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Subject: Re: Is there function about how to compute joint probability distribution?

Posted by [bente](#) on Tue, 13 Nov 2001 09:44:40 GMT

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Xiuying Wang <xiuying@cs.usyd.edu.au> wrote in message  
news:<3BEF063B.46048EA1@cs.usyd.edu.au>...

> Hi,  
> I am doing research work now and I need to use joint probability  
> distribution and marginal probability distribution. I wonder whether you  
> can tell me how to do that in the shortest time, please?  
> Many thanks!  
>  
> Best wishes,  
> Xiu Ying

Hi,  
I'm using Mutual Information on 3D-Arrays, so there I need the  
JointProbability between the Intensities of both arrays.  
I've done this with the Hist\_2D Function.

Hist\_2D gives the two dimensional density function of both arrays. In  
words, it gives the number of corresponding Pixels which have certain  
intensities in either array (e.g. low intensity in A and high  
intensity in B,...)

To get the joint probability I simply divided by the Total of the  
histogram.

Here the part of my program for the mutual information  
; mi, mutual information

```
if imeasure eq 4 then begin
```

```
hist = hist_2d( a, b )  
hist = rotate(hist,7)  
hist = float(hist)
```

```
pxy = hist / total(hist)  
px = fltarr(256)  
py = fltarr(256)
```

```
for j = 0, 255 do begin  
  px(j) = total(pxy(j,*))  
  py(j) = total(pxy(*,j))  
endfor  
col = replicate(1.0,256)  
px_mat = px # col  
py_mat = py # col
```

```
py_mat = rotate(py_mat,1)
pxxyy = px_mat * py_mat
pxyn = pxy * 0.0
index = where( pxxyy gt 0.0 and pxy gt 0.0, icount2)
;if (icount2 gt 0) then $
pxyn[index] = pxy[index] * alog( pxy[index] / pxxyy[index]) /
alog(2.0)
mi = total(pxyn)

endif
```

I don't know exactly how your problem looks like, but maybe this can help.

Kay

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