Subject: Re: some geometry questions.
Posted by David Fanning on Wed, 29 Mar 2006 23:56:50 GMT
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qian writes:

> If I have 4 random points (x0,y0) (x1,y1), (x3,y3), (x4,y4), is there a
> simple way to decide whether one of them is inside of the triangle
> formed by the other three points?
>
> If none of them is in the triangle by others, how can I connect them in
> order to form a 4 edges polygon, instead of two head on triangles, when
> using order 1-2-3-4-1?
>
> like this:
> 1----2
> \ \
> 4__\3
>
> not like this:
> 1-----2
> \ /
> /\
> / \
> 3-----4

You are looking for a "complex hull algorithm", such as this
one:

http://nms.csail.mit.edu/~aklmiu/6.838/convexhull/index.html

In IDL you can find the convex hull of a set of points
with the TRIANGULATE command:

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

Cheers,

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

Subject: Re: some geometry questions.
Posted by Karl[1] on Thu, 30 Mar 2006 05:29:29 GMT

You might do a google search for "signed areas" and/or see:

http://softsurfer.com/Archive/algorithm_0101/algorithm_0101. htm#Triangles

The idea is to take the vector cross product of something like
(v4-v1)x(v2-v1) and compare it to (v2-v3)x(v4-v3). If the signs of the
z components are different, the lines cross.

A much bigger hammer to use is IDLgrTessellator. If you call the
AddPolygon method with those 4 points and then call the Tessellate
method, the tessellator will always return 2 triangles, but it will
return a 5th point if the lines cross, since the 5th point is needed to
define the point of intersection.

Subject: Re: some geometry questions.
Posted by Craig Markwardt on Fri, 31 Mar 2006 16:50:19 GMT

David Fanning <davidf@dfanning.com> writes:

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David, I'm surprised you didn't refer to your own page, "Is Point Inside Polygon?"

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

I've been using the algorithm you printed there by Krane for several years and it works well. It is vectorized.

Craig

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Craig B. Markwardt, Ph.D. EMAIL: craigmnet@REMOVEcow.physics.wisc.edu
Astrophysics, IDL, Finance, Derivatives | Remove "net" for better response
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