on Fri, 14 Apr 2000 07:00:00 GMT
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Greetings, all. I'm slowly delving my way into object graphics, and I'm having some pretty serious problems with my lighting. Specifically, I have a set of polygons representing an isosurface of a solid. I generated them using shade_volume. In direct graphics, I used them as input to polyshade, like this:

```
shade_volume, new, .5,vert,poly, /low
shade_volume, new, 1,lvert,lpoly, /low
scale3, xrange=[0,xr], yrange=[0,yr], zrange=[0,zr],ax=xa,az=za
 tv,bytscl(polyshade(vert,poly,/t3d))+bytscl(polyshade(lvert, lpoly,/t3d))
```

I didn't specify any lighting. When I try to get a decent display of the polygons using object graphics like this:

```
shade_volume, full, .5,vert,poly, /low
mypol = OBJ_NEW('IDLgrPolygon', vert, polygons = poly)
mypol -> SetProperty, XCOORD_CONV=[-1.0, 1.0/170.0]
mypol -> SetProperty, YCOORD_CONV=[-1.0, 1.0/79.0]
mypol -> SetProperty, ZCOORD_CONV=[-1.0, 1.0/49.0]
mywindow = OBJ_NEW('IDLgrWindow', DIMENSIONS=[340,158])
myview = OBJ_NEW('IDLgrView', VIEWPLANE_RECT=[-1,-1,1,1], ZCLIP=[1,-1])
mymodel = OBJ_NEW('IDLgrModel')
myview -> Add, mymodel
mymodel -> Add, mypol
mywindow -> Draw, myview
```

The view completely lacks definition. When I add lights, very small sections light up, but I can't seem to position the lights to illuminate the whole object. How can I reproduce the lighting model used by polyshade in direct graphics, or at least get enough intensity out of light objects to suit my purposes?

K-Bye,
STEVE! (chetelat@csee.usf.edu)(steve@moffitt.usf.edu)

Subject: Re: Object graphics polygons
Posted by davidf on Tue, 18 Apr 2000 07:00:00 GMT
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Steven Chetelat (CS) (chetelat@csee.usf.edu) writes:

> I think I've managed to figure this out, right now I have a very simple
> widget program that lets me translate the light across the surface, which

> is part of the reason I feel I'm overlooking something. I can't
> illuminate more than a small fraction of the surface no matter where I put
> the light.

Humm. I don't know. I would guess from the description that
the lights are probably too close to the surface, if they
only illuminate small fractions of the surface. Have you
tried backing them off a bit?

Ambient light is NOT what you want, I think, since this
will light everything up uniformly. You want light that
will show the edges of things.

Cheers,

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

Subject: Re: Object graphics polygons
Posted by Steven Chetelat (CS) on Tue, 18 Apr 2000 07:00:00 GMT
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On Fri, 14 Apr 2000, David Fanning wrote:

> Steven Chetelat (CS) (chetelat@csee.usf.edu) writes:

>> The view completely lacks definition. When I add lights, very small
>> sections light up, but I can't seem to position the lights to illuminate
>> the whole object. How can I reproduce the lighting model used by
>> polyshade in direct graphics, or at least get enough intensity out of
>> light objects to suit my purposes?
>
> Yes, you are going to have to add lights. I'd point you
> to a couple of programs, but it seems my ISP has misplaced
> my FTP directories at the moment. :-(

:-(Thanks for the pointers, nonetheless, I've made definite progress
over the last couple of days... :-)

> The most common problem people have with lighting (aside from
> no training in the theater arts) is that they forget
> their lights also need to be scaled, rotated, translated, etc.

> into the view. You can't just put them *anywhere* and have
> them work. (Well, you *can* put them anywhere in object graphics.
> I guess *that* is the real problem.)

My problem lies in figuring where to put them -- perhaps it is a matter of no training in the theater arts, but all my lights (positional, directional, and spotlights) only illuminate a small portion of my surface, even with intensities set very high. Do I need to modify the ambient lighting as well?

> I like to have a least one or two lights in non-rotatable models
> so that I can rotate a surface underneath them, and sometimes
> one or two lights that rotate with the surface to pull out
> particular surface features.

I think I've managed to figure this out, right now I have a very simple widget program that lets me translate the light across the surface, which is part of the reason I feel I'm overlooking something. I can't illuminate more than a small fraction of the surface no matter where I put the light.

K-Bye,
STEVE! (chetelat@csee.usf.edu)(steve@moffitt.usf.edu)

Subject: Re: Object graphics polygons
Posted by Struan Gray on Wed, 19 Apr 2000 07:00:00 GMT
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Steven Chetelat, chetelat@csee.usf.edu writes:

> My problem lies in figuring where to put them -- perhaps
> it is a matter of no training in the theater arts, but all
> my lights (positional, directional, and spotlights) only
> illuminate a small portion of my surface, even with
> intensities set very high. Do I need to modify the ambient
> lighting as well?

The following code works pretty well as a default setup and simulates semi-directional daylight. It uses the RSI-provided routine SET_VIEW, which sometimes puts the objects in slightly odd positions, but they're always visible.

Assume that you have put your polygon in an IDLgrModel object called theModel, and that you have already created an object graphics window with an ID stored in a variable called mainWindow. Then do this:

```
  ; make a seperate model for the lights, plus default lighting

    lightModel = obj_new('IDLgrModel')
    dirLight = obj_new('IDLgrLight', type=2, location=[1,1,1],
                       intensity=0.7)
    ambLight = obj_new('IDLgrLight', type=0, intensity=0.4)
    lightModel -> Add, dirLight
    lightModel -> Add, ambLight

  ; make a view object and set a default viewplane rectangle

    mainView = Obj_New('IDLgrView', color=[100,100,100])
    mainView -> Add, lightModel
    mainView -> Add, theModel
    set_view, mainView, mainWindow, /do_aspect, /isotropic
```

If you rotate your model the lights will stay put, which is what most users expect to happen. If you want to rotate the lights you can either add them en-masse to your model, or turn them off and use other lights of your own creation.

Struan
