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.

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 <~ 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
                                    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
                                    61.5708
                                               0.00000
   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
    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
```