Subject: Re: Array indices and lookup tables
Posted by David Fanning on Wed, 09 Jun 2004 13:42:20 GMT
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Haje Korth writes:

> I am working on a coordinate transformation for a map and I have a simple
> problem. My mind is alreay blocked early in the morning and I could use some
> input: I have an rgb image of dimensions [3,1440, 720]. I need to rearranged
> the pixel in the image according to a lookup table of dimension
> [2,1440,360], which contains the column and row of the new pixel assigned to
> a location. Is there a magic way to do this without looping through each
> pixel in IDL?

Oh, dear. Come back after I've had a couple of cups
of coffee, would you. :-(

Cheers,

David

P.S. With the (what!?) thousand different map projections
now in IDL, are you *sure* you need a look-up table? :-)

--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.dfanning.com/

Subject: Re: Array indices and lookup tables
Posted by Haje Korth on Wed, 09 Jun 2004 14:06:17 GMT
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David,
damn, I was sure you had your coffee already by now. But then again, I am
two hours ahead of you. :-) To answer your question: Yes, I am *sure* I need
the lookup table. What I am doing is to transform a geographic map to
geomagnetic coordinates. Now, this would not be so bad if it only had to be
done once. But the map is composed out of two maps forming a day and a
nightside. The composition thus depends upon time of day as well as on
season. It is impossible to create images for all possible times and thus
they need to be created on the fly. As you can imagine I try to avoid having
to drink a whole pot of coffee until the conversion is completed. :-)

Since the conversion between geomagnetic and geographic coordinates is
nearly fixed a lookup table will do the job nicely. Is there a one line
command that will do the job using the right number of [and] in the right

order? Well, anything will do that prevents me from loopong through 1 million+ elements.

Cheers,
Haje

"David Fanning" <davidf@dfanning.com> wrote in message news:MPG.1b30c1a7910a91fa989789@news.frii.com...
> Haje Korth writes:
>
>> I am working on a coordinate transformation for a map and I have a simple
>> problem. My mind is alreay blocked early in the morning and I could use some
>> input: I have an rgb image of dimensions [3,1440, 720]. I need to rearranged
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>> a location. Is there a magic way to do this without looping through each
>> pixel in IDL?
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> Oh, dear. Come back after I've had a couple of cups
> of coffee, would you. :-(
>
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> David
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> P.S. With the (what!?) thousand different map projections
> now in IDL, are you *sure* you need a look-up table? :-)
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> --
> David Fanning, Ph.D.
> Fanning Software Consulting, Inc.
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Subject: Re: Array indices and lookup tables
Posted by David Fanning on Wed, 09 Jun 2004 14:26:08 GMT
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Haje Korth writes:

> Since the conversion between geomagnetic and geographic coordinates is
> nearly fixed a lookup table will do the job nicely. Is there a one line
> command that will do the job using the right number of [and] in the right

> order?

I don't know. I have a headache already. (West Nile virus? Those
pesky mosquitoes were out and about last night!) I'm going to
leave this question in the capable hands of the JD Smith
acolytes. :-)

Cheers,

David

--
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Subject: Re: Array indices and lookup tables
Posted by Haje Korth on Wed, 09 Jun 2004 14:49:59 GMT
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Don't remind me of those mosquitoes. We were sitting by the fire in the yard
last night, and got eaten alive! So maybe that's why I can't get this
straight. Well, hopefully JD had his coffee and is virus free, so I can get
some help.:-)))

Cheers,
Haje

"David Fanning" <davidf@dfanning.com> wrote in message
news:MPG.1b30cbed34f63b9598978a@news.frii.com...
> Haje Korth writes:
>
>> Since the conversion between geomagnetic and geographic coordinates is
>> nearly fixed a lookup table will do the job nicely. Is there a one line
>> command that will do the job using the right number of [and] in the
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>> order?
>
> I don't know. I have a headache already. (West Nile virus? Those
> pesky mosquitoes were out and about last night!) I'm going to
> leave this question in the capable hands of the JD Smith
> acolytes. :-)
>
> Cheers,
>
> David
>

> --
> David Fanning, Ph.D.
> Fanning Software Consulting, Inc.
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Subject: Re: Array indices and lookup tables
Posted by Chris Lee on Thu, 10 Jun 2004 08:39:05 GMT
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In article <ca72v6qlb1@aplcore.jhuapl.edu>, "Haje Korth"
<haje.korth@jhuapl.edu> wrote:

> Good morning all,
> I am working on a coordinate transformation for a map and I have a
> simple problem. My mind is alreay blocked early in the morning and I
> could use some input: I have an rgb image of dimensions [3,1440, 720]. I
> need to rearranged the pixel in the image according to a lookup table of
> dimension [2,1440,360], which contains the column and row of the new
> pixel assigned to a location. Is there a magic way to do this without
> looping through each pixel in IDL?
> Thanks for helping,
> Haje
>

The lookup table....Why is there only 360 points in the third dimension,
not 720?

I'm assuming the dimensions go as:
1st: [column, row]
2nd: new X location
3rd: new Y location

If the 2nd and 3rd dimensions are the location of the point in the new
image then you have a list of 1440*360
points linking the old coordinates to the new grid?

TRIANGULATE and TRIGRID should work then? using the XOUT and YOUT
keywords to set your output grid.

Chris.

Subject: Re: Array indices and lookup tables
Posted by Haje Korth on Thu, 10 Jun 2004 13:11:55 GMT

Christopher,
oops, you are right, the 360 should have been a 720. I have worked with triangulate and trigrid in the past and what I learned is that you do NOT use these in time-critical operations. This is even slower than looping through a lookup table.

Cheers,
Haje

"Christopher Lee" <cl@127.0.0.1> wrote in message
news:20040610.093904.771151432.32286@buckley.atm.ox.ac.uk...
> In article <ca72v6qlb1@aplcore.jhuapl.edu>, "Haje Korth"
> <haje.korth@jhuapl.edu> wrote:
>
>
>> Good morning all,
>> I am working on a coordinate transformation for a map and I have a
>> simple problem. My mind is alreay blocked early in the morning and I
>> could use some input: I have an rgb image of dimensions [3,1440, 720]. I
>> need to rearranged the pixel in the image according to a lookup table of
>> dimension [2,1440,360], which contains the column and row of the new
>> pixel assigned to a location. Is there a magic way to do this without
>> looping through each pixel in IDL?
>> Thanks for helping,
>> Haje
>>
>
> The lookup table....Why is there only 360 points in the third dimension,
> not 720?
>
> I'm assuming the dimensions go as:
> 1st: [column, row]
> 2nd: new X location
> 3rd: new Y location
>
> If the 2nd and 3rd dimensions are the location of the point in the new
> image then you have a list of 1440*360
> points linking the old coordinates to the new grid?
>
> TRIANGULATE and TRIGRID should work then? using the XOUT and YOUT
> keywords to set your output grid.
>
>
> Chris.

Subject: Re: Array indices and lookup tables
Posted by David Fanning on Thu, 10 Jun 2004 13:57:21 GMT
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Haje Korth writes:

> oops, you are right, the 360 should have been a 720. I have worked with
> triangulate and trigrid in the past and what I learned is that you do NOT
> use these in time-critical operations. This is even slower than looping
> through a lookup table.

Well, if that's the case, then here is an example that works,
more or less:

```
IDL> filename = Filepath(Subdir=['examples', 'data'], 'rose.jpg')
IDL> Read_JPEG, filename, rose
IDL> help, rose
ROSE            BYTE      = Array[3, 227, 149]
IDL> a=indgen(227,149)         ; Look-up table
IDL> a = shift(a, 100)         ; Shift it so it looks different
IDL> r = bytarr(3, 227, 149)   ; The new image, r.
IDL> r[0,*,*] = (rose[0,*,*])[a]
IDL> r[1,*,*] = (rose[1,*,*])[a]
IDL> r[2,*,*] = (rose[2,*,*])[a]
IDL> window, xsize=2*227, ysize=149
IDL> tv, rose, 0, true=1
IDL> tv, r, 1, true=1
```

Cheers,

David

--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
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Subject: Re: Array indices and lookup tables
Posted by David Fanning on Thu, 10 Jun 2004 13:59:52 GMT
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David Fanning writes:

> Well, if that's the case, then here is an example that works,
> more or less:

Whoops! Not exactly the right example. But in the right

direction, I think. :-)

Maybe I can work on it more later. Have to go...

David

--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.dfanning.com/

Subject: Re: Array indices and lookup tables
Posted by Chris Lee on Thu, 10 Jun 2004 17:15:15 GMT
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In article <ca9mms$f24$1@aplcore.jhuapl.edu>, "Haje Korth"
<haje.korth@jhuapl.edu> wrote:

> Christopher,
> oops, you are right, the 360 should have been a 720. I have worked with
> triangulate and trigrid in the past and what I learned is that you do
> NOT use these in time-critical operations. This is even slower than
> looping through a lookup table.
> Cheers,
> Haje
> "Christopher Lee" <cl@127.0.0.1> wrote in message
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>> In article <ca72v6qlb1@aplcore.jhuapl.edu>, "Haje Korth"
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>>
>>> Good morning all,
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>>> simple problem. My mind is alreay blocked early in the morning and I
>>> could use some input: I have an rgb image of dimensions [3,1440,
>>> 720]. I need to rearranged the pixel in the image according to a
>>> lookup table of dimension [2,1440,360], which contains the column and
>>> row of the new pixel assigned to a location. Is there a magic way to
>>> do this without looping through each pixel in IDL?
>>> Thanks for helping,
>>> Haje
>>>

Ok, so you have two vectors of numbers, each one 1440*720 numbers long..

cx=fltarr(1440,720) ; Just setting the scene :)
cy=fltarr(1440,720)

;these map the value at source[cx[i,j],cy[i,j]] to
dest[i,j], which I think is what your doing.

```
source=fltarr(3,1440,720)
dest=fltarr(3, 1440,720)

dest[0,*,*]=source[replicate(0,1440,720),cx,cy]
etc.

;which, I think does what you want, it certainly manages the one-to-one
mapping find(i.e. the same coordinates). The replicate line is so that
IDL doesn't take a rectangle of the data, it's probably not absolutely
necessary here...but..

if you want to do all 3 channels in one go, and who wouldn't :)

nx=1440
ny=720

dest=source[ rebin(reform([0,1,2], [3,1,1]),[nx, ny]),
    rebin(reform(cx,[1,nx,ny]), [3, nx, ny]),
                rebin(reform(cy,[1,nx.ny]), [3,nx,ny])
               ]
```

I think that works, again, it mapped one-to-one ok.

Chris.
