Subject: azimuthal median
Posted by Bringfried Stecklum on Mon, 14 Jan 2008 13:22:10 GMT
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Hi folks,

I am looking for a faster way to compute the azimuthal median in
dependence on radius than the brute-force method, i.e. getting the index
of pixels within a certain annulus, and using median(image[idx]). Is
this another case for the histogram wizards out there?

regards,

Bringfried

Subject: Re: azimuthal median
Posted by Wox on Tue, 15 Jan 2008 09:48:12 GMT
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On Mon, 14 Jan 2008 14:22:10 +0100, Bringfried Stecklum
<stecklum@tls-tautenburg.de> wrote:

> Hi folks,
>
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> dependence on radius than the brute-force method, i.e. getting the index
> of pixels within a certain annulus, and using median(image[idx]). Is
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>
> regards,
>
> Bringfried

I'm not familiar azimuthal median but what about image warping:

```
; Make azimuthal range
a0=0.
a1=2*!pi
ai=0.1
na=ceil((a1-a0)/ai)+1
ai=(a1-a0)/(na-1)
a=a0+ai*indgen(na)

; Make radial range
r0=10.
r1=20.
```

```
ri=0.1
nr=ceil((r1-r0)/ri)+1
ri=(r1-r0)/(nr-1)
r=r0+ri*indgen(nr)

; Radius and azimuth for warped image
r=rebin(r,nr,na,/sample)
a=rebin(transpose(a),nr,na,/sample)

; X and Y for warped image (xc,yc is center)
xmap=xc+r*cos(a)
ymap=yc+r*sin(a)

; Warped image
oimage=Interpolate(image,xmap,ymap,/cubic)

; Median
m=median(oimage,dim=1)
```

Subject: Re: azimuthal median
Posted by Brian Larsen on Tue, 15 Jan 2008 15:57:48 GMT
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Bringfried,

I do this all the time and histogram is definitely the correct way. I find that I have to reread the horrors of histogram often (although less often lately, maybe I am learning). http://www.dfanning.com/tips/histogram_tutorial.html

The basic idea is that you have to setup histogram to have bins where you want them then pull the indices out with reverse_indices.

I have a few to many things this second to make an example but in sudo code it is like this (for me)

```
;; get the data
;; run histogram on the data
hi = histogram(data, binzise=0.4, min=1, reverse_indices=ri)
for i=0l, n_elements(hi)-1 do begin
;; do the reverse indices magic to get the right indices
;; do whatever computation and store it somewhere
endfor
```

Cheers,

Brian

---------- ----------
Brian Larsen
Boston University
Center for Space Physics

Subject: Re: azimuthal median
Posted by Wox on Wed, 16 Jan 2008 08:38:28 GMT
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On Tue, 15 Jan 2008 10:48:12 +0100, Wox <nomail@hotmail.com> wrote:

> On Mon, 14 Jan 2008 14:22:10 +0100, Bringfried Stecklum
> <stecklum@tls-tautenburg.de> wrote:
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> r0=10.
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> ri=0.1
> nr=ceil((r1-r0)/ri)+1
> ri=(r1-r0)/(nr-1)
> r=r0+ri*indgen(nr)
>
> ; Radius and azimuth for warped image
> r=rebin(r,nr,na,/sample)
> a=rebin(transpose(a),nr,na,/sample)
>
> ; X and Y for warped image (xc,yc is center)
> xmap=xc+r*cos(a)
> ymap=yc+r*sin(a)
>
> ; Warped image
> oimage=Interpolate(image,xmap,ymap,/cubic)
>
> ; Median
> m=median(oimage,dim=1)

Should be m=median(oimage,dim=2) otherwise you get the median as a function of azimuth.

Subject: Re: azimuthal median
Posted by Bringfried Stecklum on Wed, 16 Jan 2008 13:46:41 GMT
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Dear Brian and Wox,

thanks to both of you. What I am doing right now is to set up an array which holds the radius values, and use the reverse indices returned by histogram (applied to the radius array) to access the data. This speeds up things quite a bit.

with kind regards,

Bringfried

Subject: Re: azimuthal median - final remark
Posted by Bringfried Stecklum on Thu, 17 Jan 2008 10:53:26 GMT
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Another improvement is to compute the radial indices only once, and account for the different object positions in the image by accessing the proper index range, i.e. object_idx=idx[r]+nx_pixels*ypos+xpos.

Bringfried Stecklum wrote:
> Dear Brian and Wox,
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> which holds the radius values, and use the reverse indices returned by
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