Subject: Re: generalized eigenvectors
Posted by Randall Skelton on Tue, 16 Apr 2002 10:48:37 GMT
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On Mon, 15 Apr 2002, Ralf Flicker wrote:

> In working on large sparse arrays it has become crucial to make the
> SVD more efficient than O(n^3), but that seems to be easier said
> than done. Do you know of an efficient implementation of the Laczos
> bidiagonalization with selective reorthogonalization? I have not
> been able to accomplish it - with complete, explicit
> reorthogonalization it actually gets even worse than O(n^3).

I have had this same problem in the past when attempting to solve large Jacobian matrices. I haven't tried to implement the algorithm you described, but I have definitely thought about trying it. I probably won't get back to working on my code that relies on SVD for another month or so but I seem to recall that the SVD was near the top of my "need to optimize" list. Sorry I can't be of more help but at the moment CPU cycles are cheaper than my time is... If you find anything in the mean time, please post it!

> More to the point, has anyone _ever_ managed to bring down the SVD
> significantly below O(n^3) for sparse arrays? Pointers and
> suggestions welcome.

You may want to look at http://www.nersc.gov/research/SIMON/trlan.html and the links therein. Unfortunately, the code is f90 so you'll need a compiler as well as the BLAS and LAPACK libraries. If (read: when) I get around to needing this, I will probably write a set of C DLM wrappers around the public f90 functions.

Cheers,
Randall