

A Multiple Zero Finding Hybrid Genetic Algorithm for Discontinuous and Non-Differentiable Functions

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Abstract

In this paper, we present a hybrid genetic algorithm for finding multiple roots of non-linear functions with known multiplicity. Genetic algorithms (GA) have strong global searching capabilities but restricted convergence efficiency later, whereas optimal iterative methods offer good local convergence efficiency but strict initial approximation constraints. Combining GA and optimal iterative methods, a multiple root solver is proposed for a class of non-linear functions having discontinuity and non-differentiability. The proposed hybrid GA is then applied to various applied medical science problems i.e., blood rheology, fluid permeability in biogels, thermal regulation of the body etc. A comparison of computational time and other parameters of genetic algorithm and hybrid genetic algorithm show that our proposed hybrid genetic algorithm outperforms the conventional multiple root solvers and the GA.

References

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