Subject: Re: IDL EPA Exam Test Question
Posted by davidf on Wed, 30 Aug 2000 07:00:00 GMT
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Craig Markwardt (craigmnet@cow.physics.wisc.edu) writes:

> When you take the FFT of an image the meaning of coordinate axes
> change.

Thank you, Craig. A *special* hug and a kiss for you!

Cheers,

Craig

--
David Fanning, Ph.D.
Fanning Software Consulting
Phone: 970-221-0438 E-Mail: davidf@dfanning.com
Coyote's Guide to IDL Programming: http://www.dfanning.com/
Toll-Free IDL Book Orders: 1-888-461-0155

Subject: Re: IDL EPA Exam Test Question
Posted by Craig Markwardt on Wed, 30 Aug 2000 07:00:00 GMT
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davidf@dfanning.com (David Fanning) writes:
> This is actually a serious question that I was
> asked today from one of my e-mail friends. I know
> it is used to build "frequency images", but what
> are those and how does a DIST image work in that
> context?

When you take the FFT of an image the meaning of coordinate axes change. In a transformed image, the coordinates label the *frequency* of each pixel. The FFT attempts to decompose the image or signal into oscillating sine waves with various frequencies; the result is the amplitude of each wave.

In a 1D transformed image, pixel 0 is the DC amplitude, pixel 1 is the amplitude of the slowest varying wave, and so on for higher frequency waves. For a 2D transformed image you have both an "X" frequency and a "Y" frequency -- a frequency "image." The fourier transform also keeps track of "negative" frequencies, which for some reason are kept in the second half of the vector.

DIST computes the frequency of each element in such a 2D transformed

image --- or at least is proportional to it. This would be useful if you are applying filtering in the frequency domain. For example if you wanted to apply an exponential filter to attenuate the high frequency amplitudes in a 128x128 array, you might do this:

freq = dist(128,128)
fim = fft(im)*exp(-freq)

Craig

--
---------- ----------
Craig B. Markwardt, Ph.D. EMAIL: craigmnet@cow.physics.wisc.edu
Astrophysics, IDL, Finance, Derivatives | Remove "net" for better response
---------- ----------

Subject: Re: IDL EPA Exam Test Question
Posted by davidf on Wed, 30 Aug 2000 07:00:00 GMT
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Andy Loughe (loughe@fsl.noaa.gov) writes:

> As it says in the on-line help (no kidding)...
>
> "Making pretty pictures."
>
> Do I win?

Yes, Andy. And you get the same prize I give my children when they win these kinds of contests: a hug and a kiss! :-)

This is actually a serious question that I was asked today from one of my e-mail friends. I know it is used to build "frequency images", but what are those and how does a DIST image work in that context?

Cheers,

David

P.S. Let's just say I hope I run into you on the Mall when it comes time for payment. :-)

--
David Fanning, Ph.D.

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Subject: Re: IDL EPA Exam Test Question
Posted by Andy Loughe on Wed, 30 Aug 2000 07:00:00 GMT
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David Fanning wrote:
>
> Hi Folks,
>
> The Exam Committee chairman has run off with the
> secretary over in the Bookstore and no one seems to
> know when he is coming back. So I've been asked to
> get a couple of exam questions together. I don't want
> to be unfair or anything, so I thought I would throw
> out a test question to see if I'm on the right track.
>
> Ready?
>
> What is the *real* purpose of the DIST function?

As it says in the on-line help (no kidding)...

"Making pretty pictures."

Do I win?

--
Andrew Loughe ==========
NOAA/OAR/FSL/AD R/FS5 | email: loughe@fsl.noaa.gov
325 Broadway | wwweb: www-ad.fsl.noaa.gov/users/loughe
Boulder, CO 80305-3328 | phone: 303-497-6211 fax: 303-497-6301

Subject: Re: IDL EPA Exam Test Question
Posted by Struan Gray on Thu, 31 Aug 2000 07:00:00 GMT
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David Fanning, davidf@dfanning.com writes:

> The Exam Committee chairman has run off with the
> secretary over in the Bookstore and no one seems to

> know when he is coming back. So I've been asked to
> get a couple of exam questions together.

Hmmm. Now we all know the answer you're going to have to think of a better one. Actually, you already have. A standard goat-from-sheep sort algorithm is to ask the interviewee what they would ask if they were the interviewer. You've already done that. Game over.

Thing is. Did you know I knew you knew I know?

Struan
