Subject: Re: what is an efficient lossless compression way to store a gray-scale image
Posted by George N. White III on Wed, 27 Aug 2003 22:52:02 GMT
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On Tue, 26 Aug 2003, Xiaoying Jin wrote:

> Hi, there,
>
> For a gray-scale image, I haven't found a good way to store it yet. It
> seems that there is no way to store gray-scale images in IDL
> efficiently. If so, that will be too bad, because all the satellite
> images we processed are very large and occupy a lot of space.
>
> I tried 'tiff' format with Packbits compression, but it does not help
> for gray-scale image. Sometimes the file size of the compressed image
> is even larger than the original raw data!!!
>
> Can anyone give me some hint? Thank you very much!

In general, rather than creating image for viewing data, it is preferrable to preserve the original data and provide tools to view the data "directly". You may, however, want some low-resolution "browse" images. By viewing the actual data files you reduce the disk space devoted to multiple copies of the same information in different formats, but also the problems that arise in trying to interprete images when you don't have ready access to the actual data values or geographical coordinates.

In retrospect, the smart approach would have been to define satellite data formats (e.g. TDF, HDF) as a "subset" of TIFF and then provide Photoshop plugins. This would have satisfied the people who "just want some images" to look at".

Some compression methods require a non-free license, but the PNG format uses a "free" algorithm. You can use an image format without compression or write a raw data file and then apply one of the many file compression tools (zip, gzip, etc.). IDL has a /compress keyword that supports gzip compression, but (on a decent OS) you can use other methods by writing data to a named pipe "connected" to an external compression program.

How much compression you get depends on the data, so it may pay to run tests on your images. Satellite images are often noisy. You may get 12 bits-per-pixel (bpp), but if the bottom 4 bits are random the file won't compress well. In that case, converting the file to 8 bpp may not loose much information, but would substantially decrease the raw file size and producing better compression.

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