

## On the System of Split Equilibrium and Fixed Point Problems in Real Hilbert Spaces

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**Abstract :** In this paper, a new algorithm for solving the system of split equilibrium and fixed point problems in real Hilbert spaces is considered. The equilibrium bifunction involves a finite family of pseudo-monotone mappings, which is an improvement over monotone operators. More so, it turns out that the solution of the finite family of nonexpansive mappings. The regularized parameters do not depend on Lipschitz constants. Also, the computations of the stepsize, which plays a crucial role in the convergence analysis of the proposed method, do require prior knowledge of the norm of the involved bounded linear map. Furthermore, to speed up the rate of convergence, an inertial term technique is introduced in the proposed method. Under standard assumptions on the operators and the control sequences, using a modified Halpern iteration method, we establish strong convergence, a desired result in applications. Finally, the proposed scheme is applied to solve some optimization problems. The result obtained improves numerous results announced earlier in this direction.

**Keywords :** equilibrium, Hilbert spaces, fixed point, nonexpansive mapping, extragradient method, regularized equilibrium

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