

Title: A hybrid proximal extragradient self-concordant primal barrier method for monotone variational inequalities.

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In this work we present we present a primal interior-point hybrid proximal extragradient (HPE) method for solving a monotone variational inequality over a closed convex set endowed with a self-concordant barrier and whose underlying map has Lipschitz continuous derivative. The method mixes two types of iterations, namely: those which follow an ever changing path within a certain “proximal interior central surface”, which approach the solution set, and those which correspond to a large-step version of the HPE method due to Solodov and Svaiter, and whose iteration complexity was recently established by Monteiro and Svaiter. Due to its first-order nature, the iteration-complexity of the method is shown to be faster than its 0-th order counterparts such as Korpelevich’s algorithm and Tseng’s modified forward-backward splitting method.