
Subject: fun with nonlinearity and COLORBAR

Posted by [Jeremy Bailin](#) on Thu, 21 Oct 2010 19:20:56 GMT

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I'm looking for advice on a plot I'm making that uses David's COLORBAR routine. The problem is that the mapping between color index in the image and data value is quite non-linear - and not a simple transformation, either (it's generated via histogram equalization).

There are a few ways I can imagine having it look. So first, from an aesthetics (and ease-of-understanding) standpoint, which would be best?

1. The colorbar has one line for each color index, and is annotated using 6 evenly-spaced divisions, but the numbers marking those divisions are not evenly distributed.
2. The colorbar has one line for each color index, the annotations are evenly spaced in *value*, but are spaced unevenly along the color bar.
3. The colorbar is annotated using 6 evenly-spaced divisions that have evenly-spaced numbers, and the colors within the color bar vary (i.e. the mapping between row up the color bar and color index is no longer linear).

The second question is implementation. I can achieve #1 very easily using COLORBAR. I think that in order to do #2, I would need to essentially roll my own version of COLORBAR that changes the annotation locations - are there any shortcuts that would let me use the existing routine? To do #3, my best idea is to regenerate a new (non-linearly altered) color table, and then use the existing COLORBAR routine. Any caveats with that, or any easier ways to do it?

Alternatively, what other ideas do people have for conveying this kind of information?

-Jeremy.

Subject: Re: fun with nonlinearity and COLORBAR

Posted by [pgrigis](#) on Fri, 22 Oct 2010 14:37:32 GMT

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On Oct 21, 10:34 pm, Jeremy Bailin <astroco...@gmail.com> wrote:

> On Oct 21, 3:35 pm, David Fanning <n...@dfanning.com> wrote:

>

>

>

>> Jeremy Bailin writes:

>>> I'm looking for advice on a plot I'm making that uses David's COLORBAR

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>>> routine. The problem is that the mapping between color index in the
>>> image and data value is quite non-linear - and not a simple
>>> transformation, either (it's generated via histogram equalization).
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>>> aesthetics (and ease-of-understanding) standpoint, which would be
>>> best?
>>> 1. The colorbar has one line for each color index, and is annotated
>>> using 6 evenly-spaced divisions, but the numbers marking those
>>> divisions are not evenly distributed.
>>> 2. The colorbar has one line for each color index, the annotations
>>> are evenly spaced in *value*, but are spaced unevenly along the color
>>> bar.
>>> 3. The colorbar is annotated using 6 evenly-spaced divisions that
>>> have evenly-spaced numbers, and the colors within the color bar vary
>>> (i.e. the mapping between row up the color bar and color index is no
>>> longer linear).
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>>> The second question is implementation. I can achieve #1 very easily
>>> using COLORBAR. I think that in order to do #2, I would need to
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>>> annotation locations - are there any shortcuts that would let me use
>>> the existing routine? To do #3, my best idea is to regenerate a new
>>> (non-linearly altered) color table, and then use the existing COLORBAR
>>> routine. Any caveats with that, or any easier ways to do it?
>
>>> Alternatively, what other ideas do people have for conveying this kind
>>> of information?
>
>> If you are talking about six discrete colors, I would use
>> the discrete color bar, DCBAR.
>
>> I have implemented something like number 1, equally spaced
>> divisions, with non-linear values, using FSC_Colorbar (new
>> name!) in this article:
>
>> http://www.dfanning.com/map\_tips/precipmap.html
>
>> I had to use a tick formatting function to do it correctly.
>
>> Cheers,
>
>> David
>
>> --
>> David Fanning, Ph.D.
>> Fanning Software Consulting, Inc.
>> Coyote's Guide to IDL Programming:http://www.dfanning.com/

```

>> Sepore ma de ni thui. ("Perhaps thou speakest truth.")
>
> Ah yes, FSC_COLORBAR. ;-) I haven't switched to 8.0 yet, so I'm still
> safe from that issue for now...
>
> It's a continuous color bar (basically color table 4 with a slight
> modification). I've got a feeling that #3 is the aesthetically-correct
> thing to do. Not coincidentally, it's probably the one that requires
> the most work. Ah well...

Well, to get a quick idea of the possibility download
http://hea-www.cfa.harvard.edu/~pgrigis/idl_stuff/pg_plotimage.pro

and try this:

```
;set up colorbar
loadct,5
x=[[findgen(256)],[findgen(256)]]

;plot colorbar

;uniform ticks, uniform colors
pg_plotimage,x
;uniform ticks, stretched colors
pg_plotimage,alog(x+1)

;weird ticks
pg_plotimage,x,xtickv=[10,100,120,150,220],xticks=4,/xst

;logscaling
pg_plotimage,alog(x+1),/xlog,/xst
```

Have fun exploring - hopefully you'll be able to find a good
representation
for your purpose (and when you do you can use more proper tools than
my image plotter).

Ciao,
Paolo

>
> -Jeremy.
