Subject: Re: Calculate convex hull of scattered data?
Posted by sterner on Mon, 13 Mar 1995 17:13:44 GMT
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art.croucher@jhuapl.edu writes:

> I'm trying to calculate the convex hull which encloses a scattered data
> set. The JHU/APL CONVEXHULL routine didn't work, presumably because
> the data set isn't a polygon. Does anyone have a routine that will
> calculate either a convex hull or a polygon suitable for input to
> CONVEXHULL?

Hi Art,

I wanted to do the same thing but wasn't sure how. Your message inspired me to think about it again, it's very easy. (I don't have a need right now but I'm sure one will come up).

Random x,y points can be preprocessed to put them in a form that the convexhull routine can handle. Here is an example that first generates 100 random points, then preprocesses the points, and finally finds the convexhull. I don't know how far you can puch this as far as number of points goes, 1000 works ok, I'm waiting for 10,000 as I write this (several minutes so far).

```
---------------------------------------------------------- -----
;------  Generate some random scatterplot data  -----
a = randomu(k,100)*360      ; Random angle from 0 to 360 deg.
r = randomu(k,100)          ; Random radius from 0 to 1.
polrec,r,a,/deg,x,y         ; Convert to rectangular.
plot,x,y,psym=2             ; Plot.

;------  Preprocess scatterplot data  --------
xm = mean(x)                ; Find mean of x amd y.
ym = mean(y)
dx = x-xm                   ; Remove means.
dy = y-ym
recpol,dx,dy,r,a            ; Conert to polar form.
is = sort(a)                ; Sort on angle.
a = a(is)
r = r(is)
polrec,r,a,x2,y2            ; Convert sorted values back to rectangular
x2 = x2+xm                  ; Restore means.
y2 = y2+ym

;------  Find the convex hull  ---------
convexhull, x2, y2, xh, yh  ; Find convexhull.
```

```
oplot, xh, yh              ; Plot convexhull (not closed).
------------------------------------------------------------ -----
```

This example assumes you have the JHU/APL/S1R IDL library:
(polrec, recpol, and convexhull)

```
ftp fermi.jhuapl.edu
  login: anonymous
  password: your email address
cd pub/idl
get README
bye
```

The text file README describes what is in the libraries, how to
get them, and how to set them up.

Or see the web page: ftp://fermi.jhuapl.edu/www/s1r/idl/s1rlib/local_idl.html

```
------------------------------------------------------------ -----
```

By the way, 10,000 points did work. It took a few minutes on my
HP 7/35 so I wouldn't want to do too many.

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