Subject: Re: lens distortion
Posted by Timm Weitkamp on Thu, 18 Sep 2003 12:15:42 GMT
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On 16.09.03 at 22:10 -0000, Ale wrote:

> I need to develop an IDL routine to correct lens distortion
> (barrel/pincushion) for our CT camera. Where could I find suggestions or
> examples on this topics ?

Google for "idl" and "pin-cushion". Plenty of results, and even some
potentially useful ones.

Good luck
Timm

BTW: Sometimes you find a web entry that makes reference to a user-written
IDL routine, but you can't seem to find the code of the routine anywhere.
In those cases, googling for the starting line of the code sometimes
helps. Say you're looking for a procedure called "foo", then google for
"pro foo" to find the code.

--
Timm Weitkamp <http://people.web.psi.ch/weitkamp>

Subject: Re: lens distortion
Posted by Ale on Fri, 19 Sep 2003 14:41:08 GMT
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Before my message on thi newsgroup I seached a l ot with Gogle but I haven't
find anything interesting .
Did you find something ?

Thank you

"Timm Weitkamp" <timm.weitkamp@nowhere.edu> ha scritto nel messaggio
news:Pine.LNX.4.44.0309181404520.12470-100000@localhost.loca ldomain...
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> "pro foo" to find the code.
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> --
> Timm Weitkamp <http://people.web.psi.ch/weitkamp>
>

Subject: Re: lens distortion
Posted by JD Smith on Fri, 19 Sep 2003 18:17:53 GMT
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On Tue, 16 Sep 2003 15:10:04 -0700, Ale wrote:

> I need to develop an IDL routine to correct lens distortion
> (barrel/pincushion) for our CT camera. Where could I find suggestions or
> examples on this topics ?
>

Not too hard to develop on your own. Have a look at:

http://www.path.unimelb.edu.au/~dersch/barrel/barrel.html

Near the bottom, he describes the quartic radial polynomial which
achieves barrel/pincushion correction. You can use just one of the
terms to get decent correction, e.g.:

```
 r_src=(b*r_dest^2+(1-b))*r_dest
```

The idea is to transform the radius to each pixel using this equation,
remap to cartesian coordinates, and use INTERPOLATE to get the
results. Here's what I came up with:

```
function pincushion_correct,im,b
  d=size(im,/dimensions)

  ;; Create, scale and correct a radius to each pixel
  scale=.5*min(d)
  r_dest=shift(dist(d[0],d[1]),d/2)/scale
  r_src=(b*r_dest^2+(1.-b))*r_dest*scale
```

```
  ;; Convert back to cartesian coordinates
  l=lindgen(d) & dy=d[1]/2-l/d[0] & dx=l mod d[0]-d[0]/2
  angle=atan(double(dy),double(dx))
   r_theta=[reform(angle,1,product(d)),reform(r_src,1,product(d ))]
  new_xy=cv_coord(FROM_POLAR=r_theta,/TO_RECT)
  x_src=reform(new_xy[0,*],d)+d[0]/2 & y_src=d[1]/2-reform(new_xy[1,*],d)
  return,interpolate(im,x_src,y_src,/CUBIC)
end
```

And then try:

```
read_jpeg,filepath('people.jpg', SUBDIR=['examples','data']),im,/GRAYSCALE
tv,[im,pincushion_correct(im,-.15)]
```

Note that typical corrections for rectilinear lenses are around -.02
to .02 (this was exaggerated for demonstration purposes), and that
negative b's correct barrel, positive b's correct pincushion. This
same technique could be used for any distortions, including "rubber
sheet". Be aware, however, that IDL's native interpolator isn't the
best; see http://www.path.unimelb.edu.au/~dersch/interpolator/interpol ator.html
to find out how various interpolation algorithms stack up when used
with imaging data.

Good luck,

JD

Subject: Re: lens distortion
Posted by Ale on Mon, 22 Sep 2003 11:53:14 GMT
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I tried your routine but I received this error :

```
IDL> .COMPILE "C:\WINDOWS\Desktop\lente.pro"
% Compiled module: PINCUSHION_CORRECT.
IDL> read_jpeg,filepath('people.jpg',
SUBDIR=['examples','data']),im,/GRAYSCALE
% Compiled module: FILEPATH.
% Loaded DLM: JPEG.
IDL> tv,[im,pincushion_correct(im,-.15)]
% Compiled module: DIST.
% SHIFT: Expression must be a scalar in this context: <LONG      Array[2]>.
% Execution halted at:  PINCUSHION_CORRECT    6 C:\WINDOWS\Desktop\lente.pro
%                       $MAIN$
```

Perhaps I did something wrong.
Thank you for your help

Ale

"JD Smith" <jdsmith@as.arizona.edu> ha scritto nel messaggio
news:pan.2003.09.19.18.17.53.555731.30604@as.arizona.edu...
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>
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> l=lindgen(d) & dy=d[1]/2-l/d[0] & dx=l mod d[0]-d[0]/2
> angle=atan(double(dy),double(dx))
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