

Inertial viscosity Mann-type subgradient extragradient algorithms for solving variational inequality and fixed point problems in real Hilbert spaces

ZAHOOR AHMAD RATHER^{1,✉} 
RAIS AHMAD² 

¹ Department of Mathematical sciences,
Islamic University of Science and
Technology, Awantipora - 192122, India.
zahoor.rather@iust.ac.in

² Department of Mathematics, Aligarh
Muslim University, Aligarh 202002,
India.
rahmad.mm@amu.ac.in

ABSTRACT

This paper presents two inertial viscosity Mann-type extrapolated algorithms for finding a common solution to the variational inequality problem involving a monotone and Lipschitz continuous operator and the fixed-point problem for a demicontractive mapping in real Hilbert spaces. The proposed algorithms feature an adaptive step size strategy, computed iteratively, which circumvents the need for prior knowledge of the operator's Lipschitz constant. Under appropriate assumptions, we establish two strong convergence theorems guaranteeing the robustness of the methods. Furthermore, we provide a comparative performance analysis of the proposed algorithms against some existing strongly convergent schemes, supported by numerical experiments with MATLAB-based graphical illustrations.