

# Re: Fast solution to very small eigenvalue problem

**Source:** <http://sci.tech-archive.net/Archive/sci.math.num-analysis/2004-06/0408.html>

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Mark Mackey wrote:

> *Hi all.*

>

> *I need to find the eigenvector corresponding to the largest eigenvalue*

> *of a 4x4 matrix very quickly (because I'm doing it on hundreds of*

> *thousands of 4x4 matrices). The current code I'm maintaining has a*

> *simple Jacobi solver, which is (a) slow (it only does 30K matrices/s on*

> *my PC), and (b) probably overkill, as it returns all of the*

> *eigenvectors. I've vaguely looked at LAPACK etc, but those routines are*

> *AFAIK optimised for good performance on large matrices, not small ones.*

>

> *Does anyone have any suggestions as to the most efficient way to solve*

> *this problem? Extreme accuracy is not required. 4x4 is probably small*

> *enough that there's an analytic solution :).*

>

If this derives from a physical problem, perhaps you can use Rayleigh's variational principle.

– Ken