
Subject: Re: Polygon hull

Posted by [davidf](#) on Sun, 17 Dec 2000 23:57:45 GMT

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Barbara A Cohen (bcohen@lpl.arizona.edu) writes:

> Hi, I have an array of data and I want to plot a polygon that encompasses
> all the points within it. I have tried JHU's convexhull but it fails to
> encompass all the data (example below). Does anyone else have a program
> to do this?

You can find the convex hull with the Triangulate command, like this:

```
x=[0.36,0.35,0.39,0.42,0.60,0.41,0.48,0.73,0.46,0.42,0.42,0.42, $  
  0.47,0.44,0.47,0.49,0.54,0.64,0.65]  
y=[0.19,0.26,0.26,0.26,0.14,0.22,0.15,0.10,0.16,0.30,0.27,0.27, $  
  0.23,0.23,0.22,0.16,0.16,0.08,0.08]  
TVLCT, [255, 255, 100], [0, 255, 100], [0, 0, 100], 1  
Device, Decomposed=0  
Plot, x, y, color=2, /nodata, background=3  
Triangulate, x, y, triangles, hull  
Plots, [x[hull],x[hull[0]]], [y[hull],y[hull[0]]], Color=1  
Plots, x, y, psym=4, Color=2
```

Cheers,

P.S. I can't tell whether "encompass" means that the points can't exist on the perimeter line. I still can't ftp to the JHU site with a browser. I don't know why. :-(

David

--

David Fanning, Ph.D.

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Coyote's Guide to IDL Programming: <http://www.dfanning.com/>

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Subject: Re: Polygon hull

Posted by [cjengo](#) on Mon, 18 Dec 2000 12:18:28 GMT

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I use qhull for all my convex hull needs. It's extremely fast (< 1-5 seconds) for a few hundred thousand points with less than 8 dimensions. Even comes with viewing software (Geomview), but it's very

easy to read the results into IDL and plot them there. May be overkill for what you're after, but it's simple to use (but can get very complex for complex situations).

<http://www.geom.umn.edu/software/qhull/>

The site also has very good discussions about convex hulls, voronois, etc.

Chris

Sent via Deja.com
<http://www.deja.com/>

Subject: Re: Polygon hull
Posted by [bcohen](#) on Mon, 18 Dec 2000 21:48:56 GMT
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Thanks David and Chris. Triangulate works great. I remade my x and y arrays to include the error in the xy points so that the polygon encompasses them and the actual xy points are within the perimeter, not on it. I love IDL! Long live David Fanning! --Barbara

--

Subject: Re: Polygon hull
Posted by [Mark Hadfield](#) on Mon, 18 Dec 2000 23:47:21 GMT
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"Barbara A Cohen" <bcohen@lpl.arizona.edu> wrote in message
news:91jchs\$ep4\$1@news.ccit.arizona.edu...

> Hi, I have an array of data and I want to plot a polygon that encompasses
> all the points within it. I have tried JHU's convexhull but it fails to
> encompass all the data (example below). Does anyone else have a program
> to do this?

I've just been reading through my brand new copy of David Fanning's "IDL Programming Techniques 2nd Edition" and I came across the following, in a discussion of Delaunay triangulation:

"Note that you can return the convex hull of these points with the TRIANGULATE command too. Simply add a fourth argument to the command...and the points on the parameter [huh? must be perimeter] of this set of points will be returned to you."

Here's an example:

```
x=[0.36,0.35,0.39,0.42,0.60,0.41,0.48,0.73,0.46,0.42,0.42,0.42,0.47,0.44,0.47,0.49,0.54,0.64,0.65]
y=[0.19,0.26,0.26,0.26,0.14,0.22,0.15,0.10,0.16,0.30,0.27,0.27,0.23,0.23,0.22,0.16,0.16,0.08,0.08]
```

```
plot, x, y, color=0, /nodata
```

```
triangulate, x, y, triangles, b
```

```
polyfill, x[b], y[b], color=150, fill_pattern=50
```

```
plot, x, y, psym=7, color=0
```

Mark Hadfield
m.hadfield@niwa.cri.nz <http://katipo.niwa.cri.nz/~hadfield/>
National Institute for Water and Atmospheric Research
PO Box 14-901, Wellington, New Zealand

Subject: Re: Polygon hull
Posted by [davidf](#) on Tue, 19 Dec 2000 00:25:26 GMT
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Mark Hadfield (m.hadfield@niwa.cri.nz) writes:

- > "Note that you can return the convex hull of these points with the
- > TRIANGULATE command too. Simply add a fourth argument to the command...and
- > the points on the parameter [huh? must be perimeter] of this set of points
- > will be returned to you."

Whoops! I'm going to install that damn context checker as soon as I get a stable OS. :-(

Let's just say this has already fixed for the next printing run. :-)

Cheers,

David

P.S. What I don't understand is why I don't look in the book first, instead of spending 45 minutes digging around in my notes. There is even an index entry and everything! Sheesh.

--

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Subject: Re: Polygon hull
Posted by [bcohen](#) on Tue, 19 Dec 2000 13:48:28 GMT
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> I've just been reading through my brand new copy of David Fanning's "IDL
> Programming Techniques 2nd Edition" and I came across the following, in a
> discussion of Delaunay triangulation:

Aha. My book is one of those 80 on order. I think I'll have lots to
learn from it !
Barbara

--

Subject: Re: Polygon hull
Posted by [Pavel A. Romashkin](#) on Thu, 21 Dec 2000 19:14:03 GMT
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Talking about a stable OS... My Win98 is reinstalling at home right now.
Yesterday it found an infrared port (that I don't have *any* hardware
for) and is trying to use it instead of the modem for dial-up. It likes
the idea of the modern IR better than the old primitive ISA modem. I
told you David, Win98 on my PC detects not only what's installed on the
computer, but also what you bring close to it, so it must've detected
that IR remote control for the TV that I forgot in the office. :-(

Cheers,
Pavel

David Fanning wrote:

> P.S. What I don't understand is why I don't look
> in the book first, instead of spending 45 minutes
> digging around in my notes. There is even an index
> entry and everything! Sheesh.

Maybe you should get one, David. Pretty good book. Amazon will deliver it timely :-)

Subject: Re: Polygon hull

Posted by [davidf](#) on Thu, 21 Dec 2000 20:04:34 GMT

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Pavel A. Romashkin (pavel.romashkin@noaa.gov) writes:

> Talking about a stable OS... My Win98 is reinstalling at home right now.
> Yesterday it found an infrared port (that I don't have *any* hardware
> for) and is trying to use it instead of the modem for dial-up. It likes
> the idea of the modern IR better than the old primitive ISA modem. I
> told you David, Win98 on my PC detects not only what's installed on the
> computer, but also what you bring close to it, so it must've detected
> that IR remote control for the TV that I forgot in the office. :-(

Uh, Pavel, I'm sending a couple of guys in white coats over there right now. Don't be alarmed when they show up. They are going to fix this computer for you.

> David Fanning wrote:

>

>> P.S. What I don't understand is why I don't look
>> in the book first, instead of spending 45 minutes
>> digging around in my notes. There is even an index
>> entry and everything! Sheesh.

>

> Maybe you should get one, David. Pretty good book. Amazon will deliver
> it timely :-)

I try to keep a book around, but I'm always feeling sorry for the students (Do you see what they pay for textbooks these days!) and I'm always selling my own copy cheaply. The only problem with this system is the marginalia. Notes like "Who wrote this nonsense!?" and "What a jerk!" does not inspire great confidence. :-(

--

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