
Subject: Re: Strange behavior of POLYFILL
Posted by [Xavi Llorc](#) on Wed, 21 Sep 2011 09:11:21 GMT
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I was meaning POLYFILLV instead of POLYFILL, sorry!

And by the way, I tested on 2 machines:

```
IDL> help, !version, /str
** Structure !VERSION, 8 tags, length=104, data length=100:
  ARCH      STRING  'x86_64'
  OS        STRING  'linux'
  OS_FAMILY STRING  'unix'
  OS_NAME    STRING  'linux'
  RELEASE    STRING  '8.0'
  BUILD_DATE STRING  'Jun 18 2010'
  MEMORY_BITS INT      64
  FILE_OFFSET_BITS
              INT      64
```

```
IDL> help, !version, /str
** Structure !VERSION, 8 tags, length=76, data length=76:
  ARCH      STRING  'i386'
  OS        STRING  'darwin'
  OS_FAMILY STRING  'unix'
  OS_NAME    STRING  'Mac OS X'
  RELEASE    STRING  '7.0'
  BUILD_DATE STRING  'Oct 25 2007'
  MEMORY_BITS INT      32
  FILE_OFFSET_BITS
              INT      64
```

Subject: Re: Strange behavior of POLYFILL
Posted by [David Fanning](#) on Wed, 21 Sep 2011 13:21:58 GMT
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Xavi Llorc writes:

- > After hours fighting against POLYFILLV, I found a strange
- > behavior that I cannot understand...
- >
- > Here there is a small code searching the points inside a triangle. Why
- > there is a point that clearly is inside the triangle and not retrieved
- > by PolyfillV (see plot)? Does anyone have a solution?

I don't have time this morning to look at this very carefully, but I will say that PolyFillV is a **graphic**

solution, not an *analytical* solution. It seems to me you are looking for an analytical solution. If so, there are better ways. IDLanROI is one and here is an article that describes another:

http://www.idlcoyote.com/tips/point_in_polygon.html

Cheers,

David

--

David Fanning, Ph.D.

Fanning Software Consulting, Inc.

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

Sepore ma de ni thui. ("Perhaps thou speakest truth.")

Subject: Re: Strange behavior of POLYFILL

Posted by [Xavi Llord](#) on Thu, 22 Sep 2011 10:41:22 GMT

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Thanks for the answer,

But I also coded an analytical solution. The point is that I need a really fast way to obtain all the points inside a polygon rather than testing one by one.

I have to calculate this for ~1.E6 different polygons in less than 4 minutes and all analytical solutions do not fulfill the benchmark. POLYFILLV does, but giving a wrong answer!!

I ended in this simple polygon (a triangle) that instead of retrieving 10 points is only retrieving 9 (clearly seen in the plot). I do not know if it is really an IDL bug or I'm doing something wrong...

Subject: Re: Strange behavior of POLYFILL

Posted by [David Fanning](#) on Thu, 22 Sep 2011 12:28:18 GMT

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Xavi Llord writes:

> I have to calculate this for ~1.E6 different polygons in less than 4
> minutes and all analytical solutions do not fulfill the benchmark.
> POLYFILLV does, but giving a wrong answer!!

Yes, the price of speed! :-)

Ronn Kling had an analytical solution that could do many points at once and I believe was fast. I can't find it now, and I'm just leaving the office for a few days. You might check on Ronn's web page:

<http://www.kilvarock.com>

Cheers,

David

--

David Fanning, Ph.D.

Fanning Software Consulting, Inc.

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

Sepore ma de ni thui. ("Perhaps thou speakest truth.")

Subject: Re: Strange behavior of POLYFILL
Posted by [Xavi Llor](#) on Fri, 23 Sep 2011 09:48:58 GMT
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Thank you very much for the alternative!

It works (below there is a piece of code comparing against POLYFILLV), but the computational is quite high, specially searching in a large number of points.

In my case (a 1024 by 1024) the overall time goes from ~1.E-5 secs of POLYFILLV to ~2 secs of Ronn Kling's routine, and I cannot afford.

Is this a bug of POLYFILLV? Does anyone experienced similar problems?

Thanks again for your help,
Xavi Llor

```
PRO POLY_HELL_2
dim_x = 1024I & dim_y = 1024I
lon_res = 0.02 & lat_res = 0.02
lon_arr = FINDGEN(dim_x)*lon_res - 12.99
lat_arr = FINDGEN(dim_y)*lat_res + 29.53
triangle_xx = [-4.27, -4.3221145, -4.3234300, -4.27]
triangle_yy = [35.449997, 35.535344, 35.365467, 35.449997]

;
```

```
; POLYFILL calculus
t0 = SYSTIME(/SEC)
xx_n = (triangle_xx - lon_arr[0]) / lon_res +1.
yy_n = (triangle_yy - lat_arr[0]) / lat_res +1.
points_in = POLYFILLV(xx_n, yy_n, dim_x, dim_y)
lap1 = SYSTIME(/SEC) - t0
```

```
DEVICE, DEC=0
LOADCT, 5
WINDOW, 0, XSIZE=800, YSIZE=800, TITLE='RESULT WITH POLYFILL'
```

```
PLOT, triangle_xx, triangle_yy, PSYM=-4, XR=[-4.39, -4.15], XSTYLE=1,
$
  YR=[35.33, 35.57], YSTYLE=1
lon_mat = REBIN(lon_arr, dim_x, dim_y)
lat_mat = REBIN(TRANPOSE(lat_arr), dim_x, dim_y)
OPLOT, lon_mat, lat_mat, psym=1, SYMSIZE=0.7
OPLOT, lon_mat[points_in], lat_mat[points_in], psym=4, SYMSIZE=1.4,
COLOR=115, THICK=2.
```

```
;
```

```
; Ron Kling calculus
t1 = SYSTIME(/SEC)
lon_vals = REFORM( REBIN(lon_arr, dim_x, dim_y), dim_x*dim_y)
lat_vals = REFORM( REBIN(TRANPOSE(lat_arr), dim_x, dim_y),
dim_x*dim_y)
data = TRANPOSE([[lon_vals],[lat_vals]])
connect = REFORM( INDGEN(3),3,1)
points_in_Kling = pointInsideApolygon (triangle_xx[0:2],
triangle_yy[0:2], connect, data)
lap2 = SYSTIME(/SEC) - t1
```

```
WINDOW, 1, XSIZE=800, YSIZE=800, TITLE='RESULT WITH RONN KLING
ROUTINE'
```

```
PLOT, triangle_xx, triangle_yy, PSYM=-4, XR=[-4.39, -4.15], XSTYLE=1,
$
  YR=[35.33, 35.57], YSTYLE=1
OPLOT, lon_vals, lat_vals, psym=1, SYMSIZE=0.7
OPLOT, lon_vals[points_in_Kling], lat_vals[points_in_Kling], psym=4,
SYMSIZE=1.4, COLOR=115, THICK=2.
```

```
PRINT, ''
PRINT, '*** POLYFILL used ' + STRING(lap1,FORMAT='(E9.3)') + '
seconds'
PRINT, '*** Ronn Kling used ' + STRING(lap2,FORMAT='(E9.3)') + '
seconds'
```

END

Subject: Re: Strange behavior of POLYFILL
Posted by [Xavi Llor](#) on Tue, 27 Sep 2011 13:06:46 GMT
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Dear all again,

I've tested massively the POLYFILLV against Ronn Kling's routine and Polyfillv is performing quite a lot of errors...

I wonder if there is a way to report it to ITT, does anyone know how to do it?

Maybe it can be corrected for future versions and we will have the wonderful the exactness of Ronn's routine with the speed of Polyfillv...

Thanks,
Xavi
