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Subject: Re: what is the best way to do a surface (or 2D) interpolation?

Posted by [paulartcoelho](#) on Wed, 24 Sep 2008 11:01:02 GMT

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hi brian,

thanks for your reply.

krig2d i couldn't make work, it returns a flat new grid with a weird value. but i'll confess that i haven't understood a word of the "Model Parameter Keywords" so i just took the same parameters of the example, duh.

the method in

> "An Alternative Gridding

> Method" section from [http://www.dfanning.com/code\\_tips/griddata.html](http://www.dfanning.com/code_tips/griddata.html).

is giving me promising results. i can obtain a new\_grid that is similar to the original, but i'm struggling a bit with the details now. values that were low in the original grid, say  $\sim 10$  will disappear in the new one, i guess because i have too many zeros around. if i try the cubic=-0.5 suggested in the help to improve the reconstruction, i'll end up with values below 0 in some bins (no negative values in the original). also i noticed that:

```
IDL> print,total(grid)
100.000
```

```
IDL> print,total(new_grid)
61.3827
```

i can re-normalize the new\_grid to 100, but that won't retrieve the lost low values, of course.

> One word of caution is that interpolation is great "inside" the range  
> where you have data, however "outside" the region is extrapolation and  
> is fraught with issues. I mean that your x's  
> IDL> print,vz  
> -1.62839 -1.23045 -0.628389 -0.327359 0.0483046  
> 0.246672  
> and the new x's that you want  
> newx = [-2.0, -1.5, -1.0, -0.5, 0.0, 0.5]  
> some are outside and you need to be a little careful that the answer  
> actually makes sense as if often (maybe stronger than often) doesn't.

you're right. i have several sets of data and some of them can go out to extreme values. but for the data that don't, i'd just need the values there to be assumed to be zero. i thought i could do that just

adding the missing = 0 keyword in interpolate, but if i do that i end up with a flat new\_grid = 0. i wonder now if i should prepare the original data before applying the interpolation, say extend it with zeros myself?

i'm copying below what i'm doing:

```
IN_X      FLOAT   = Array[16]
IN_Y      FLOAT   = Array[6]
GRID      FLOAT   = Array[16, 6]
```

```
IDL> print,in_x
  8.00000  8.14613  8.30103  8.44716  8.60206
  8.74819  8.89763  9.04922  9.19866  9.35025
  9.49969  9.65031
  9.80003  9.94988 10.1000 10.2000
```

```
IDL> print,in_y
 -1.62839 -1.23045 -0.628389 -0.327359 0.0483046
 0.246672
```

```
IDL> print,grid
  0.00000  26.1465  0.00000  0.00000  0.00000
 0.00000  0.00000  0.00000  0.00000  0.00000
 0.00000  0.00000
  0.00000  0.00000  0.00000  0.00000
  0.00000  0.00000  0.00000  0.00000  0.00000
 0.00000  0.00000  0.00000  0.00000  0.00000
 0.00000  0.00000
  0.00000  0.00000  0.00000  0.820449
  0.00000  0.00000  0.00000  0.00000  0.00000
 0.00000  0.00000  0.00000  0.00000  0.00000
 0.00000  0.00000
  0.00000  0.00000  0.00000  0.00000
  0.00000  2.53796  0.00000  0.00000  0.00000
 0.00000  0.00000  0.00000  0.00000  0.00000
 0.00000  0.00000
  0.00000  0.00000  0.00000  0.00000
  0.00000  0.00000  0.00000  0.00000  0.00000
 0.00000  0.00000  0.00000  0.00000  0.00000
 0.00000  0.00000
  0.00000  0.00000  0.00000  61.5708
  0.00000  0.00000  0.00000  0.00000  0.00000
 0.00000  0.00000  8.92427  0.00000  0.00000
 0.00000  0.00000
  0.00000  0.00000  0.00000  0.00000
```

```
out_x = [6.0,6.5,7.0,7.5,8.0,8.5,9.0,9.5,10.0,10.5]
```

```
out_y = [-2.0,-1.5,-1.0,-0.5,0.,0.5]
nx = n_elements(out_x)
ny = n_elements(out_y)
x = Interpol(Findgen(N_Elements(in_x)), in_x, out_x)
y = Interpol(Findgen(N_Elements(in_y)), in_y, out_y)
xx = Rebin(x, nx, ny, /SAMPLE)
yy = Rebin(Reform(y, 1, ny), nx, ny, /SAMPLE)
new_grid = interpolate(grid,xx,yy)
```

> Sorry to hijack your post Paula,

oh, be my guest :)

cheers,  
paula

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