Subject: Re: Z-range
Posted by Ben Tupper on Tue, 14 Dec 1999 08:00:00 GMT
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Xiaoming XU wrote:

> Hi,
>
> how can I set the Z range in the scale of x, y when use surface?
> In other words, how the x,y,z be plotted in the same scale?
>
> Thanks!
>
> Xu

Hello,

I have used the routine AxisScaling (below) with object graphics. I think you might be able to use it to set up the position coordinates that you can specify as a keyword to surface.

Try something like the following:

```
 ; set [XYZ]range values to the min/max of data range you would like to
see
XRange = [0,100]
Yrange = [50, 100]
Zrange = [20, 50]

 ; set [XYZ]position you would like the axes to occupy (of the graphics
space) if
 ; they were all the same data range... these maybe changed by the
scaling process
Xposition = [0.1, 0.9]
Yposition = [0.1,0.9]
Zposition = [0.1, 0.9]


 ;assuming that the xrange or yrange is the largest of all three...
scale the position of the smaller

XYScaling = AxisScaling(Xrange,Yrange, PositionA = Xposition, PositionB
= Yposition)

Print, 'XYScaling:', XYScaling
print, 'Xposition:', Xposition
print,'Yposition:', Yposition
```

```
 ;Using larger of above scales as a baseline, scale the z axis
Case XYScaling[0] of

 1.0 : Zscaling = AxisScaling(Xrange, Zrange, PositionA = Xposition,
PositionB = Zposition)

 Else: Zscaling = AxisScaling(Yrange,Zrange, PositionA = Yposition,
PositionB = Zposition)

EndCase

Print,'Zscaling:',Zscaling
Print, 'Zposition:',Zposition


 ;now set up the postion keyword for 3d graphics
Position = [Xposition[0], Yposition[0], Zposition[0], Xposition[1],
Yposition[1], Zposition[1]]

Please let me know if it works for you.

Ben
--
Ben Tupper
Pemaquid River Company
248 Lower Round Pond Road
POB 106
Bristol, ME 04539

Tel: (207) 563-1048
Email: PemaquidRiver@tidewater.net

;+
; NAME:
; AxisScaling
;
; PURPOSE:
; This function returns a two element scaling vector given two data
ranges.  It is useful
; for determining relative axis lengths.
;
; CATEGORY:
;    Miscellaneous.
;
; CALLING SEQUENCE:
;
; result =AxisScaling( RangeA,RangeB)
;
```

```
; INPUTS:
; RangeA and RangeB are two element vectors of min/max values for each
data range.
;
; OPTIONAL INPUTS:
; None.
;
; KEYWORD PARAMETERS:
; PositionA, PositionB   Two element vectors specifying the location of
each axis (default is [0,1])
; on output, one of the Position Vectors is adjusted to reflect the
scale of  ranges.
;
; OUTPUTS:
; A two element floating point array is returned.   Each element is the
relative
; scaling factor for Ranges A and B respectively.
;
; OPTIONAL OUTPUTS:
; None.
;
; COMMON BLOCKS:
; None.
;
; SIDE EFFECTS:
; None known.
;
; RESTRICTIONS:
; None known.
;
; EXAMPLE:
; Here's the steps to use to scale the axes used for displaying along
600x480 image
; into a dataspace of -.5 to .5 in each direction.
;IDL> RangeA = [0,639]
;IDL> RangeB = [0,479]
;IDL> PositionA = [-0.5,0.5]
;IDL> PositionB = [-0.5,0.5]
;IDL>
 Print,AxisScaling(RangeA,RangeB,PositionA=PositionA,Position B=PositionB)

;      1.00000     0.749609 ; Note that RangeA is larger so it is scaled
at 1.0
;IDL> print,PositionA
;   -0.500000     0.500000 ; Note that PositionA is unchanged since
RangeA is larger
;IDL> Print,PositionB
;   -0.500000     0.249609 ;Note The PositionB is changed...
```

```
; ;its length is 74.9% of axisA's length.
;
; Then go on to normalize the coordinates using David Fanning's
procedure
;
;ScaleA = Normalize(RangeA, Position = PositionA)
;ScaleB = Normalize(RangeB,Position = PositionB)
;
; MODIFICATION HISTORY:
;  Written by: Ben Tupper, 17 SEP 1999
; Pemaquid River Company
; email pemaquidriver@tidewater.net
; tel:  (207) 563 - 1048
; 248 Lower Round Pond Road
; POB 106
; Bristol, ME 04539-0106
;
;  29 SEP 99  Added Aposition,Bposition keywords so new postion coords
can be calculated.
; Oct 1999 Changed its name to AxisScalig from RelativeScaling to
maintain
;  consistency with AxisText, AxisLocate, etc.  Cleaned up the
documentation.
;
;
;-

FUNCTION AxisScaling, RangeA, RangeB, PositionA=PositionA, PositionB =
PositionB

If n_elements(PositionA) EQ 0 Then PositionA = [0,1.]
If n_elements(PositionB) EQ 0 Then PositionB = [0,1.]


DiffA = RangeA[1] - RangeA[0]

DiffB = RangeB[1] - RangeB[0]


Ratio = DiffA/float(DiffB)

Case 1 of

 Ratio GE 1:   BEGIN

    Scaling = [1.0,1./Ratio]
    ;Psition A is unchanged
    PositionB = [PositionB[0],
```

```
((PositionB[1]-PositionB[0])*Scaling[1])+PositionB[0] ]
      END

  Ratio LT 1:  BEGIN

      Scaling = [Ratio,1.0]
      PositionA = [PositionA[0], ((PositionA[1]-PositionA[0])*Scaling[0]
)+PositionA[0] ]
      ;PositionB is unchanged
       END
Endcase


Return, Scaling
End
```