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An explicit algorithm for solving monotone variational inequalities. (English) Zbl 07418844

Summary: In this paper, we are interested in the generalized variational inequality problem in real Hilbert spaces. We propose an explicit proximal method which requires only one proximal step and one mapping evaluation per iteration and also uses an adaptive step-size rule that enables to avoid the prior knowledge of the Lipschitz constant of the involved mapping. Weak convergence of the proposed scheme is established under standard assumptions. Under strong monotonicity, we present the $R$-linear convergence rate of our new method. Intensive numerical experiments illustrate the advantages and the applicability of our scheme. Moreover, our work generalizes theoretically several recent results in this field.

MSC:
49J40 Variational inequalities
49J27 Existence theories for problems in abstract spaces
58E35 Variational inequalities (global problems) in infinite-dimensional spaces
47J20 Variational and other types of inequalities involving nonlinear operators (general)

Keywords:
variational inequality; monotonicity; weak convergence; linear convergence; gene expression; tomography

Software:
AIR tools

Full Text: DOI

References: