Subject: Re: Image error calculation
Posted by cgguido on Thu, 01 Apr 2010 02:39:46 GMT
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On Mar 31, 9:10 pm, Suguru Amakubo <sfa2...@googlemail.com> wrote:
> Hi I basically have a 400x400 jpg image that I have obtained by
> combining 22 similar images. I am currently trying to determine if the
> new image produced is better in quality than the original image that I
> used as a base.
>
> (With my extremely limited knowledge of images) I have tried to do
> this by using the statistic command and looking at the standard
> deviation (hence error of image). However I do have an alarming sense
> that I am running into a mistake.
>
> Would it be possible if anyone could tell me what IDL procedures or
> methods you use to determine 'image quality' quantitatively?
>
> Thanks for your help in advance
>
> Suguru

Hi Suguru,

Can you tell us **in words** what you would consider a good image and
a bad one? If you can't state your criterion in words, there is no
hope to find an IDL solution, or a solution in any other computer
language. Also, how did you combine the 22 images?

Gianguido

Subject: Re: Image error calculation
Posted by Suguru Amakubo on Thu, 01 Apr 2010 03:07:36 GMT
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Sorry about that, what I will consider to be a better quality image is
that the details of the structures (DNA) could be identified better.

So in a nutshell if I see the new image and see more details that was
previously unidentifiable (due to partial bluring) that I consider to
be a better image. A 'sharper' image will probably best describe it.
However the problem lies in quantifying it. (Since saying this image
looks better just won't do. It needs to be: e.g. x % better than the
original image).

As for the how I made the image, I basically used one image as a
'base' and the took 22 different images of the same DNA that was taken

immediately after each other and then split the new image into smaller subset images and mathematically found a point that is considered to be similar and placed it on top of it (then divided to get the end image).

My aim therefore is to compare the base image with the new image and determine quantitatively by what degree the image has improved.

Sorry about the lack of explanation. Please tell me if the above needs explaining further.

Suguru

Subject: Re: Image error calculation
Posted by Maxwell Peck on Thu, 01 Apr 2010 07:42:12 GMT
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I have a feeling there is probably a 'proper' way to do this but perhaps you could use something like Sobel edge detection filter (http://idlastro.gsfc.nasa.gov/idl_html_help/SOBEL.html) which calculates the magnitude of the gradients in the image. Sharper lines I would think have a larger gradients than blurred areas so perhaps a difference between the Sobel detected 'improved' image and the Sobel detected original image may give some indication? I'm not sure if you'd have to average the result somehow because of the blurring itself though...

Max

On Apr 1, 2:07 pm, Suguru Amakubo <sfa2...@googlemail.com> wrote:
> Sorry about that, what I will consider to be a better quality image is
> that the details of the structures (DNA) could be identified better.
>
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> explaining further.
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> Suguru

Subject: Re: Image error calculation
Posted by Craig Markwardt on Thu, 01 Apr 2010 16:15:46 GMT
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On Mar 31, 11:07 pm, Suguru Amakubo <sfa2...@googlemail.com> wrote:
> Sorry about that, what I will consider to be a better quality image is
> that the details of the structures (DNA) could be identified better.
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If you have a signal-free region of your image, you could calculate
the image noise "before" and "after," and show that the noise was
reduced.

However, you mentioned the use of JPEG formatted images. Since the
data values of JPEG images are not calibrated, you will have a hard

time quantifying the amount of exact improvement. Or rather, I should say that JPEGs are calibrated to human perceptual levels which are non-linear (sRGB, Adobe RGB, etc), rather than photometric levels. Better to use TIFF, or at the very least, use JPEG with some agreement with the maker about what the data values mean from a photometric standpoint.

Craig

Subject: Re: Image error calculation
Posted by Brian Daniel on Thu, 01 Apr 2010 16:22:22 GMT
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Image quality is a current field of research. Check out SPIE or OSA journals if you're really interested in more detailed metrics. If you're not, I suggest taking the root mean squared error between your images. IDL's element by element algebra is very handy for this.

Best,
Brian

On Apr 1, 3:42 am, Maxwell Peck <maxjp...@gmail.com> wrote:
> I have a feeling there is probably a 'proper' way to do this but
> perhaps you could use something like Sobel edge detection filter
> (http://idlastro.gsfc.nasa.gov/idl_html_help/SOBEL.html) which
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