Subject: Re: Need help in IDLgrSurface and vertical exaggeration
Posted by K. Bowman on Thu, 16 Mar 2006 15:04:07 GMT

In article <1142502700.236024.214300@v46g2000cwv.googlegroups.com>,
 raval.chintan@gmail.com wrote:

> Hello,
>
> I am facing some problems with surface object in IDL.
>
> I have DEM Data for ALPS mountain range which I want to visualize as a
> surface and do a flythrough.
>
> Data dimensions are 800x800
> Pixel resolution is of 25 meters
> Minimum height in the data set is 0 meters
> Maximum height is 3500 meters.
>
> I have been able to create the surface out of this dataset but I do not
> get the proper depth perception.
>
> I have even set the projection property to 2 but the mountains
> certainly do not seem to be much of mountains.

The vertical exaggeration is a function of the data space into which you put the
surface. Try this to see the effect of changing the vertical coordinate range:

```
IDL> z = 7.0*dist(800)
IDL> print, min(z), max(z)
     0.00000      3959.80
IDL> isurface, z
IDL> isurface, z, zrange = [0.0, 10000.0]
```

You will need to do something similar with whatever you are using to display the
IDLgrsurface.

Ken Bowman

Subject: Re: Need help in IDLgrSurface and vertical exaggeration
Posted by Rick Towler on Fri, 17 Mar 2006 00:28:21 GMT

raval.chintan wrote:

> I have been able to create the surface out of this dataset but I do not
> get the proper depth perception.

>
> I have even set the projection property to 2 but the mountains
> certainly do not seem to be much of mountains.

This probably has more to do with how you are viewing the data. If you
want a scene to appear realistic, you need to scale everything
accordingly. You most likely have your surface at one scale, and your
viewing system at another.

We can get into all sorts of details but first, how are you viewing your
surface? XOBJVIEW or something you have written?

-Rick

Subject: Re: Need help in IDLgrSurface and vertical exaggeration
Posted by raval.chintan on Fri, 17 Mar 2006 10:54:15 GMT
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Dear Rick,

I have been troubling you a lot for some time but belive me each
interaction (or encounter) with you has always been fruitful and
broadened by knowledge of IDL thank you for that

I have not been able to take time out to build the circuit but your
solution is terrific.

Anyways coming to the point, I am not using XOBJVIEW as you might have
suspected , instead I have been bolder and used IDLitWindow class along
with IDLgrSurface to create my own view the details are as follows:

I have used normalized coordinate system for creating the *system*
VIEWPLANE=[-0.5,-0.5,1,1]
ZCLIP=[-1,1]
EYE=1.01
Projection=2
Color = [20,50,75]

self.oSurfView = OBJ_NEW('IDLgrView', COLOR=Color,$
VIEWPLANE_RECT=viewplane, ZCLIP=zClip, projection = Projection,EYE=Eye)

Next I compute out the Convertion factors for X,Y and Z respectively.
The details for DEM are as follows

;Data dimensions are
xDemSize = 800

yDemSize = 800

```
;Pixel resolution is
GroundResoulution =[ 25,25]  ;in meters
;Minimum height in the data set is
zMin = 0  ;in meters
;Maximum height is
zMax = 3500 ; in meters.

XCnv =[-0.5 ,  1.0/xDemSize]
YCnv =[-0.5 ,  1.0/yDemSize]
ZCnv =[zMin / (zMax-zMin) ,  1.0 / (zMax-zMin) ]
```

since the dataset can be *heavy* on system (although in our test case
it is only 800x800) hence we reduce the data by congriding it and then
create a mesh of the dataset which is 10 units apart

```
DemData = congrid( origDEMData, xDemSize/10, yDemSize/10 )

nDemData=size(DemData)

xData = INDGEN(nDemData[1])*10
yData = INDGEN(nDemData[2])*10
;create the surface object
self.oSurface= OBJ_NEW('IDLgrSurface', DemData, $
        STYLE = 2, Datax=xData, Datay=yData, $
        XCOORD_CONV=XCnv , YCOORD_CONV=YCnv, $
        ZCOORD_CONV=ZCnv)

;create the model
self.oSurfModel = obj_new('IDLgrModel',name ='SurfaceModel')

;add surface to model
self.oSurfModel->Add, self.oSurface

;add the model to our view
self.oSurfView ->add,self.oSurfModel

;Draw the surface on window
self.oWin->draw,self.oSurfView
```

Hope I have not commited any mistakes here! With this code, as I
mentioned, I am not getting any realistic depth perception. I belive
you are right when you say

This probably has more to do with how you are viewing the data. If you
want a scene to appear realistic, you need to scale everything
accordingly. You most likely have your surface at one scale, and your

viewing system at another.

But I am not sure where I am setting the viewing systems scale and how
it is differing from the surface scale I would appreciate if you can
shed some light on this.

With regards
Chintan

Subject: Re: Need help in IDLgrSurface and vertical exaggeration
Posted by David Streutker on Fri, 17 Mar 2006 17:31:37 GMT
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I'm not sure about the depth perception/perspective issue, but my
(possibly incomplete) understanding of the vertical exaggeration is as
follows:

The scaling factor is set by the [XYZ]COORD_CONV keywords. Right now,
your horizontal scaling is:

1.0/(800*25) = 0.00005 (in inverse meters)

while your vertical scaling is:

1.0/3500 = 0.00029

The ratio of these two is about 5.7, which should be your vertical
exaggeration. In order to remove the exaggeration, the second element
of the [XYZ]COORD_CONV keywords needs to be consistent for all
dimensions.

-David

Subject: Re: Need help in IDLgrSurface and vertical exaggeration
Posted by Rick Towler on Wed, 22 Mar 2006 16:14:54 GMT
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David Streutker wrote:
> I'm not sure about the depth perception/perspective issue, but my
> (possibly incomplete) understanding of the vertical exaggeration is as
> follows:
>
> The scaling factor is set by the [XYZ]COORD_CONV keywords. Right now,

> your horizontal scaling is:
>
> 1.0/(800*25) = 0.00005 (in inverse meters)
>
> while your vertical scaling is:
>
> 1.0/3500 = 0.00029
>
> The ratio of these two is about 5.7, which should be your vertical
> exaggeration. In order to remove the exaggeration, the second element
> of the [XYZ]COORD_CONV keywords needs to be consistent for all
> dimensions.

Chintan,

Was this the issue? I've been so busy that I only glanced at your code
and I thought that your *COORD_CONV values might be at fault. I've said
this before, but I try hard to avoid using *COORD_CONV. I always screw
something up if I do...

-Rick