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MATRIX RANK CERTIFICATION*

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Abstract. Randomized algorithms are given for computing the rank of a matrix over a field of characteristic zero with conjugation operator. The matrix is treated as a black box. Only the capability to compute matrix×column-vector and row-vector×matrix products is used. The methods are exact, sometimes called seminumeric. They are appropriate for example for matrices with integer or rational entries. The rank algorithms are probabilistic of the Las Vegas type; the correctness of the result is guaranteed.

Key words. Matrix rank, Minimal polynomial, Black box matrix, Seminumeric computation, Exact arithmetic, Randomized algorithms, Las Vegas algorithms.

AMS subject classifications. 15A03, 65F50, 68W30.

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