Subject: Re: IDL for 3D image processing?
Posted by David Foster on Wed, 13 Mar 1996 08:00:00 GMT
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peterv@mpc186.mpibpc.gwdg.de (Peter Verveer) wrote:
>
> Dear IDL users,
>
> I have seen the IDL demo and I am quite impressed. However, before
> considering using IDL, I would like to know the following:
>
> Is IDL suited for 3D image processing? Are there 3D equivalents to
> operations such as the 2D fourier transform and convolution?
>
> I would apply IDL for processing 3D microscopy data . Has IDL been
> applied in this field, or in 3D medical image processing or
> tomography, which are similar fields?
>
> I would be very much interested in hearing experiences/opinions on the
> usability of IDL for 3D image processing.
>

We use IDL exclusively for the analysis of magnetic-resonance brain scans. I know of at least several other groups that are using IDL for this same purpose. In a general sense, IDL is very suited for dealing with array-oriented data. There are many functions that are extremely useful in this respect.

I can't comment much on such operations as fourier transforms or convolutions on a 3D data-set, but one of IDL's strengths is that it allows you to call modules written in C or Fortran. We've used this to enable our own image-compression and 3D filtering routines.

If you have a demo copy then look through the function listings and see if it has what you would need. It IS true that if there is something that you need to code from scratch that involves any iterative processes, then you will need to code this in C or Fortran; IDL is "compiled" into a pseudo-code that is then interpreted, so coding an iterative process in IDL is VERY slow. Don't let this alarm you -- the array operations in IDL are usually all that you need (and they're optimized!).

Feel free to email if you have any questions.

Dave Foster
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Subject: Re: IDL for 3D image processing?
Posted by Ken Kump on Wed, 13 Mar 1996 08:00:00 GMT
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Peter Verveer wrote:
> Is IDL suited for 3D image processing? Are there 3D equivalents to
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I am an IDL user applied to medical image processing, not microscopy.
To be frank, I find IDL4.0 difficult to do 3D work.
Let me clarify. Many of the routines
are there, but they are somewhat cumbersome. For example, I take
a 3-D MRI volume data set and would like to do a skin-surface
rendering. It is possible using either slicer.pro (a widget-based
package) or using more direct means with shade_volume. It is
difficult to manipulate the object and put arbitrary cuts into it.
The tools are there, you need to spend the time to write an
optimized, slicer-like routine..but other packages are avail which
already have this built-in.

Most functions are extendable to 3D. The image processing functions
are limited, but I hear that ver 5 will fill in this void.
I think IDL is nice in that there is a fair amount of flexibility
and some power. I find it more optimized for 2-D stuff. There are
some nice visualization tools, animators, and widgets. There is
not, as far as I know, a Radon Transform, for example (although I
have implemented several algorithms) to do tomography.

I find IDL a "nice" environment to do processing and display.
It is straightforward to include your own, optimized C/FORTRAN code
which I use often. Your decision really should depend upon your
needs (eg: Matlab (1D, 2D signal processing/optimization),
AVS (good 3D but more for developing applications than research), ...).
Good luck,

Ken Kump

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