

Numerical Operations Among Rational Matrices: Standard Techniques and Interpolation .

Petr Hušek; Michael Šebek; Jan Štecha

Abstract: Numerical operations on and among rational matrices are traditionally handled by direct manipulation with their scalar entries. A new numerically attractive alternative is proposed here that is based on rational matrix interpolation. The procedure begins with evaluation of rational matrices in several complex points. Then all the required operations are performed consecutively on constant matrices corresponding to each particular point. Finally, the resulting rational matrix is recovered from the particular constant solutions via interpolation. It may be computed either in polynomial matrix fraction form or as matrix of rational functions. The operations considered include addition, multiplication and computation of polynomial matrix fraction form. The standard and interpolation methods are compared by experiments.

Keywords:

AMS Subject Classification: 93B;