Subject: Re: Check if a point is inside a polygon mesh Posted by Rick Towler on Mon, 22 Aug 2005 21:16:36 GMT

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Karl Schultz wrote:

- > On Thu, 18 Aug 2005 03:53:19 -0700, wrote:
- >> Does anybody know a way to figure out if a 3D point lies inside a
- >> closed 3D triangular polygon mesh. The mesh is a tricky engineering
- >> construction of thousands of vertices with holes, stems, supports etc.,
- >> rather than a rectangular slab.

>>

- >> The question arose basically from the task to find the coordinates of
- >> the intersection(s) of a ray with an arbitrary volumetric IDL model.
- >> I've searched the newsgroups but couldn't find a ready answer.

>>

- >> If anyone provides me with information on either problems, I'd be very
- >> grateful.

>

- > One way to do it is to create a point that you know is outside of the
- > mesh. Use that point and the point in question to define a line segment.
- > Then, perform a simple triangle/line-segment intersection check for each
- > triangle in the mesh and keep track of the number of times the line
- > intersects a triangle. If the total number of intersections is odd, the
- > point in guestion is considered to be inside the closed mesh.

>

> Karl

>

I'll add my 2 cents...

I have done a good bit of ray/tri intersection coding and can offer a link and a suggestion. This page will be quite helpful:

http://www.realtimerendering.com/int/

It offers up links to a number of sources regarding different types of intersection. I have played around with Dave Eberly's intersection code as well as much of the Gems code. The Gems stuff is more academic, a starting point whereas Eberly's code is ready to go.

Lastly, you'll want to consider writing this code as a dlm for a couple of reasons. This type of problem requires a good bit of looping which can be a bottleneck in IDL. Also, much of the available code is written in C/C++ and in some cases "porting" would not be trivial.

-Rick