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Fast computation of QR factorisation and eigenvalue decomposition via one-sided plane rotations

By using one-sided Givens rotations and adequate block strategy in choosing pivot elements, it is possible to attain the speed of the LAPACK implementation of the QR factorisation which uses BLAS 3 routines. The advantage of the new approach is simpler implementation. Similar approach also gives very good results in computing eigenvalues and eigenvectors of symmetric matrices, where one-sided Jacobi-type rotations are applied to a symmetric factorization obtained in double of the working precision.

Coauthors of this work are Krešimir Veselić i Zlatko Drmač.