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 question 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