Subject: image correlation
Posted by Fabinho on Mon, 20 Apr 2009 12:21:53 GMT
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Hi everyone!
I have a problem about using PV-Wave and I think someone might be able to help me.

I need to compare two images. I would like to use a photo as a reference, in this photo i will define a point that im interested in. With this image of reference and this point, I would like to compare this image with a second image, very simillar, and I need that the program finds this point im interested in this second image.

To give an example really simple, its kinda like I have a picture oh a dark room with one led, so i will define the position of this led as a point of reference, then in the second image i will have the same room with a led, but the led is in other position, that i want that the program compares the two images and give me the position of the led in this second image.

Thanks a lot if everyone can help me

Fabio V. Coelho

Subject: Re: image correlation
Posted by Brian Larsen on Mon, 20 Apr 2009 22:20:22 GMT
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I would start with a read through this post and see if that provides a starting point.

http://groups.google.com/group/comp.lang.idl-pvwave/browse_f
rm/thread/ec571edc54c357e1/9c81f8b21954e471?tvc=1&q=lars en#9c81f8b21954e471

Cheers,

Brian

Brian Larsen
Boston University
Center for Space Physics
http://people.bu.edu/balarsen/Home/IDL

Subject: Re: image correlation
Posted by Fabinho on Tue, 21 Apr 2009 06:58:43 GMT
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thanks a lot! I will read it and get started!
thks

On 21 avr, 00:20, Brian Larsen <balar...@gmail.com> wrote:
> I would start with a read through this post and see if that provides a
> starting point.
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> http://groups.google.com/group/comp.lang.idl-pvwave/browse_f rm/thread...
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> Brian
>
> ---------- ----------
> Brian Larsen
> Boston University
> Center for Space Physicshttp://people.bu.edu/balarsen/Home/IDL

Subject: Re: image correlation
Posted by Fabinho on Tue, 21 Apr 2009 09:43:23 GMT
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Good morning Brian or everyone,
I read the topics in
http://groups.google.com/group/comp.lang.idl-pvwave/browse_f
rm/thread/ec571edc54c357e1/9c81f8b21954e471?tvc=1&q=lars en#9c81f8b21954e471,
as you recommended.

I dont know why but im still having a lot of trouble with pvwave.
Honnestly, im not an expert in programming. First I tryed to open the
apple routine at http://people.bu.edu/balarsen/Home/IDL/Entries/2009/4/6_Imag
e_registration_for_c_correlate.html.
It didnt work at all! What should I do with the two routines, do I
have to put in the same file? the routine "wheretomulti" before, and
than the image-registration. Right? I tryed to do it, I also tryed to
have 2 differents files in the same folder, but when i tryed to
compile there was a lot of synthax problems. Maybe im not using the
software correctly? It seems that the software finds the file he is
supposed to compile, but he doesnt understand it at all.
After i tryed to run the code that wox made, but also didnt work, i
changed the name of the rose picture to one picture that i had, didnt
work.
I would be really thankful if someone are able to help me. Im working

for a multinational company in france, my boss gave this part to me as
a challenge!

thanks
ps: wox's code
CODE:

```
;-----------------------
pro test
path = Filepath(Subdir=['examples', 'data'], 'rose.jpg')
read_jpeg, path, img, /true
img = 0.3*Reform(img[0,*,*]) + 0.59*Reform(img[1,*,*]) +
0.11*Reform(img[0,*,*])

kernelSize = [10,10]
kernel = REPLICATE((1./(kernelSize[0]*kernelSize[1])), $
   kernelSize[0], kernelSize[1])
img2= CONVOL(img, kernel, /CENTER, /EDGE_TRUNCATE)

print,image_equal(img,img2,/outid)
end;pro test
;-----------------------
function
 image_equal,img1,img2,npix=npix,shifttol=shifttol,Rtol=Rtol, outid=outid
; Image offsets or scales don't matter
; npix: subimage pixels for cross-correlation
; shifttol: subimage shift tollerance
; Rtol: cross-correlation tollerance

s1=size(img1,/dim)
s2=size(img2,/dim)
msize=s1[0]<s1[1]<s2[0]<s2[1]

if not keyword_set(npix) then npix=fix(msize*0.4)>10 ; 40% of the size
npix<=msize

if n_elements(shifttol) eq 0 then shifttol=(msize*0.01)>1 ; 1% of the
size
if not keyword_set(Rtol) then Rtol=0.9

; Subimages in img2
nsub=s2/npix
nx=nsub[0]
ny=nsub[1]
x0=npix*indgen(nx)
x1=[x0[1:*],s2[0]]-1
y0=npix*indgen(ny)
y1=[y0[1:*],s2[1]]-1
```

```
; img2 subimages in img1
xoff=lonarr(nsub)
yoff=xoff
xyccor=fltarr(nsub)
if keyword_set(outid) then img2recon=img1*0

; Cross-correlate subimages of img2 with img1
for i=0,nx-1 do $
        for j=0,ny-1 do begin
                sub=img2[x0[i]:x1[i],y0[j]:y1[j]]
                ssub=size(sub,/dim)-1

                ; Number of sub-shifts in img1
                noffx=s1[0]-ssub[0]
                noffy=s1[1]-ssub[1]
                ccor=fltarr(noffx,noffy)

                ; Correlate sub with img1
                for k=0,noffx-1 do $
                        for l=0,noffy-1 do $
 ccor[k,l]=c_correlate(sub,img1[k:k+ssub[0],l:l+ssub[1]],0)

                ; Sub image offset and cross-correlation
                mccor=max(ccor,moff)
                k=moff mod noffx
                l=moff/noffx

                xoff[i,j]=k
                yoff[i,j]=l
                xyccor[i,j]=mccor

                if keyword_set(outid) then begin
                        img2recon[k,l]=sub
                        print,'Progress: ',(i*ny+j+1.)/(nx*ny)*100,'%'
                endif
        endfor

; Check whether img2 and img1 are equal
bsame=total(xyccor lt Rtol,/pres) eq 0
bsame and= total(rebin(total(xoff,2)/ny,nx,ny)-xoff gt shifttol,/pres)
eq 0
bsame and= total(rebin(reform(total(yoff,1),1,ny)/nx,nx,ny)-yoff gt
shifttol,/pres) eq 0

if keyword_set(outid) then begin
        window
        tvscl,img1,0
        tvscl,img2,1
```

```
        tvscl,img2recon,2
        tvscl,img2-img2recon,3

        xyouts,0.1,0.7,'img1',/normal,color=100
        xyouts,0.3,0.7,'img2',/normal,color=100
        xyouts,0.5,0.7,'reconstructed img2',/normal,color=100
        xyouts,0.7,0.7,'img1 - reconstructed img2',/normal,color=100
        isurface,xyccor
endif

return,bsame
end;function image_equal
```

On 21 avr, 08:58, Fabinho <fabioviann...@gmail.com> wrote:
> thanks a lot! I will read it and get started!
> thks
>
> On 21 avr, 00:20, Brian Larsen <balar...@gmail.com> wrote:
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>> http://groups.google.com/group/comp.lang.idl-pvwave/browse_f rm/thread...
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>> Cheers,
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>> Brian
>
>> ---------- --------------
>> Brian Larsen
>> Boston University
>> Center for Space Physicshttp://people.bu.edu/balarsen/Home/IDL
>
>

Subject: Re: image correlation
Posted by jkj on Thu, 23 Apr 2009 01:46:13 GMT
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On Apr 21, 4:43 am, Fabinho <fabioviann...@gmail.com> wrote:
> Good morning Brian or everyone,
> I read the topics inhttp://groups.google.com/group/comp.lang.idl-pvwave/browse _frm/thread...,
> as you recommended.
>
> I dont know why but im still having a lot of trouble with pvwave.
> Honnestly, im not an expert in programming. First I tryed to open the

> apple routine athttp://people.bu.edu/balarsen/Home/IDL/Entries/2009/4/6_Im age_registr....
> It didnt work at all! What should I do with the two routines, do I
> have to put in the same file? the routine "wheretomulti" before, and
> than the image-registration. Right? I tryed to do it, I also tryed to
> have 2 differents files in the same folder, but when i tryed to
> compile there was a lot of synthax problems. Maybe im not using the
> software correctly? It seems that the software finds the file he is
> supposed to compile, but he doesnt understand it at all.
> After i tryed to run the code that wox made, but also didnt work, i
> changed the name of the rose picture to one picture that i had, didnt
> work.
> I would be really thankful if someone are able to help me. Im working
> for a multinational company in france, my boss gave this part to me as
> a challenge!
>
> thanks
> ps: wox's code
> CODE:
> ;-----------------------
> pro test
> path = Filepath(Subdir=['examples', 'data'], 'rose.jpg')
> read_jpeg, path, img, /true
> img = 0.3*Reform(img[0,*,*]) + 0.59*Reform(img[1,*,*]) +
> 0.11*Reform(img[0,*,*])
>
> kernelSize = [10,10]
> kernel = REPLICATE((1./(kernelSize[0]*kernelSize[1])), $
> kernelSize[0], kernelSize[1])
> img2= CONVOL(img, kernel, /CENTER, /EDGE_TRUNCATE)
>
> print,image_equal(img,img2,/outid)
> end;pro test
> ;-----------------------
> function
> image_equal,img1,img2,npix=npix,shifttol=shifttol,Rtol=Rtol, outid=outid
> ; Image offsets or scales don't matter
> ; npix: subimage pixels for cross-correlation
> ; shifttol: subimage shift tollerance
> ; Rtol: cross-correlation tollerance
>
> s1=size(img1,/dim)
> s2=size(img2,/dim)
> msize=s1[0]<s1[1]<s2[0]<s2[1]
>
> if not keyword_set(npix) then npix=fix(msize*0.4)>10 ; 40% of the size
> npix<=msize
>
> if n_elements(shifttol) eq 0 then shifttol=(msize*0.01)>1 ; 1% of the

```
>  size
>  if not keyword_set(Rtol) then Rtol=0.9
>
>  ; Subimages in img2
>  nsub=s2/npix
>  nx=nsub[0]
>  ny=nsub[1]
>  x0=npix*indgen(nx)
>  x1=[x0[1:*],s2[0]]-1
>  y0=npix*indgen(ny)
>  y1=[y0[1:*],s2[1]]-1
>
>  ; img2 subimages in img1
>  xoff=lonarr(nsub)
>  yoff=xoff
>  xyccor=fltarr(nsub)
>  if keyword_set(outid) then img2recon=img1*0
>
>  ; Cross-correlate subimages of img2 with img1
>  for i=0,nx-1 do $
>        for j=0,ny-1 do begin
>              sub=img2[x0[i]:x1[i],y0[j]:y1[j]]
>              ssub=size(sub,/dim)-1
>
>              ; Number of sub-shifts in img1
>              noffx=s1[0]-ssub[0]
>              noffy=s1[1]-ssub[1]
>              ccor=fltarr(noffx,noffy)
>
>              ; Correlate sub with img1
>              for k=0,noffx-1 do $
>                    for l=0,noffy-1 do $
>   ccor[k,l]=c_correlate(sub,img1[k:k+ssub[0],l:l+ssub[1]],0)
>
>              ; Sub image offset and cross-correlation
>              mccor=max(ccor,moff)
>              k=moff mod noffx
>              l=moff/noffx
>
>              xoff[i,j]=k
>              yoff[i,j]=l
>              xyccor[i,j]=mccor
>
>              if keyword_set(outid) then begin
>                    img2recon[k,l]=sub
>                    print,'Progress: ',(i*ny+j+1.)/(nx*ny)*100,'%'
>              endif
>        endfor
```

>
> ; Check whether img2 and img1 are equal
> bsame=total(xyccor lt Rtol,/pres) eq 0
> bsame and= total(rebin(total(xoff,2)/ny,nx,ny)-xoff gt shifttol,/pres)
> eq 0
> bsame and= total(rebin(reform(total(yoff,1),1,ny)/nx,nx,ny)-yoff gt
> shifttol,/pres) eq 0
>
> if keyword_set(outid) then begin
> window
> tvscl,img1,0
> tvscl,img2,1
> tvscl,img2recon,2
> tvscl,img2-img2recon,3
>
> xyouts,0.1,0.7,'img1',/normal,color=100
> xyouts,0.3,0.7,'img2',/normal,color=100
> xyouts,0.5,0.7,'reconstructed img2',/normal,color=100
> xyouts,0.7,0.7,'img1 - reconstructed img2',/normal,color=100
> isurface,xyccor
> endif
>
> return,bsame
> end;function image_equal
>
> On 21 avr, 08:58, Fabinho <fabioviann...@gmail.com> wrote:
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>> thanks a lot! I will read it and get started!
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>
>>> Cheers,
>
>>> Brian
>
>>> ---------- --------------
>>> Brian Larsen
>>> Boston University
>>> Center for Space Physicshttp://people.bu.edu/balarsen/Home/IDL
>
>

The compile errors probably mean you have some problems with the path setting in the environment. Of course, I only use IDL and have never seen PV-Wave so I don't know how you address the PATH issues in PV-Wave but it should be easy to check the docs.

-Kevin
