Subject: Fast way to collapse data cube with median
Posted by stefan.meingast on Tue, 09 Jul 2013 16:08:31 GMT
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Hey

I am doing a lot of image processing and very often I have a data cube like with the x/y axes corresponding to image coordinates and the z component corresponding to the individual images.

I simply want to calculate the median at each pixel stack and so far I always loop through all pixels and determine the median for each stack. This, of course, can be quite slow for large images since it involves two loops and I was wondering if someone here might have a fancy idea of how to collapse such a cube faster.

thank a lot
:)

Subject: Re: Fast way to collapse data cube with median
Posted by David Fanning on Tue, 09 Jul 2013 16:22:15 GMT
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Stefan writes:

> I am doing a lot of image processing and very often I have a data cube
like with the x/y axes corresponding to image coordinates and the z
component corresponding to the individual images.
>
> I simply want to calculate the median at each pixel stack and so far I always loop through all pixels and determine the median for each stack. This, of course, can be quite slow for large images since it involves two loops and I was wondering if someone here might have a fancy idea of how to collapse such a cube faster.

medianValuesOfArray = Median(cube, DIMENSION=3)

Cheers,

David

--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.idlcoyote.com/
Sepore ma de ni thue. ("Perhaps thou speakest truth.")

Subject: Re: Fast way to collapse data cube with median
Posted by Michael Galloy on Tue, 09 Jul 2013 16:28:13 GMT
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On 7/9/13 10:08 AM, Stefan wrote:
> Hey
>
> I am doing a lot of image processing and very often I have a data
> cube like with the x/y axes corresponding to image coordinates and
> the z component corresponding to the individual images.
>
> I simply want to calculate the median at each pixel stack and so far
> I always loop through all pixels and determine the median for each
> stack. This, of course, can be quite slow for large images since it
> involves two loops and I was wondering if someone here might have a
> fancy idea of how to collapse such a cube faster.
>
> thank a lot :)
>

Yes, use the DIMENSION keyword to median (dimensions start at 1):

```
IDL> arr = findgen(2, 3, 4)
IDL> m = median(arr, dimension=2)
IDL> help, m
M               FLOAT     = Array[2, 4]
```

Mike
--
Michael Galloy
www.michaelgalloy.com
Modern IDL: A Guide to IDL Programming (http://modernidl.idldev.com)
Research Mathematician
Tech-X Corporation

Subject: Re: Fast way to collapse data cube with median
Posted by stefan.meingast on Tue, 09 Jul 2013 17:42:25 GMT
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Great, I forgot about this keyword. :)

Unfortunately its only 3% faster compared to my method...hmm

cheers and thanks a lot!!!

Subject: Re: Fast way to collapse data cube with median
Posted by David Fanning on Tue, 09 Jul 2013 17:44:57 GMT
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Stefan writes:

> Unfortunately its only 3% faster compared to my method...hmm

Maybe you will have to reorganize your data array. TRANSPOSE can do this for you.

Cheers,

David

--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.idlcoyote.com/
Sepore ma de ni thue. ("Perhaps thou speakest truth.")

Subject: Re: Fast way to collapse data cube with median
Posted by stefan.meingast on Tue, 09 Jul 2013 19:14:23 GMT
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Thanks for the tip. You are right, this is faster. One can rearrange the cube and use the dimension=2 keyword (instead of 3). However, when I use TRANSPOSE to rearrange the array, the total time it takes to transpose and collapse the cube is longer than what I had before, so I created the transposed array at the point where I create the cube and skip the call of TRANSPOSE. Now its twice as fast. :)

thanks a lot!