
Subject: help IDL with some equations implementation and optimized coding

Posted by [lila hadji](#) on Tue, 01 Jun 2010 05:30:48 GMT

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Dear everybody,

I tried to implement the dictionary update step in the Method of Optimal Directions, as explained in the paper (basically equations 8, 9, 17, 18 and 25)

```
%      "Method of optimal directions for frame design",  
%      K. Engan, S. O. Aase, and J. H. Husøy,  
%      in Proc. ICASSP, Phoenix, AZ, Mar. 1999, pp. 2443-2446.
```

First link of the page:

```
http://scholar.google.com/scholar?hl=fr&q=%22Method+of+o  
ptimal+directions+for+frame+design%22&btnG=Rechercher&as_ylo=&as_vis=0
```

The problem is that I didn't obtain good results - as it is expected within the paper - with my implementation and I was wondering if anyone can check out the code and the equations in the paper and help me out why my code does not give the expected results and if there are any improvements I can do on the code to get rid of the for-loop, please?

Here is the version with the loop.

```
;;#IDL Code#  
$Main$  
  
;N=16 : size of each sample  
;m=64: number of samples  
;k=32: number of atoms in the dictionary to be learned  
  
;Y=randomn(seed,m,n) : samples  
;D=randomn(seed, k,n): dictionary to be learned  
;X=randomn(seed,m,k): sparse codes to construct in the domain D  
  
B=dblarr(N,k,/nozero)  
ones=dblarr(N,/nozero)  
ones(*)=1  
  
A=invert(transpose(x)#X,/double)  
R=Y-D##X  
  
for i=0,k-1 do begin  
    xi=X(*,i)
```

```
B(*,i)=total((ones##xi)*R,1)
end
```

```
delta=A##B
D=D+transpose(delta)
end
```

```
:: #IDL Code#
```

Thank you very much for your help in advance.
Cheers
Lila
