
Subject: Re: ALIGNING IN PLOT_3DBOX

Posted by [Richard G. French](#) on Sun, 21 Nov 1999 08:00:00 GMT

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"Mark C." wrote:

>
> I have: A $f(x,y,z)$ where $z=f(x,y)$. For the purpose of this discussion, say,
> a straight line in 3D space.
>
> I did: Using Plot_3box, I get a st. line in 3d space. But because of the
> source data, $f(x,y,z)$'s projection on the x-y plane, which is a st. line, is
> NOT parallel to either the x- or the y-axis.
>
> I need: To translate and/or rotate the data so that f 's projection on the
> x-y plane is parallel to either the x- or y-axis.
>
> I am not (yet) familiar with object based graphics. So any suggestion in the
> 'old' or 'traditional' graphics method is appreciated.
>
> Thanks in advance.
>
> Mark C.

Mark - Once you have the projection of the points into the x-y plane,
can't
you simply find the angle with respect to the x axis that the line makes,
and
do a rotation? Let's say that you have two points $x=[1,2]$ and $y=[.1,.3]$
on the
x-y plane. IF you know a priori that all points fall on the line
connecting
these points, you can replace x and y by x' , y' corresponding to
rotating the
points so that they are parallel to the x' axis. You would then plot
 $z=f(x',y')$.

In this example, you would want to rotate the x,y axes counterclockwise
about
the origin by an angle
 $\theta = \text{atan}(y[1]-y[0], x[1]-x[0])$
using
 $x' = x \cos(\theta) + y \sin(\theta)$
 $y' = -x \sin(\theta) + y \cos(\theta)$

If you use this to convert all of your x,y values to x',y' , you will
have
 $f(x',y',z)$ that should have the straight line parallel to the x' axis.

Let me know if this works!
Dick French
