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).

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

Struan