CASTS TALKS

2012 Special Program in Applied

Mathematics and Applied Mechanics

The optimal iterative algorithm to solve nonlinear algebraic equations

2012 - 03 - 14 (Wed.)
15:00 - 17:00
308, Mathematics Research Center Building (ori. New Math. Bldg.)

An iterative algorithm based on the concept of best vector is proposed to solve a system of nonlinear algebraic equations (NAEs): F(x)=0. In terms of the residual vector F and a monotonically increasing positive function Q(t) of a time-like variable t, we define a future cone in the Minkowski space, wherein the discrete dynamics of the proposed algorithm evolves. A new method to approximate the best vector is developed, and we find a critical value of the weighting parameter in the descent vector for an iterative algorithm to solve x from the NAEs, which we label as the best vector optimal iterative algorithm (BVOIA). Some numerical examples are used to validate the performance of the BVOIA: a very fast convergence rate in finding the solution is observed.

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