Subject: Performance of a loop
Posted by azM on Thu, 18 Oct 2001 06:43:38 GMT
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How can i speed up this procedure? It steps through a matrix of either
64x64x64, 128x128x128 or in the worst case 256x256x256.

```
<==BEGIN IDL==>
FOR i = init, limit, 1 DO BEGIN
 FOR j = init, limit, 1 DO BEGIN
  FOR k = init, limit, 1 DO BEGIN
   X=img_a(i:kernel_dim+i,j:kernel_dim+j,k:kernel_dim+k)
   Y=img_b(i:kernel_dim+i,j:kernel_dim+j,k:kernel_dim+k)
   sign_prob_map=TM_TEST(X,Y)
   spm_plot_statistic(i,j,k)= sign_prob_map(0)
   spm_plot_significance(i,j,k)= sign_prob_map(1)
  ENDFOR
 ENDFOR
ENDFOR
<== END IDL ==>
```

Thanks in advance,

Bob
(B.C.Hamans<<at>>student.tue.nl)

Subject: Re: Performance of a loop
Posted by Paul van Delst on Mon, 22 Oct 2001 15:07:58 GMT
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Martin Downing wrote:
>
> Paul,
> Im curious, can you explain why your modification should run faster?

The array access indices are listed as: [i,j,k]

The original loop order was
>>> FOR i = init, limit, 1 DO BEGIN
>>> FOR j = init, limit, 1 DO BEGIN
>>> FOR k = init, limit, 1 DO BEGIN

I suggested changing it to:
>> FOR k = init, limit, 1 DO BEGIN
>> FOR j = init, limit, 1 DO BEGIN
>> FOR i = init, limit, 1 DO BEGIN

i.e. reversing the i and k looping. IDL is like fortran in that array numbers are stored continguously in the order of i->j->k (opposite to C) so by looping over k as the innerloop, the access speed may suffer in that rather than loading numbers from adjacent memory locations, jumps over the i and j dimension would be required to load the next k-dimensioned number. Depending on the size of the arrays, this could incolve a lot of memory copying/gymnastics == time hog. Others more knowledgable than me about hardware would now start talking about cache
lines, translation lookaside buffer misses and other computey-type esoterica.

The upshot: always try to access memory contiguously.

paulv

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