Subject: Re: Simple 3D Visualisation
Posted by Adam Rees on Tue, 16 Sep 2003 20:28:43 GMT
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David,
You're quite right. I think I've just got used to IDLE being able to 99% of the things I ask of it. I have made some progress if anyone is interested. Its not pretty though. I've produced a connectivity array which contains all the possible combinations of points to produce a myriad of triangles (28000 ish polygons). Then searched through and removed all the duplicates taking the total down to 4000 ish. Using mesh_decimate and mesh_validate (I'm 100% sure what these do) I've then decreased the number to 1000 odd. Obviously there are still many I don't need but nonetheless this is low enough for my computer to handle the object easily and thus for me to do most things that I need.
My final problem is that some exterior triangles are facing the wrong way. I think it may have something to do with the directions of the normals at the vertices but that will have to wait until tomorrow. If anyone has any ideas please let me know. I'm spending FAR to much time on this.

All the best

Adam

"David Fanning" <david@dfanning.com> wrote in message news:MPG.19d2394dd3d391e89896ed@news.frii.com...
> Adam Rees writes:
>
>> I'm trying to do something that I thought IDL would handle easily but I'm
>> having real difficulties. I have a set of irregular 3D points (NB: no values
>> at those points). I simply want to produce a 3D volume, most likely a series
>> of polygons/triangles that this set of points defines. I've been using the
>> idlgrpolygon command at present but am having trouble with the connectivity
>> since the points are irregular, i.e. all the vertices are in the right
>> places but the faces are all over the place. Does anyone have any ideas
>> because I'm stumped?
>
> It's always interesting to me what people consider
> to be "easy" problems. But "here are a bunch of
> 3D points with no seeming relationship to one another,
> so I want you to connect them up into something I might
> recognize" seems pretty hard to me. :-)
>

> I mean if you have 100 points, there must be nearly
> !100 ways to do it wrong!
>
> Cheers,
>
> David
>
> --
> David W. Fanning, Ph.D.
> Fanning Software Consulting, Inc.
> Phone: 970-221-0438, E-mail: david@dfanning.com
> Coyote's Guide to IDL Programming: http://www.dfanning.com/
> Toll-Free IDL Book Orders: 1-888-461-0155

Subject: Re: Simple 3D Visualisation
Posted by David Fanning on Wed, 17 Sep 2003 16:27:12 GMT
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Adam Rees writes:

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--
David W. Fanning, Ph.D.
Fanning Software Consulting, Inc.
Phone: 970-221-0438, E-mail: david@dfanning.com
Coyote's Guide to IDL Programming: http://www.dfanning.com/

Subject: Re: Simple 3D Visualisation
Posted by Mark Hadfield on Wed, 17 Sep 2003 20:55:28 GMT
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Adam Rees wrote:
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> way. I think it may have something to do with the directions of the normals
> at the vertices but that will have to wait until tomorrow. If anyone has any
> ideas please let me know. I'm spending FAR to much time on this.

That's not surprising. You seem to be reinventing some very big (3D geometrical) wheels.

You still haven't really explained on what basis you want to join these vertices. Do you have any information you're not telling us about which vertices should be connected?

Anyway, I'm no expert on this stuff, but you might want to have a look at the QHULL procedure. And a Google search on terms like "convex hull" and "Delaunay triangulation" might give you some ideas.

--
Mark Hadfield "Ka puwaha te tai nei, Hoea tatou"
m.hadfield@niwa.co.nz
National Institute for Water and Atmospheric Research (NIWA)

Subject: Re: Simple 3D Visualisation
Posted by Rick Towler on Thu, 18 Sep 2003 04:47:21 GMT
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"Mark Hadfield" wrote...
> Adam Rees wrote:

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>> at the vertices but that will have to wait until tomorrow. If anyone has
any
>> ideas please let me know. I'm spending FAR to much time on this.

Yes, your normals are pointing the wrong way because the windings of those triangles is backwards. Reverse the order (e.g. original is {3,3,2,1} try {3,3,1,2}). I am pretty sure they follow the right-hand rule in IDL but I can't find anything in the docs right now.

> That's not surprising. You seem to be reinventing some very big (3D
> geometrical) wheels.

Very very big. It seems that you have found a solution that suits you and since you don't want to spend a lot of time on this you probably don't want to go too much further. But there are some really cool algorithms out there that can do quite a good job with your data.

> You still haven't really explained on what basis you want to join these
> vertices. Do you have any information you're not telling us about which
> vertices should be connected?

Are there any assumptions that can be made?

> Anyway, I'm no expert on this stuff, but you might want to have a look

> at the QHULL procedure. And a Google search on terms like "convex hull"
> and "Delaunay triangulation" might give you some ideas.

You'll also want to google (both web and groups) for "surface reconstruction", "marching cubes", "deformable models", "shape reconstruction", "volume meshing"... There is a ton of literature on this. You may be able to find code too, but most likely it will be in C/C++.

-Rick
