
Subject: Re: matrix multiplication of 2 three-dimensional arrays
Posted by thomas.jagdhuber@dlr on Wed, 20 Aug 2008 19:53:16 GMT
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On 20 Aug., 18:11, Jeremy Bailin <astroco...@gmail.com> wrote:

> On Aug 20, 8:22 am, "thomas.jagdhuber" <thomas.jagdh...@gmail.com>
> wrote:

>

>> Dear experts,

>

>> I would like to matrix multiply two matrices with dimensions

>> [3,3,1500]. means: 1500 times a matrix multiplication of 2 matrices

>> with dimension [3,3]

>> I could do this with a for loop over the dimension [1500] but i

>> suppose this is not very elegant. Is there any other way to do this

>> time-efficient.

>

>> Best regards,

>

>> thomas

>

> My IDL-foo feels strong today... let's see:

>

> If A and B are 3x3, then C = A ## B is equivalent to:

>

> q = rebin(indgen(3),3,3)

> p = rebin(reform(indgen(3),1,3),3,3)

> c = total(rebin(reform(a[q,p],1,3,3),3,3,3) * reform(b[* ,q],3,3,3), 2)

>

> Adding an extra dimension on the end of that gets tricky, but I think

> the following should work if A and B are each 3x3xNMATRIX and you want

> C to be a 3x3xNMATRIX array where each C[* ,*,i] = A[* ,*,i] ##

> B[* ,*,i]:

>

> c = total(rebin(reform((a[q,p,*])[0:2,3*lindgen(3),*],1,3,3,nmatrix),

> 3,3,3,nmatrix) * reform(b[* ,q,*],

> 3,3,3,nmatrix), 2)

>

> Incidentally, does anyone have a better way of doing the (a[q,p,*])

> [0:2,3*lindgen(3),*] bit of it? The problem is that if A, Q and P are

> each 3x3 then A[Q,P] is 3x3, but if A is 3x3xN then A[Q,P,*] is 9x9xN.

>

> If I see another reform today, I'm going to scream. ;-)

>

> -Jeremy.

Thank you all, very much!

I like of course the code of jeremy most, but i think paolo's

suggestions is the most efficient one. But let us see, i will make some investigations...

Best regards,

thomas
