Subject: Ongoing Object Graphics Quest
Posted by David Fanning on Mon, 19 Nov 2001 01:23:42 GMT
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Folks,

I've been on a bit of a quest lately to learn more about object graphics. I continue to be amazed at how hard it is to figure everything out. Partly this is because object graphics are so haughty. When you make an absolutely asinine mistake, they just stare at you with this incredibly disgusted look on their face. They don't say *anything*, unlike direct graphics, which sometimes deign to send you a cryptic error message that can occasionally get you back on track.

We spend an inordinate amount of time just staring at each other, although I usually have more of a blank look on my face than an intimidating one. :-(

Anyway, to solve a problem for a client, and to give myself a challenging programming exercise I decided to work on an image processing application that would allow me to interactively set the contrast/brightness (also called the window/level) of an image. Several weeks ago I reported on a similar program I had written in direct graphics. (That direct graphics program, WindowImage, has been upgraded, incidentally, as a result of lessons learned in the past couple of days.)

Because I has already *mostly* solved the contrast/ brightness problem and I (naively) believed that converting that to object graphics wouldn't be much of a challenge, I decided to make the problem more difficult. I also wanted to be able to zoom the image "in place", and in a way that preserved the aspect ratio of the zoomed image subset. This was a bigger challenge because laying things out in object graphics windows (at least according to all the examples RSI provides and my own experience) is one gigantic pain in the ol' wazoo. I wanted to develop a rational way of doing this that I could explain to someone.

Finally, I wanted to know how to have several

"views" of data in one graphics window, and how
to interact with those views independently. (Had
I thought about this for longer than five minutes I would
certainly have given the whole project up as hopeless
before I went to all this trouble.)

The result is a new program on my web page, named
ContrastZoom.

http://www.dfanning.com/programs/contrastzoom.pro

There are three "views" in the window. The view on
the left is the zoom window. You can draw a rubberband
box about a portion of the image that you want to
see closer up. Although I don't zoom into the image,
I take that portion and display it in the same location
in the graphics window in a way that preserves its
aspect ratio. I call this "zoom in place", because
the effect is to zoom into a particular location. You
can go back to the entire image by just clicking and
releasing the cursor in that window.

The center "view" or image is the image that you
use to adjust the contrast/brightness of the
image. Dragging the cursor horizontally sets the
brightness or level. Dragging the cursor vertically
sets the contrast or window. Clicking and releasing
will set the original values of 25% contrast and
75% brightness.

What I particularly like about this program is that
the colorbar in the third "view" on the right
reflects the current window and level. I know
I will offend you medical guys with some color,
but the rest of us can see this better by running
the program with a red-temperature color table like this:

IDL>ContrastZoom, Colortable=3

I understand that this is not the best program I've
even written. But I spent most of 10 days writing it,
and I think even as it is, it might save someone else
a heck of a lot of time. I already have ideas for how
the program can be improved if I decide to put the
lessons learned here in a book.

(By the way, I didn't get anyone responding with
suggestions for improving my previous contrast/brightness

algorithm, so I had to do it myself. I'm still not
totally in love with it, but it's getting better
every time I work on it. At least with the color bar
feedback, I can tell it works now the way I expect
it to work. That's something, anyway.)

As always, I appreciate the feedback.

If you haven't visited my web page in a while,
you can find several new programs at the usual place:

http://www.dfanning.com/documents/programs.html

Cheers,

David

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David W. Fanning, Ph.D.
Fanning Software Consulting
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