Subject: Re: 3-D scatter plot routines?
Posted by davidf on Thu, 05 Jun 1997 07:00:00 GMT
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Dan Peduzzi writes:

> I have many points of the form (x,y,z) which I would like
> to display using IDL. Ultimately, I would like to fit a
> surface to these data, but because they do not conform to
> any grid, I don't think I can use the SFIT procedure (which
> requires a 2-D array of data to fit.)
>
> Do I have any other options, using IDL 3.5?

Typically, XYZ points must be gridded to a 2D array
to be displayed with the Surface command. This is usually
done with the Triangulate and Trigrid procedures.

Here is an example program from my soon (thank goodness!)
to be complete book that might give you an idea of how this
is done.

Cheers,

David

********** *****

```
   ; Create the random data. Set the seed so you see what I see.

seed = 1L
x = RANDOMU(seed, 32)
y = RANDOMU(seed, 32)
z = EXP(-3 * ((x - 0.5)^2 + (y - 0.5)^2))

   ; Load a color table and create colors for the scatterplot.

LOADCT, 38, NCOLORS=!D.N_COLORS-2
TVLCT, [70,255], [70,255], [70,0], !D.N_COLORS-2
zcolors = BYTSCL(z, TOP=!D.N_COLORS-3)

   ; Set up side-by-side viewing.

WINDOW, /Free, XSize=700, YSize=450
!P.MULTI = [0,2,1]

   ; Set the 3D coordinate space with axes.
```

```
SURFACE, DIST(5), /NODATA, /SAVE, XRANGE=[0,1], $
   YRANGE=[0,1], ZRANGE=[0, 1], XSTYLE=1, $
   YSTYLE=1, ZSTYLE=1, CHARSIZE=1.5, COLOR=!D.N_COLORS-1, $
   BACKGROUND=!D.N_COLORS-2

   ; Plot the random points in 3D space with a diamond shape.

PLOTS, x, y, z, PSYM=4, COLOR=zcolors, SYMSIZE=2.5, /T3D

   ; Connect the data points to the XY plane of the plot.

FOR j=0,31 DO PLOTS, [x(j), x(j)], [y(j), y(j)], [0, z(j)], $
   COLOR=zcolors(j), /T3D

   ; Now grid the data so you can display a surface on top.

Triangulate, x, y, triangles
thisSurface = TriGrid(x, y, z, triangles, /Smooth)
s = SIZE(thisSurface)
xx = Findgen(s(1))/(s(1)-1)
yy = Findgen(s(2))/(s(2)-1)

SURFACE, thisSurface, xx, yy, CHARSIZE=1.5, $
   COLOR=!D.N_COLORS-1, ZRANGE=[0,1]

!P.MULTI = 0

END
 ********************************************************** ***
```

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