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Subject: Re: Point inside/outside in 3D

Posted by [Steve Hartmann](#) on Mon, 03 Apr 2000 07:00:00 GMT

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Marc,

There is a new object class in version 5.3 called IDLanROI. It contains a member function called "ContainsPoints" that does what you are looking for.

-Steve

marc wrote:

- > I have a closed surface in 3D consisting of polygons.
  - > Is there a routine wich decides if a point lays inside or outside the
  - > surface?
  - > thanks,
  - > :-) marc
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Subject: Re: Point inside/outside in 3D

Posted by [Struan Gray](#) on Tue, 04 Apr 2000 07:00:00 GMT

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marc, m\_schellens@hotmail.com writes:

- > I have a closed surface in 3D consisting of polygons.
- > Is there a routine wich decides if a point lays inside
- > or outside the surface?

Add up the solid angles subtended by the individual polygons. If they sum to  $4\pi$  you're inside, if zero, you're outside. Theoretically, you can detect if you are lying in one of the facet planes by looking for a value of  $2\pi$ , but that requires careful control of under- and overflow errors. A dirtier and more robust approach is to run a simple 2D check first: find the equation of the plane for each face, and then calculate the perpendicular distance to your point - if you're too close for comfort you can then do a 2D polygon inside/outside check (see the tip on [www.dfanning.com](http://www.dfanning.com)).

The new MESH\_XXX routines in 5.3 include a nice one that checks whether your 3D polygon is in fact closed.

Struan

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