
Subject: Clsuter analysis wiht IDL
Posted by [dw](#) on Fri, 23 Feb 2001 15:09:30 GMT
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I am trying to use the cluster analysis utility in IDL, and I can't work it out. Perhaps due to my lack of knowledge in the statistical field.....

I have a 2D-image (658x658) with a single band of info (CT x-ray intentities) that I want to classify (into three classes) using cluster analysis. I assume I have to use the CLUST_WTS function first and then the CLUSTER function, but I can't work it out.
The on-line help isn't very helpful on this topic....

If I use
weights = clust_wts(image, n_clusters=3), with image= intarr(658x658) I get alot of floating errors.
Do I need to reform the image to (658x658,1) before using the clust_wts function? Doesn't seem to work either, though. Also how do I get the cluster numbers back as an overlay of my image? so that I can actually see the result of the classification.

Has anybody worked on cluster analysis using IDL?

Thanks for any help!
Dorthe

--
Posted from mail.isva.dtu.dk [192.38.88.3]
via Mailgate.ORG Server - <http://www.Mailgate.ORG>

Subject: Re: Clsuter analysis wiht IDL
Posted by [Benno Puetz](#) on Wed, 28 Feb 2001 17:09:36 GMT
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Dorthe Wildenschild wrote:

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> out. Perhaps due to my lack of knowledge in the statistical field.....
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- > alot of floating errors.
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- > function? Doesn't seem to work either, though.

What you want is probably REFORM the image to (1,658x658), one variable (intensity) and 432964 observations (pixels)

Using three clusters you will (likely) end up with one for background and two for low and high intensities in the CT image, respectively, ...

- > Also how do I get the
- > cluster numbers back as an overlay of my image? so that I can actually see
- > the result of the classification.

use something like

```
ref_img=REFORM(image,1,658*658)
weights = clust_wts(ref_img, n_clusters=3)
cls=cluster(ref_img,weights,n_cluster=3)
tvsc1,reform(cls,658,658)
```

and you should have the clusters in different grays (or colors, depending on your settings)

- >
- >
- > Has anybody worked on cluster analysis using IDL?
- >

Your question showed me that such a command exists in IDL ...

--

Benno Puetz
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Subject: Re: Clsuter analysis wiht IDL
Posted by [Craig Markwardt](#) on Thu, 01 Mar 2001 17:43:06 GMT
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dw@isva.dtu.dk (Dorthe Wildenschild) writes:

- > =====_524776338==_.ALT
- > Content-Type: text/plain; charset="us-ascii"; format=flowed

```

>
> <Perhaps you could achieve what you desire with this code, which simply
> <finds the non-zero pixels:
>
> wh = where(image GT 0, ct)
> if ct EQ 0 then message, 'ERROR: the image is blank!'
> x = wh MOD 658 ; form x pixel positions
> y = floor(wh / 658) ; form y pixel positions
>
> xy = transpose([[x],[y]]) ; compute the 2-d scatter positions
> weights = clust_wts(xy, n_clusters=3)
> etc.
>
> <I haven't tried this, so it may take some tweaking. Good luck,
> <Craig
>
> I'm such a beginner at this I don't know what the MOD function does? (no
> on-line help listing for it)
> When trying to transpose, IDL corrects me with
> Arrays are allowed 1 - 8 dimensions

```

MOD is documented as the "modulo" function. You may have to scroll to see the documentation entry in the index. Since WHERE "pretends" that your array is 1-d, you have to reconstruct the x and y positions by dividing by the number of columns, and taking the remainder (=x) and quotient (=y).

Here is an example with some simulated data. The TRANSPOSE command works as advertised. The GAUSS2 simply generates a 2-d gaussian function, and is available from my web page <http://cow.physics.wisc.edu/~craigm/idl/idl.html>

This script finds all three clusters successfully, but it shows that the routine is not optimal since it doesn't find the cluster centers.

Would you consider conferring with Mr. Rojas on his question about clusters and kmeans?

Craig

```

;; Simulate some data. Three clusters at (2,3), (-3,1), (1,-2)
x = findgen(100)*0.1 - 5. & y = x
xx = x # (y*0 + 1)
yy = (x*0 + 1) # y
z = 30 * gauss2(xx, yy, [2D, 3D, .2, 1]) + $
    10 * gauss2(xx, yy, [-3D, 1D, .2, 1]) + $
    20 * gauss2(xx, yy, [1D, -2D, .2D, 1])

```

```
zi = floor(z) ;; Convert to integer

;; Find the positions of significant data points
wh = where(z GT 5, ct)
if ct EQ 0 then message, 'ERROR: no signif points!'
xi = x(wh MOD 100)
yi = y(floor(wh/100))
xy = transpose([[xi],[yi]])
weights = clust_wts(xy, n_clusters=3)

plot, xi, yi, psym=3
oplot, weights(0,*), weights(1,*), psym=1, symsize=3

--
```

Craig B. Markwardt, Ph.D. EMAIL: craigmnet@cow.physics.wisc.edu
Astrophysics, IDL, Finance, Derivatives | Remove "net" for better response

Subject: Re: Clsuter analysis wiht IDL
Posted by [Gonzalo Rojas](#) on Fri, 02 Mar 2001 17:45:37 GMT
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Hi Dorthe:

what is the difference between the obsolete IDL procedure "kmeans" and the new "cluster" ?... In theory, with this procedures we get the same results, but I tested it with the same input parameters (same image, quantity of clusters, etc, etc), and we got different results...

could you please send me the answers to my e-mail to, because I don't read this newsgroup very often...

thanks in advance...

Gonzalo Rojas

Dorthe Wildenschild wrote:

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File Attachments

1) [grojasy.vcf](#), downloaded 159 times
