Subject: Re: Finding the mean of a set of images
Posted by Craig Markwardt on Tue, 22 Oct 2002 13:33:02 GMT
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David Oesch <oesch@giub.unibe.ch> writes:

> Hello outthere,
>
> I know this topic was up before, but all I could find in the list was to
> go for CALL_EXTERNAL and use a FORTRAN etc. program. Here's my problem:
> Does anyone have an algorithm for finding the mean/standardeviation etc
> at each pixel position for a set of equal size 2-D images? Currently the
> only way I have to do this is to extract all the values for a given
> pixel position into a 1-D array and find the mean/standardeviation etc
> on that. Doing it pixel by pixel like this is inefficient in IDL so I am
> looking for an *array* based algorithm that would find all
> the mean/standardeviation etc in parallel.
> Any progs so far in IDL for this problem?..or a decent fortran or C program?

Sure, if you stack your image into a 3D image cube, then you would
have something like IMAGE = FLTARR(NX, NY, NIMAGES)

Then the mean image is:

```
  mean = total(image,3)/nimages
```

The standard deviation is:

```
  meancube = rebin(reform(mean,nx,ny,1),nx,ny,nimages)
  std = sqrt(total((image - meancube)^2,3)/(nimages-1))
```

Now, what you meant by "etc" can get a little hairier. If you want to
do median you are probably in trouble, but min and max are easy too:

```
  minimage = image(*,*,0)
  maximage = minimage
  for i = 1, nimages-1 do begin
     minimage = minimage < image(*,*,i)
     maximage = maximage > image(*,*,i)
  endfor
```

It's a loop, but unless you have a bazillion images, it will be fast.

Craig

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