

## A new hybrid firefly algorithm for complex and nonlinear problem

### Abstract

Global optimization methods play an important role to solve many real-world problems. However, the implementation of single methods is excessively preventive for high dimensionality and nonlinear problems, especially in term of the accuracy of finding best solutions and convergence speed performance. In recent years, hybrid optimization methods have shown potential achievements to overcome such challenges. In this paper, a new hybrid optimization method called Hybrid Evolutionary Firefly Algorithm (HEFA) is proposed. The method combines the standard Firefly Algorithm (FA) with the evolutionary operations of Differential Evolution (DE) method to improve the searching accuracy and information sharing among the fireflies. The HEFA method is used to estimate the parameters in a complex and nonlinear biological model to address its effectiveness in high dimensional and nonlinear problem. Experimental results showed that the accuracy of finding the best solution and convergence speed performance of the proposed method is significantly better compared to those achieved by the existing methods.