Subject: Re: Points in a rectangle with an angle
Posted by K. Bowman on Wed, 05 Apr 2006 16:43:54 GMT
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In article <1144254765.987764.323760@i39g2000cwa.googlegroups.com>,
JJMeyers2@gmail.com wrote:

> Hello,
>
> I have a problem in IDL that I was wondering if anyone has any idea how
> it can be done.
> I have a set of coordinates and I am trying to figure out how many of
> the coordinates are inside a rectangle. I know the coordinates of the 4
> edges of the rectangle but the problem is that the rectangle is at an
> angle in the x,y axis (I know the slope). I can not just say
> coords=where((x LE xmax) AND (x GT xmin) AND (y LE ymin) AND (y GT
> ymax))
> because that will give me coordinates of a rectangle without an angle
> (parallel to the y axis).
> Is there any function in IDL that might be doing that?
>
> Thank you,
> JJM.

If you know the angle of the rectangle, rotate your coordinate system, then use
the simple comparison that you give above.

Ken Bowman

Subject: Re: Points in a rectangle with an angle
Posted by David Fanning on Wed, 05 Apr 2006 16:48:51 GMT
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JJMeyers2@gmail.com writes:

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> it can be done.
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> (parallel to the y axis).
> Is there any function in IDL that might be doing that?

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

Cheers,

David
--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.dfanning.com/

Subject: Re: Points in a rectangle with an angle
Posted by Craig Markwardt on Wed, 05 Apr 2006 16:53:25 GMT
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JJMeyers2@gmail.com writes:
> Hello,
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> I have a problem in IDL that I was wondering if anyone has any idea how
> it can be done.
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> ymax))
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> Is there any function in IDL that might be doing that?

Not really, but it's pretty easy to do yourself.

Assume that the rectangle is centered at (XCENT,YCENT) and has a WIDTH
and HEIGHT in its body coordinate system. Also, assume that the
rectangle is rotated THETA degrees counterclockwise from the "world" X axis.

```
;; Translate to center-of-box coordinates (xp,yp)
xp = x - xcent
yp = y - ycent
;; Rotate into box coordinates (u,v)
u = cos(theta*!dtor)*xp - sin(theta*!dtor)*yp
v = sin(theta*!dtor)*xp + cos(theta*!dtor)*yp
;; Do the selection
wh = where(abs(u) LT width/2 AND abs(v) LT height/2)
```

This takes advantage of the fact that in center-of-box coordinates,
half of the box is left and right of the origin, and above and below
the origin. The only tricky part is getting the signs right, which I

think I did.

Craig

--
---------- ----------
Craig B. Markwardt, Ph.D. EMAIL: craigmnet@REMOVEcow.physics.wisc.edu
Astrophysics, IDL, Finance, Derivatives | Remove "net" for better response
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Subject: Re: Points in a rectangle with an angle
Posted by Rick Towler on Wed, 05 Apr 2006 16:58:26 GMT
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This is the classic point in polygon test. There are two common approaches, the crossing test and the winding test. You can google this for the specifics but here are a few pages to get you started:

http://softsurfer.com/Archive/algorithm_0103/algorithm_0103. htm

I've used this in the past:

http://www.ecse.rpi.edu/Homepages/wrf/Research/Short_Notes/p npoly.html

There are probably ways to IDLize this but I implemented this in a DLM so I never gave it any thought.

I would suggest a 2 stage approach:

first do your rough cull using WHERE to get a subset of points that *may* be in your polygon. Then do the fine cull with a point in polygon test of your choosing. You have a pretty simple case (2d, 4 vertex polygon) so you could get away with a pretty simple test.

-Rick

JJMeyers2@gmail.com wrote:
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> Thank you,
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>

Subject: Re: Points in a rectangle with an angle
Posted by JJMeyers2 on Wed, 05 Apr 2006 17:08:38 GMT
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Thank you all for the swift responses! I see that I have a lot of
options!

JJM

Subject: Re: Points in a rectangle with an angle
Posted by Maarten[1] on Thu, 06 Apr 2006 11:37:32 GMT
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JJMeyers2@gmail.com wrote:

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> the coordinates are inside a rectangle. I know the coordinates of the 4
> edges of the rectangle but the problem is that the rectangle is at an
> angle in the x,y axis (I know the slope). I can not just say
> coords=where((x LE xmax) AND (x GT xmin) AND (y LE ymin) AND (y GT
> ymax))

If you named your variables correctly, that should never return a value
;)

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> (parallel to the y axis).
> Is there any function in IDL that might be doing that?

You may want to check out the IDLanROI object. Works on vectors as
well, even in 3D.

Maarten