Subject: Significant Update of cgImage
Posted by David Fanning on Sun, 04 Dec 2011 17:58:47 GMT
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Folks,

I wanted to alert you to a couple of significant feature updates to cgImage.

As I work on my map projection book, I have been using a lot of GeoTiff images. These images are easy to navigate and georegister, and I have developed software that can read a GeoTiff file and display the image with map annotations, etc. All of that works nicely.

The problem is that many of these Tiff images are low contrast, have missing data values in them, etc. This is the problem that is addressed in this update of cgImage.

I have modified cgImage so that if you are displaying a 2D image array (this does NOT apply to 24-bit color images!) you now have the ability to scale or stretch these images eight different ways. Basically, you now have the stretching capability of XStretch directly in cgImage. What this means is that not only can you do a straight linear scaling of the data before display (the purpose of the old SCALE keyword), but you can also do Log, Gamma, and Gaussian scaling, do histogram clipping in various ways, etc.

For example, many of these images look best when a two percent histogram clipping is used (e.g. ClipScl). This is the same default clipping that ENVI uses. You can affect such a clip like this:

```
IDL> cgImage, image2d, Stretch="CLIP"
```

Possible values for the STRETCH keyword are: LINEAR, CLIP, GAMMA, LOG, ASINH, SQUAREROOT, EQUALIZATION, GAUSSIAN, and MODIS. Alternatively, you can use index numbers in place of these names. In other words, the command above can also be written like this:

```
IDL> cgImage, image2d, Stretch=2
```

The old SCALE keyword simple chooses a LINEAR stretch. Additional keywords are added that will set the parameters

for the different stretches available.

Another problem with many GeoTiff images is that they
have missing data in them. So cgImage has also been modified
with three additional keywords to allow you to handle this
missing data appropriately. These keywords are:

Missing_Value - Used to specify the missing data value in the image.
Missing_Index - Specify the missing index in the output image.
Missing_Color - Specify color of the missing data in output image.

Suppose, for example, missing data is indicated by the value
-32767 and you would like to display this missing data in a
white color using color index 255 (the default missing color
index). Then you could set up and display your image like this:

```
IDL> cgLoadct, 33, NColors=254
IDL> cgImage, image2d, Missing_Value=-32767, Missing_Color='white', $
     Stretch="LINEAR"
```

The missing data values are now set to !Values.F_NAN before the
scaling is done. The scaling is done into the values 0 to 254.
Then the missing data indices are set equal to 255, the
missing value index. The resulting image shows the missing
values in the color you specify.

I want to mention one other change. I often want to display
these images in graphics windows having the same aspect ratio
as the image itself. A new DISPLAY keyword to cgImage will
create such a graphics window for me and display the image in
that graphics window. If the DISPLAY keyword is used with
the WINDOW keyword, and new cgWindow will be created. Otherwise
the graphics window will be created with cgDisplay.

```
IDL> cgImage, image2d, Missing_Value=-32767, Missing_Color='white', $
     Stretch="LINEAR", /Display, /Window
```

If a cgWindow is opened in this way, the aspect ratio of the
window is confined to the aspect ratio of the image as the
window is resized.

A number of other routines were slightly modified to work
smoothly with new functionality in cgImage. This would
be a good time to update your Coyote Library:

http://www.idlcoyote.com/programs/zip_files/coyoteprograms.z ip

You can read about the new keywords in the updated cgImage

documentation:

http://www.idlcoyote.com/idldoc/cg/cgimage.html

Cheers,

David

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