Subject: interpolation question Posted by chen123.dian on Thu, 20 Apr 2006 04:25:15 GMT View Forum Message <> Reply to Message

Hi, I want to use nearest-neighbor method to interpolate 2-D data. After reading some posters here and idl references, I am still confused how to do. I use a 1-D data to explain my problem. For example, there is x-arrary, [1.0, 2.9, 5.1], the corresponding y-arrary is [10, 50, 80]. Now we want to get the y-values at x-value [0.5, 2.6, 3.1, 4.6] using nearest-neighbor method. The result of y-values should be [10, 50, 50, 80]. Can the IDL function of interpolate.pro do this work? The input of interpolate.pro, X,Y,Z, arrays of numeric type containing the locations for which interpolated are desired, is very confuse. Is there any function like the function interp1 (interp2 for 2-D data) for matlab? Like, y_values=interp1(x, y, x-values, 'nearest', 'extrap').

Thanks in advance.

Chen

Subject: Re: interpolation question
Posted by JD Smith on Fri, 21 Apr 2006 01:57:52 GMT
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On Wed, 19 Apr 2006 21:25:15 -0700, chen123.dian wrote:

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- > any function like the function interp1 (interp2 for 2-D data) for
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Doesn't it depend on how your 2D array is sorted? Are the values along rows and columns always monotonically increasing, e.g.:

0.1 1.2 2.4 0.2 1.3 2.5

Otherwise, the problem is undefined.

That said, I think you are not asking a value lookup problem at all, but a simple 2D interpolation on a regular grid, where instead of linear nearest neighbor intepolation, you want "plain" nearest neihbor. VALUE_LOCATE can do this for you, assuming "nearest in x" and "nearest in y" are separable.. Let 'yarray' be your data array you'd like to intepolate on, and 'curve_x' be the monotonic, but non-regular grid of x positions, and 'curve y' similarly, e.g.:

```
IDL> yarray=randomu(sd,100,100)
IDL> curvex=findgen(100)^2
IDL> curvey=alog10(1.+findgen(100))
```

such that in the 2D 'yarray', all rows have the same X vector coordinates 'curvex', and all the columns the same Y vector 'curvey'. Now you have two vectors describing the X,Y positions in this funny space where you would like nearest neighbor interpolates:.

```
IDL> x=(randomu(sd,10)*100)^2
IDL> print,x
   6544.61
              2552.47
                         2239.70
                                     9695.07
                                                144.029
                                                           919.768
   933.261
              3231.17
                          151.407
                                     761.378
IDL> y=alog10(1.+randomu(sd,10)*100)
IDL> print,y
   1.63828
              1.52555
                          1.80391
                                    0.983095
                                                 1.26320
                                                            1.86245
   1.79494
              1.67543
                         1.89285
                                     1.37616
IDL> xpos=value_locate(curvex,x)
IDL> xpos=round(xpos+(x-curvex[xpos])/(curvex[xpos+1]-curvex[xpos]))
IDL> ypos=value locate(curvey,y)
IDL> ypos=round(ypos+(y-curvey[ypos])/(curvey[ypos+1]-curvey[ypos]))
IDL> interp=yarray[xpos,ypos]
JD
```

Page 2 of 2 ---- Generated from