Parameter Optimization in Fuzzy Flip-Flop Based Neural Networks

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Abstract: This paper presents a method for optimizing the parameters of Multilayer Perceptron Neural Networks (MLP NN) consisting of fuzzy flip-flops (F3) based on various operations using Bacterial Memetic Algorithm with the Modified Operator Execution Order (BMAM). In early work, the authors proposed the gradient based Levenberg-Marquardt (LM) algorithm for variable optimization. The BMAM local and global search evolutionary approach executes several LM cycles during the bacterial mutation after each mutational step, using the LM method more efficiently. Numerical experiments were performed to show the function approximation capability of different types of FNNs trained with LM method and the BMAM algorithm.