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Subject: Re: impossible?: overlaying lineplots on surface-plots

Posted by [davidf](#) on Sun, 14 Jan 2001 16:45:56 GMT

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Harald von der Osten-Woldenburg (hvdosten@lb.netic.de) writes:

>  
> with oplot I tried to sketch some paths where only (x,y) coordinates are  
> available on a digital elevation plot (based on the same (x,y)  
> coordinates) created by shade\_surf. The results are not satisfying:  
> first of all, the stretching factors in x and y are obviously different  
> from the factors used by shade\_surf (there is only one create\_view in  
> the program, I thought this should fit to all lines following?). But I  
> am wondering if it would be possible to sketch the lines directly on the  
> surface plot, as it is possible with SURFER from Golden Software, for  
> example?  
>  
> Thank you for each tip also for those like: "crazy man, you try to make  
> impossibilities possible".... ;-)

Well, this one is definitely not impossible. But not especially easy either. :-)

I've never used Create\_View to set up the 3D transformation matrix. I usually use SCALE3 or the SURFACE command itself. But in any case, the character sizes used for the SURFACE command and for the OPLOT command inside the Z-buffer (where you are going to do this) are not quite the same. (At least they didn't used to be. I haven't checked this in IDL 5.4.) This means that if you allow IDL to choose the margins of the plot, you can have problems aligning your OPLOT coordinates with your surface plot. To get around this problem I set the CHARSIZE keyword on *every* graphics command.

So, here is how I would do something like this.

(1) Do it in the Z-buffer. This takes care of hidden line and surface removal for you automatically. This is almost always what you want, but you have to be a bit careful. If your line and the surface are co-incident, then your line will look "patchy". The problem is that round-off in the Z-buffer will sometimes place the surface in front of the line, and sometimes the line in front of the surface. Usually, you have to "fudge" the line a bit to get it slightly off the surface, so it can be displayed properly. Don't worry, you are doing "visualization" here, not science. :-)

(2) Use the SURFACE command to create the T3D matrix. Use the SAVE keyword to save the matrix for the next OPLOT command. Set CHARSIZE=1.0.

(3) Use the OPLOT command to draw the line. (To tell you the truth, I've never used OPLOT in this case. I always use PLOTS, but I can't think of a good reason OPLOT wouldn't work. The SURFACE command should set the proper system variables. But if it doesn't for some reason, try PLOTS.) Be sure you set the T3D keyword, and you might have to supply a Z value to put the line where you want it. Set CHARSIZE=1.0.

(4) Take a snapshot of the Z-buffer and display the result on your display. It should be perfect. Well, probably after 10-12 iterations it should be perfect. But you get the idea. :-)

Cheers,

David

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Subject: Re: impossible?: overlaying lineplots on surface-plots  
Posted by [Harald von der Osten-\[1\]](#) on Mon, 15 Jan 2001 00:43:13 GMT  
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Hi David,

thanks again for your answer. Following your suggestions I will receive the plot with several lines in a layer with constant Z, if I understand it correct. I would like to make quite strange things: I would like to force the lines (where only [x,y] and no z's are available) following the topography of the corresponding surface plot. Is it possible to work somehow with the T3D matrix, something like: adopting the z-value in this matrix stored at the location [x,y], so that the lines are plotted on the surface of the surface-plot?

Thanks a lot for each hint and - good night (it's time now to leave the PC....)

Harald

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Subject: Re: impossible?: overlaying lineplots on surface-plots

Posted by [davidf](#) on Mon, 15 Jan 2001 02:04:55 GMT

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Harald von der Osten-Woldenburg (hvdosten@lb.netic.de) writes:

- > thanks again for your answer. Following your suggestions I will receive
- > the plot with several lines in a layer with constant Z, if I understand
- > it correct. I would like to make quite strange things: I would like to
- > force the lines (where only [x,y] and no z's are available) following
- > the topography of the corresponding surface plot. Is it possible to
- > work somehow with the T3D matrix, something like: adopting the z-value
- > in this matrix stored at the location [x,y], so that the lines are
- > plotted on the surface of the surface-plot?

Yes, exactly. But you will have to raise the line  
\_slightly\_ above the surface in order to see it properly.

Cheers,

David

--

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