Subject: Re: Can i avoid the loop,help me speed up,thanks
Posted by Rongchang Chen on Mon, 11 Aug 2008 14:56:10 GMT
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On Aug 5, 1:48 pm, Jeremy Bailin <astroco...@gmail.com> wrote:
> On Aug 4, 9:35 pm, Chris <beaum...@ifa.hawaii.edu> wrote:
>
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>
>> On Aug 4, 11:31 am, Vince Hradil <hrad...@yahoo.com> wrote:
>
>>> On Aug 4, 3:44 pm, "ben.bighair" <ben.bigh...@gmail.com> wrote:
>
>>>> On Aug 4, 9:29 am, Rongchang Chen <chenrc1...@gmail.com> wrote:
>
>>>> > I wrote a procedure to create sinograms from projections in
>>>> > tomography,the main part of procedure please see below.
>>>> > For large size and number projections,it's very very slow.
>>>> > Can i avoid the loop(one is OK) to speed up,or another way to create
>>>> > sinograms?
>>>> > Thank you very much!!
>
>>>> > ************
>>>> > n_sinogra:number of sinogram
>>>> > n_projection:number of projection
>>>> > files_projection:a string vector contain Directory and name of
>>>> > projection
>>>> > files_sino:a string vector contain Directory and name of sinogram
>
>>>> > for jj = 0,n_sinogram-1 do begin
>>>> > print,'now creating',jj+1,'th sinogram'
>>>> > sino = fltarr(sizepro[0],n_projection)
>
>>>> > for ii=0, n_projection-1 do begin
>>>> > image = float(read_image(files_projection[ii]))
>>>> > some processing of image
>>>> > sino(*,ii) = image(*,jj)
>>>> > endfor
>
>>>> > write_tiff,files_sino(jj),sino,/short,/float
>>>> > endfor
>>>> > *****************
>
>>>> Hi,
>
>>>> I don't think it is possible for anyone to penetrate where you are
>>>> having trouble with the given information. I think you might try
>>>> using the builtin PROFILER routine for a start. It should reveal to

>>>> you where you are spending most of your time.
>
>>>> Unrelated to the speed issue, you seem to be specifying TIFF output
>>>> simultaneously as a SHORT integer and a FLOAT. What type of image do
>>>> you want to be saving?
>
>>>> Cheers,
>>>> Ben
>
>>> I agree with Ben - the question is: what is in the "some processing of
>>> image" step? If this can be "vectorized", then you might be able to
>>> avoid some looping.
>
>> I would also add that you are taking a huge penalty by opening every
>> file in each outer loop iteration. IO is very, very slow. If you are
>> looking for a speedup, see if you can reverse the order of the loops
>> and read each file only once. The next step is to see if you can
>> eliminate your (currently) outer loop through vectorization, but this
>> requires a more detailed description of what kind of image processing
>> you are doing.
>
>> Chris
>
> I think Chris has hit the nail on the head... without knowing the
> processing, I don't know exactly what the final answer will look like,
> but I expect it to be something like:
>
> sino = fltarr(sizepro[0],n_projection)
> for ii=0l,n_projections-1 do begin
> image = float(read_image(files_projection[ii]))
> some_processing_that_updates_sino
> endfor
> for jj=0l,n_sinogram-1 do write_tiff,files_sino(jj),sino,/short,/float
>
> Hopefully "some_processing_that_updates_sino" can be vectorized, but
> even if it has to be a loop you should save lots of time.
>
> -Jeremy.

Thank you for discussion!
I'm sorry didn't clarify the ‘some processing of image’,I update
please check at the end.
For the output,because i processing the 16bit tiff image,so i choose
tiff as output.
I use PROFILER to check and show the I/O take most of time,use Chris
suggestion,I read all the projections(in 3D array) in advance and it
speed up a lot,but use 3D array I can just read 100 projections,if
more it complain’ % Array has too many elements.’ ??? how to avoid

this.
I'm thinking dose IDL has some type of file that I can write one row each time without read the file first??
Thank you very much.

The PROFILER, /REPORT processing 100 projections
IDL> PROFILER, /REPORT
Module Type Count Only(s) Avg.(s) Time(s) Avg.(s)
ARG_PRESENT (S) 295614 0.832386 0.000003 0.832386 0.000003
DIALOG_PICKFILE (S) 2 2.387062 1.193531 2.387062 1.193531
FILE_SEARCH (S) 3 0.010046 0.003349 0.010046 0.003349
FINDGEN (S) 1 0.000010 0.000010 0.000010 0.000010
FLOAT (S) 32827 95.750752 0.002917 95.750752 0.002917
FLTARR (S) 327 0.612496 0.001873 0.612496 0.001873
KEYWORD_SET (S) 65652 0.208982 0.000003 0.208982 0.000003
MEAN (U) 34714 0.481618 0.000014 3.597480 0.000104
MOMENT (U) 34714 1.497712 0.000043 3.006887 0.000087
N_ELEMENTS (S) 197036 0.617928 0.000003 0.617928 0.000003
ON_ERROR (S) 131344 0.452073 0.000003 0.452073 0.000003
PRINT (S) 326 0.163605 0.000502 0.163605 0.000502
PROFILER (S) 1 0.000029 0.000029 0.000029 0.000029
QUERY_IMAGE (U) 34794 5.392034 0.000155 25.506740 0.000733
QUERY_TIFF (S) 32846 18.352950 0.000559 18.352950 0.000559
READ_IMAGE (U) 34794 12.169956 0.000350 152.321188 0.004378
READ_TIFF (S) 32846 114.154426 0.003475 114.154426 0.003475
SIZE (S) 32827 0.210118 0.000006 0.210118 0.000006
STRARR (S) 1 0.000006 0.000006 0.000006 0.000006
STRING (S) 325 0.000922 0.000003 0.000922

```
0.000003
STRLEN          (S)   32846    0.096697  0.000003    0.096697
0.000003
STRMID          (S)   32846    0.157079  0.000005    0.157079
0.000005
STRPOS          (S)   65692    0.334411  0.000005    0.334411
0.000005
STRTRIM         (S)     325    0.000949  0.000003    0.000949
0.000003
STRUPCASE       (S)   32846    0.147017  0.000004    0.147017
0.000004
TOTAL           (S)   32826    0.813293  0.000025    0.813293
0.000025
WIDGET_PROCESS_EVENTS
              (S)       2    0.000057  0.000028    0.000057
0.000028
WRITE_TIFF      (S)     325    6.225517  0.019155    6.225517
0.019155


************
n_sinogra:number of sinogram
n_projection:number of projection
files_projection:a string vector contain Directory and name of
projection
files_sino:a string vector contain Directory and name of sinogram
flat:image same size as projection(image =
float(read_image(files_projection[ii])))
for jj = 0,n_sinogram-1 do begin
    print,'now creating',jj+1,'th sinogram'
    sino = fltarr(sizepro[0],n_projection)

    for ii=0, n_projection-1 do begin
        image = float(read_image(files_projection[ii]))
        ;correct the faltfield artefact of projection
        image = image/(mean(image(0:20,*))/mean(flat(0:20,*))*flat)
        sino(*,ii) = image(*,jj)
    endfor

    write_tiff,files_sino(jj),sino,/short,/float
endfor
*****************
```