Subject: Re: coordinates in threedimensional 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:

>

Klemens Barfus wrote:

>> 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.

> >

> 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
>
>
>>
>> Rick Towler wrote:
>>
>>>
>>>> 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
```