Subject: Phase Unwrapping algorithm in IDL
Posted by Richard Tyc on Thu, 22 Jun 2000 07:00:00 GMT
View Forum Message <> Reply to Message

Would anyone have a 2D phase image unwrapping algorithm they would be willing to share ? (an algorithm which corrects for phase spillover on images which may only contain data between 0 and 2PI but in fact the data has a larger range which gets wrapped into the 0 -> 2PI range)

If not in IDL, one in C or Fortran would also help.

Thanks in Advance

Richard Tyc

Subject: Re: phase unwrapping
Posted by Craig Markwardt on Fri, 14 Sep 2001 18:37:45 GMT
View Forum Message <> Reply to Message

Alexander Rauscher <e9121161@stud4.tuwien.ac.at> writes:
>
> i need a phase unwrapping algorithm (MRI, buti think it doenst really
> matter what type of data it is. does anyone have experience with
> this? it turnded out to be quite a tough problem...
> alex

Hi Alexander--

Answers to these questions have been discussed by "R. G. S.", Robert Weiss, and Nando Ivarone in the past year and a half. The first two posters provided actual code. I have provided some message id's below.

For some reason Google Groups has discarded the actual code from these posts, but you can still find it at my newsgroup archive, using this search query:

http://cow.physics.wisc.edu/cgi-bin/msearch?keyall=phase+unw rapping

Craig

Message-Id: fL4F4.16761$1g1.495467@den-news1.rmi.net
Message-Id: 3953658A.EB723200@mpia-hd.mpg.de
Message-Id: 3A80F590.95C94E2A@acsys.it

--
 ---------------------------------------------------------- --------------
Craig B. Markwardt, Ph.D.  EMAIL:  craigmnet@cow.physics.wisc.edu
Astrophysics, IDL, Finance, Derivatives | Remove "net" for better response
 ---------------------------------------------------------- --------------

Subject: Re: phase unwrapping
Posted by Clay Kirkendall on Tue, 18 Sep 2001 18:36:35 GMT
View Forum Message <> Reply to Message

Alexander Rauscher wrote:

> hi everybody
>
> i need a phase unwrapping algorithm (MRI, buti think it doenst really
> matter what type of data it is. does anyone have experience with
> this? it turnded out to be quite a tough problem...
> alex

Alex,
 Here is a routine that I have been using for several years without
problems.
It defaults to 2pi phase resets but by using thresh and step it will
correct
for any step size. Depending on your data you may need to manually set
thresh and
step.

Good luck,
Clay

```
Function  unwrap, x, thresh, step
;
;  This routine removes resets from data vectors that have a
;modulus reset  of size step.  The data record is scanned for
;|resets| > |thresh| and adjusts the x by multiples of step
;
;
;
;MODIFICATIONS: 2/99 - added defaults for thresh and step
; 000831 - let x be an array
;

   if n_params() eq 1 then $
      Begin
        thresh = !pi * 1.5
```

```
    step = 2 * !pi
  EndIf

  sx=size(x)
  if sx(0) EQ 0  then $
      BEGIN
        print, 'X must be a vector for this routine'
        return, NaN
      ENDIF

  if sx[0] EQ 2 then $ ;Input is a two dimensional array
    Begin
       lx = length(x)

      ;get the derivative
       dt=x(*, 0:lx-2) - x(*, 1:lx-1)

       ;search for steps greater then thresh
       ddt=float(dt ge thresh) - (dt le (-thresh))

       iddt=[ [replicate(0.0, sx[1])], [total(ddt, 2,
/CUMULATIVE)] ] * step

       return, x + iddt

    EndIf Else $
      Begin
        lx = max(sx(1:sx(0)), dim)

        ;get the derivative
        dt=x(0:lx-2) - x(1:lx-1)

        ;search for steps greater then thresh
        ddt=(dt ge thresh)*1. - (dt le (-thresh))

        iddt=[0, total(ddt, /CUMULATIVE)] * step

        return,  x + iddt

    EndElse

END
```