
Subject: Re: coordinates in threedimensional object graphics ?

Posted by [Rick Towler](#) on Mon, 24 Oct 2005 16:31:18 GMT

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> I play around with object graphics and try to build a routine which is
> able to visualize 3d objects of different sizes in th same way.

XOBJVIEW does this. I believe there is an object-ified version
available from the RSI user contrib library which probably adds a good
bit of flexibility.

> When I define the viewplane_rect and the zclip of my view, everything
> works fine before I rotate the view. Then the coordinate system is not
> the coordinate system of the defined axes anymore.

I'm not sure exactly what your issues are. When you rotate the object
does it rotate out of the view?

> Is there an easy way to calculate the coordinates for viewplane_rect and
> zclip from the coordinates of the rotated axes ?

While there probably is a way to do this, you'd be working backwards.
It is best to think of the view as fixed and (unless you are "zooming")
the viewplane_rect as fixed. You operate on the objects contained
within the view, manipulating their transforms to yield the desired
results. So your question is regarding transforming your models in some
way. Maybe you can add some details.

-Rick

Subject: Re: coordinates in threedimensional object graphics ?

Posted by [Klemens Barfus](#) on Mon, 24 Oct 2005 17:24:28 GMT

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Hi Rick,

its exactly the point you mentioned, that the object rotates out of the
view.

The volumes I want to visualize should fit all in the same way in the
view though they have different ranges in x, y and z direction.

When I rotate them around z and y axis I have to fit the viewplane_rect
to get for example a certain frame around the object.

Klemens

Rick Towler wrote:

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Subject: Re: coordinates in threedimensional object graphics ?

Posted by [Rick Towler](#) on Mon, 24 Oct 2005 18:07:39 GMT

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Klemens Barfus wrote:

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> to get for example a certain frame around the object.

O.K. This is easy :)

Rotations are applied about the origin to the world coordinate system. Consider an object with extents 1 by 1 by 1, centered at [5,0,0]. If you rotate the world coordinate system 90 degs about the Z axis, your object will now be at [0,5,0]. If you had a view 2x2 units centered at [5,0,0] the object would be out of view after the rotation.

Translate that same object to the world origin. Now when you apply the rotation, the object doesn't move. It starts at [0,0,0] and ends at [0,0,0]. If you had your view centered about the origin, you would see the object both before and after the rotation.

The general solution involves finding the center and extents of your objects then translating the objects such that they are centered about the origin. RSI provides the `get_obj_range` function (found in C:\Program Files\RSI\IDL61\lib\utilities) which does just this. For bonus points you can use the extents to determine the width and height of your view.

If you have multiple objects you need to rotate, the approach is to translate them to the origin, rotate, then translate them back.

If you are building a viewing system you may want to consider using my camera object. If you're just building a simple viewer it will be overkill, but if you plan on extending it using the camera will give you a lot more flexibility.

You can download it here:

<http://www.acoustics.washington.edu/~towler/RHTgrCamera.html>

-Rick

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Subject: Re: coordinates in three-dimensional object graphics ?
Posted by [Klemens Barfus](#) on Tue, 25 Oct 2005 08:35:54 GMT
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Hi Rick,

thanks for your very helpfull answer !
I think this will help me a lot !

Greetings,

Klemens

Rick Towler wrote:

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> Klemens Barfus wrote:

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