

## **New modified controlled bat algorithm for numerical optimization problem**

### **ABSTRACT**

Bat algorithm (BA) is an eminent meta-heuristic algorithm that has been widely used to solve diverse kinds of optimization problems. BA leverages the echolocation feature of bats produced by imitating the bats' searching behavior. BA faces premature convergence due to its local search capability. Instead of using the standard uniform walk, the Torus walk is viewed as a promising alternative to improve the local search capability. In this work, we proposed an improved variation of BA by applying torus walk to improve diversity and convergence. The proposed Modern Computerized Bat Algorithm (MCBA) approach has been examined for fifteen well-known benchmark test problems. The finding of our technique shows promising performance as compared to the standard PSO and standard BA. The proposed MCBA, BPA, Standard PSO, and Standard BA have been examined for well-known benchmark test problems and training of the artificial neural network (ANN). We have performed experiments using eight benchmark datasets applied from the worldwide famous machine-learning (ML) repository of UCI. Simulation results have shown that the training of an ANN with MCBA-NN algorithm tops the list considering exactness, with more superiority compared to the traditional methodologies. The MCBA-NN algorithm may be used effectively for data classification and statistical problems in the future.