Subject: Re: Efficient calculation of triangle surface areas
Posted by Karl Schultz on Wed, 11 Jun 2003 14:24:50 GMT
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"Wolfgang Funk" <wolfgang.funk@igd.fhg.de> wrote in message
news:newscache$3e8bgh$iih$1@luna.igd.fhg.de...
> Hi all,
>
> I'd like to know the surface area of every single polygon within a mesh.
>
> MESH_SURFACEAREA gives me the cumulative surface area. Is there any
> other way but looping through the connectivity array of the mesh and
> calling MESH_SURFACEAREA for every single polygon?
>
> Thanx,
>
> Wolfgang
>
>
> -----

Here's a program that makes a sample mesh and then computes the area by calling MESH_SURFACEAREA and then computes the area for each individual triangle. I add them up to make sure that the results are the same.

This only works for triangular meshes. If you want something for more general meshes, then the approach below can be extended with some of the ideas in
http://geometryalgorithms.com/Archive/algorithm_0101/algorit hm_0101.htm.

Hope this helps.

Karl

```
pro tri

vol = congrid(bytscl(randomu((seed=0), 4, 4, 4)), 40, 40, 20)
ISOSURFACE, vol, 120, verts, conn
print, MESH_SURFACEAREA(verts, conn)

i = 0L
tot = 0.0
nConn = N_ELEMENTS(conn)

while i lt nConn do begin
   tri = verts[*,conn[i+1:i+3]]
   area = CROSSP(tri[*,0]-tri[*,1], tri[*,2]-tri[*,1])
   area = SQRT(area ## TRANSPOSE(area))/2.0
```

```
    tot = tot + area
    i = i + 4
endwhile
print, tot
end
```