Subject: Re: Problems with ERODE and DILATE functions
Posted by David Fanning on Tue, 16 Nov 2010 15:27:24 GMT
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Oriol Güell Riera writes:

> I have a problem with the "erode" and "dilate" functions. I have a
> program which tracks ellipses, and it uses these functions to improve
> the images. However, if I try to run the program without using "erode"
> and "dilate", the program crashes, it can't keep tracking the ellipses
> (I have got a stack of images and the program stops tracking at some
> point of the tracking). I don't know why it happens because if I
> rewrite the functions to the routine, the program finishes the
> tracking. The main problem is that "erode" and "dilate" modify
> sometimes my images, they separate my ellipses sometimes, so I have to
> erase the "erode" and "dilate" functions from the prorgam. In
> principle, these functions should not interfere if I put them out of
> the routine, but actually they do.

Your program is not doing what you *think* it is doing
quite yet. I would spend some time reviewing all your
assumptions and making sure they are true. About 99
percent of the time when you "don't know why it happens",
it is because of programmer error. :-)

Cheers,

David

--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.dfanning.com/
Sepore ma de ni thui. ("Perhaps thou speakest truth.")

Subject: Re: Problems with ERODE and DILATE functions
Posted by on Tue, 16 Nov 2010 15:38:05 GMT
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On 16 nov, 16:27, David Fanning <n...@dfanning.com> wrote:
> Oriol Güell Riera writes:
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>> program which tracks ellipses, and it uses these functions to improve
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The problem is that it works fine for small stacks of images but not
for large ones, the pc crashes.
Thanks,
Oriol

Subject: Re: Problems with ERODE and DILATE functions
Posted by David Fanning on Tue, 16 Nov 2010 15:56:20 GMT
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Oriol Güell Riera writes:

> The problem is that it works fine for small stacks of images but not
> for large ones, the pc crashes.

Yes, and I presume you think it should work for large
stacks of images. That's the assumption I think I would
focus the investigation on. You assume large stacks
are similar to small stacks in all ways except size.
Are they? Does your program evolve over time to do
something you don't expect it to? Larger stacks
mean longer running times. These are just two of
the hundred or so theories I could come up with if
I had five minutes. You are going to have to play

detective this morning. Don't you watch CSI? It's
going to be FUN! :-)

Cheers,

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Subject: Re: Problems with ERODE and DILATE functions
Posted by on Tue, 16 Nov 2010 16:02:17 GMT
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On 16 nov, 16:56, David Fanning <n...@dfanning.com> wrote:
> Oriol Güell Riera writes:
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It seems I will have to do become Sherlock Holmes, because when I use

erode and dilate for the large stack it works fine, the problem is
that it detects more particles because erode and dilate separate the
pixels. Due to this, I erase erode and dilate, so I think that the
only modification in the program is that the pixels are not going to
get modified, but the rest of the program is exactly the same. The
thing that makes me go mad is that the program works with erode and
dilate and it doesn't work when I remove them. It is strange, it
should work without modifying the image.
I'll keep investigating.
Thank you again David,
Oriol

Subject: Re: Problems with ERODE and DILATE functions
Posted by James[2] on Tue, 16 Nov 2010 21:44:54 GMT
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On Nov 16, 8:02 am, Oriol Güell Riera <oriolguellri...@gmail.com>
wrote:
> On 16 nov, 16:56, David Fanning <n...@dfanning.com> wrote:
>
>
>
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> Thank you again David,
> Oriol

Can you post the code for the program you're working on? As David says, it sounds like there is some unintended behavior in the program that you're not accounting for.

One thing to consider: DILATE and ERODE are converting your data to Byte type unless you are using both the /GREY and /PRESERVE_TYPE keywords. Perhaps your input data is in a larger type, and when you remove the DILATE/ERODE calls, the data is too large for later stages of processing.

Subject: Re: Problems with ERODE and DILATE functions
Posted by on Wed, 17 Nov 2010 07:57:50 GMT
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On 16 nov, 22:44, James <donje...@gmail.com> wrote:
> On Nov 16, 8:02 am, Oriol Güell Riera <oriolguellri...@gmail.com>
> wrote:
>
>
>
>> On 16 nov, 16:56, David Fanning <n...@dfanning.com> wrote:
>
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> Byte type unless you are using both the /GREY and /PRESERVE_TYPE
> keywords. Perhaps your input data is in a larger type, and when you
> remove the DILATE/ERODE calls, the data is too large for later stages
> of processing.

Here's the routine. The main program calls it in some point to find
the particles and compute the center of mass position and the
orientation:

```
-----------------------------------------------
function tracking,cube,num,result

result=cube

nx=n_elements(cube(*,0,0))
```

```
ny=n_elements(cube(0,*,0))
nz=n_elements(cube(0,0,*))
bloblist=fltarr(4)
blank=bytarr(nx,ny)
the=fltarr(num*nz)
k=-1
oa=0

for j=0,nz-1 do begin
        o=0
        if j eq oa*10 then begin
                message,'slice '+string(j)+' of '+string(nz-1),/inf
                oa=oa+1
        endif
        slice=result(*,*,j)

        ;The next 5 lines are the ones that I'm trying to erase, but
when I put them off the program crashes!
        lilsquare=bytarr(3,3)+1b
        bigsquare=bytarr(5,5)+1b
        ; next three lines do a good job removing tiny islands and
craters
        slice=erode(slice,lilsquare)
        slice=dilate(slice,bigsquare)
        slice=erode(slice,lilsquare)


        s=size(slice)
        w=where(slice eq 1,nw)
        if (nw gt 0) then begin
                while (nw gt 0) do begin
                        ypos2=w(0)/(s[1])
                        xpos2=w(0)-(ypos2*s[1])
                        region=search2d(slice,xpos2,ypos2,1,1)
                        if (n_elements(region) gt 1) then begin
                                k=k+1
                                o=o+1
                                ypos=region/(s[1])
                                xpos=(region-(ypos*s[1]))
                                numpts=n_elements(region)
                                mass=numpts
                                massxy=slice(xpos,ypos)
                                xbar=total(xpos*massxy)/mass
                                ybar=total(ypos*massxy)/mass
                                rx=xpos-xbar
                                ry=ypos-ybar
                                i11=total(rx*rx)/mass
                                i22=total(ry*ry)/mass
```

```
                        i12=total(rx*ry)/mass
                        trace=i11+i22
                        det=i11*i22-i12*i12
                        eval1=trace/2+sqrt(trace^2/4-det)
                        xeix1=1./sqrt(1.+((eval1-i11)/i12)^2)
                        yeix1=(eval1-i11)/i12*1./sqrt(1.+
((eval1-i11)/i12)^2)
                        if i12 eq 0 then begin
                              xeix1=1.
                              yeix1=0.
                        endif
                        if (j eq 0) then begin
                              the(k)=!pi-atan2(yeix1,xeix1)
                        endif else begin
                              theta1=!pi-atan2(yeix1,xeix1)
                              theta2=!pi-atan2(-yeix1,-
xeix1)
                              if (abs(theta1-the(k-num)) gt
2) then begin
                                    the(k)=theta2
                              endif else begin
                                    the(k)=theta1
                              endelse
                        endelse
                        ybar=float(ny)-temporary(ybar)
                        bloblist = [[bloblist],
[xbar,ybar,the(k),j]]
                        if o gt num then begin
                              print,'Slice',j,' has a
problem'
                        endif
                        slice(region) = 255b
                        w=where(slice eq 1,nw)
                  endif
            end
      endif else begin
            message,'WARNING: no pixels above threshold',/inf
      endelse
      result(*,*,j)=slice
endfor
; strips off first empty row
bloblist=bloblist(*,1:*)

return, bloblist

end
---------------------------------------
```

The input images are thresholded, they only have 0 and 1. Do you suggest to write slice=byte(temporary(slice)) instead of erode and dilate to transform it to byte type?

Thanks again David and James
Oriol

Subject: Re: Problems with ERODE and DILATE functions
Posted by guillermo.castilla.ca on Wed, 17 Nov 2010 20:05:22 GMT
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Hola Oriol,

I haven't read thoroughly your post or your code, but since you say that "erode" and "dilate" modify separate your ellipses sometimes, it may be the case that then you have too many individual regions and your code gets too slow. Instead of using WHERE and SEARCH_2D, you can use LABEL_REGION and HISTOGRAM to locate individual regions in a much more efficient way:

```
hst= histogram(label_region(slice, min=1, omax=nreg, rev=r)
for j=0L, nreg-1 do begin
  region= r[r[j]:r[j+1]-1]
  ...
  numpts= hst[j]
  ...
endfor
```

Also, instead of dilate and erode, you could simply use the MEDIAN function to remove small regions or holes within small regions

Bona sort!

Guillermo

Subject: Re: Problems with ERODE and DILATE functions
Posted by on Thu, 18 Nov 2010 08:55:06 GMT
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On 17 nov, 21:05, Guillermo <guillermo.castilla.castell...@gmail.com> wrote:
> Hola Oriol,
>
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> function to remove small regions or holes within small regions
>
> Bona sort!
>
> Guillermo

Hola Guillermo

Thank you very much for your suggestions!
I have thought in another way to approach the problem, and it seems
that it works fine, fingers crossed!

Moltes gràcies per l'ajuda!

Oriol
