

**Scherzinger, W. M.; Dohrmann, C. R.**

**A robust algorithm for finding the eigenvalues and eigenvectors of  $3 \times 3$  symmetric matrices.**

(English) [Zbl 1197.65037](#)

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Summary: Many concepts in continuum mechanics are most easily understood in principal coordinates; using these concepts in a numerical analysis requires a robust algorithm for finding the eigenvalues and eigenvectors of  $3 \times 3$  symmetric matrices. A robust algorithm for solving this eigenvalue problem is presented along with an analysis of the algorithm. The special case of two or three nearly identical eigenvalues is examined in detail using an asymptotic analysis. Numerical results are shown that compare this algorithm with existing methods found in the literature. The behavior of this algorithm is shown to be more reliable than the other methods with a minimal computational cost.

**MSC:**

**65F15** Numerical computation of eigenvalues and eigenvectors of matrices

Cited in **3** Documents

**Keywords:**

eigenvalues; eigenvectors; principal coordinates; symmetric matrices; robust algorithm; numerical results

**Full Text:** [DOI](#)

**References:**

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