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ETNA
Kent State University
etna@mcs.kent.edu

A QUADRATICALLY CONVERGENT BERNOULLI-LIKE ALGORITHM FOR SOLVING MATRIX POLYNOMIAL EQUATIONS IN MARKOV CHAINS[*]

C. HE [†], B. MEINI [‡], N.H. RHEE [§], AND K. SOHRABY [¶]

Abstract. A quadratically convergent algorithm is developed for solving matrix polynomial equations arising in M/G/1 and G/M/1 type Markov chains. The algorithm is based on the computation of generalized block eigenvalues/vectors of a suitable pair of matrices by means of a Bernoulli-like method. The use of the displacement structure allows one to reduce the computational cost per step. A shifting technique speeds up the rate of convergence.

Key words. polynomial matrix equations, Markov chains, generalized eigenvalues/eigenvectors, displacement structure.

AMS subject classifications. 15A24, 60J22, 65F15.

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[†]Sprint Corporation, Network Planning and Design, 7171 West 95th Street Overland Park, KS 66212, U.S.A.

[‡]Dipartimento di Matematica, Università di Pisa, via Buonarroti 2, 56127 Pisa, Italy.

[§]Dept. of Mathematics and Statistics, University of Missouri-Kansas City, Kansas City, MO 64110, U.S.A.

[¶]Dept. of Computer Science and Telecommunications, University of Missouri-Kansas City, Kansas City, MO 64110, U.S.A. This research was supported by DARPA under Grant F0316.