Subject: Re: matrix log and exp
Posted by jeyadev on Fri, 19 Apr 2002 17:21:03 GMT
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In article <a9n7dq$4hu$1@news.wrc.xerox.com>,
Surendar Jeyadev <jeyadev@wrc.xerox.bounceback.com> wrote:
> In article <a9kgr4$ur8$1@scavenger.euro.net>,
> G Karas <jacobianat@gmx.net> wrote:
>> Hi group,
>> one quickie and possibly difficult:
>>
>> IDL does not have a matrix logarithm logm and matrix
>> exponent expm function. I was thinking of calling lapack
>> routines which do it, but have no experience with lapack
>> or FORTRAN. Anyone with any tips on this one?
>
> It depends on the matrix. Can you diagonlise it? It so,
> you are done. You will need a support package to do the
> linear algebra, though.
>
> .....
>
> The trick is to do the basic operation in the diagonal
> representation and then transform back. If you can
> write the operation as a power series, then can see
> why this works.
>
> The same should work for the logarithm, if the e.values
> are all greater than zero.

I forgot to mention that this kind of thing is routine
in quantum mechanical calculations. You will find
information on things like exp(A) in any decent text:
try Schiff or Merzbacher or Gottfried or ....
What I described is routinely used is such calculations.

Hope this helps, but it does assume use of a linear
algebra package for determining the the eigenvalues
and eigenvectors.

Repeated matrix multiplications are tricky! I would
watch out .....

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