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Subject: Re: 2D Interpolation on Irregular Grids  
Posted by [davidf](#) on Tue, 17 Jun 1997 07:00:00 GMT  
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Sumanth Kaushik (skaushik@ll.mit.edu) writes:

> Hi, I have x,y,z data on an irregular grid, and I want  
> to map the z values on the irregular grid to regular grid  
> at (xi,yi). Matlab has such an interpolation routine. Does  
> IDL have a similar routine? or is there a written routine  
> that I someone can e-mail me?  
>

Someday I will have 10 free minutes so I can add this  
answer to my web page. :-)

This is easily done with the Triangulate and Trigrd  
routines. Be sure to read the on-line help for these  
two routines so you are familiar with their many options.

Here is a simple example of how to display randomly  
distributed points in a 3D scatter plot, then grid them  
into a 2D array so they can be displayed as a surface plot.

Cheers,

David

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IDL 5 Reports: <http://www.dfanning.com/documents/anomaly5.html>

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PRO Example

; 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]
```

```
; Draw 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 of it.
```

```
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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