Rational interpolation and root-finding methods

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Root seeking algorithms constitute indispensable components of problem solving. The aim of this paper is to continue investigation conducted in [1] and [2], regarding fixed point iterative methods for solving nonlinear equations based on particular type rational interpolant. Rational interpolants of different kinds will be discussed and analyzed. A systematization will be conducted with a purpose to assemble efficient multipoint iterative procedures for solving nonlinear equations. This formidable task already commenced in cited papers. Further investigations require access to and feedback from different interlocking theories such as Stability, Interpolation, Interval Mathematics, Complexity and Dynamics. As a result, local and global convergence conditions are derived.

References

[1] M. S. Petković, B. Neta, L. D. Petković, J. Džunić, Multipoint methods for solving nonlinear equations: A survey, App. Math. Comput. **226** (2014), 635–660.

[2] J. Džunić, I. Damnjanović, General approach to constructing optimal multipoint families of iterative methods using Hermite's rational interpolation, J. Comput. Appl. Math. **321** (2017), 261–269.