
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,

>

> 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

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:
>
>> Hi folks,
>>
>> I am looking for a faster way to compute the azimuthal median in
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> 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)
```

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
> histogram (applied to the radius array) to access the data. This speeds
> up things quite a bit.
>
> with kind regards,
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> Bringfried
