Subject: Re: XYZ plot + Normal to surface output
Posted by David Fanning on Mon, 07 Jan 2008 15:12:37 GMT
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a.lucas@geolnet.net writes:

> I am a beginner in IDL programing and I am looking for a few
> things :

Of course, you are. All of the impossible questions come
from beginners. Experience brings resignation and the
proper level of expectation. :-(

> 1/ I have some xyz ASCII files and I want to plot them in a 3D view.
> But my X and Y are not regular. Is there any way to plot them firstly
> without any interpolation and secondly using kriging interpolation so
> as to get regular plot.

Irregular data is not a problem. But I would use object
graphics (not necessarily a subject for beginners) to do the plotting.
You could try iSurface, or (if you wanted something you could actually
learn from) you could try FSC_SURFACE:

http://www.dfanning.com/programs/fsc_surface.zip

You could try kriging your data first with KRIG2D, but I've never
used it, and it looks hard to me. (I'm always leery of IDL routines
you have to Google to learn anything about.)

> 2/ I have two files (also in XYZ ASCI format), corresponding to Vx
> and Vy of a velocity field. How can I plot the complet velocity field
> with vectors in 2D and draped on a 3D surface ?

Well, this is an ADVANCED topic, for sure. I'm not sure how I would
do this. Maybe later I'll have a chance to think about it more.
STREAMLINE comes to mind, and it is easy enough to draw lines
in 3D, but something that looks good... I don't know. Maybe
the more advanced users in the group will have some ideas. :-)

> 3/ Using two XYZ files (ASCII format), If I plot them in the same
> frame I thus get two surfaces S1 and S2. I want to output the
> difference between S1 and S2 but in the normal frame of S1 (in this
> case S1 is below S2). Imagine 2 topographies where S1 is below S2.

I think I would just do something like this:

IDL> FSC_Surface, S2-S1

You might have to grid your XYZ data to get these surfaces.
If it is an easy job, something involving TRIANGULATE and TRIGRID
will probably work. If it is more complicated, I would look at
GRIDDATA.

Take it slowly. In 15-20 years you might have enough experience
to solve this problem. ;-)

Cheers,

David

--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.dfanning.com/
Sepore ma de ni thui. ("Perhaps thou speakest truth.")

Subject: Re: XYZ plot + Normal to surface output
Posted by Rick Towler on Mon, 07 Jan 2008 23:19:49 GMT
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David Fanning wrote:
> a.lucas writes:

>
>> 1/ I have some xyz ASCII files and I want to plot them in a 3D view.
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> Irregular data is not a problem. But I would use object
> graphics (not necessarily a subject for beginners) to do the plotting.
> You could try iSurface, or (if you wanted something you could actually
> learn from) you could try FSC_SURFACE:
>
> http://www.dfanning.com/programs/fsc_surface.zip

Yes, object graphics is definitely the way to go.

>> 2/ I have two files (also in XYZ ASCI format), corresponding to Vx
>> and Vy of a velocity field. How can I plot the complet velocity field
>> with vectors in 2D and draped on a 3D surface ?
>
> Well, this is an ADVANCED topic, for sure. I'm not sure how I would
> do this. Maybe later I'll have a chance to think about it more.

> STREAMLINE comes to mind, and it is easy enough to draw lines
> in 3D, but something that looks good... I don't know. Maybe
> the more advanced users in the group will have some ideas. :-)

You could do this one of two ways.

The easy way would be to generate a texture map of your vectors and apply that to your IDLgrSurface object. You'll want to look at the TEXTURE_HIRES keyword and consider your hardware capabilities when going this route. It may work, or it may look terrible. But it is easy.

The other way would be to create a vector field object that is a subclass of IDLgrModel that accepts your vector data, as well as the IDLgrSurface object as inputs and for each vector it extracts the Z data for the head and tail of the vector and draws a vector at each grid point. You would of course have to extract the surface Z value at the vector tail and all of the neighboring points, determine the two neighboring points the head falls between, calculate the normal of the polygon bound by the tail point and these points, calculate the Z value of the head based on the magnitude of the vector, draw the vector with the head orthogonal to your normal, then shift the vector up in Z just a smidgen so it floats just above your surface. This would give you the best looking results but takes more effort up front. It would be *much* easier if you were working with data on the same grids but I don't think it is required.

-Rick
