Function Approximation Capability of a Novel Fuzzy Flip-Flop Based Neural Network

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Abstract: The function approximation capability of various connectionist systems has been one of the most interesting problems. A method for constructing Multilayer Perceptron Neural Networks (MLP NN) with the aid of fuzzy operations based flip-flops able to approximate single and multiple variable functions is proposed. This paper introduces the concept of fuzzy flip-flop based neural network, particularly by deploying three types of fuzzy flip-flops as neurons. A comparative study of feedbacked fuzzy J-K and two kinds of fuzzy D flip-flops used as neurons, based on fuzzy algebraic, Yager, Dombi, Hamacher and Frank operations is given. Simulation results are presented for several test functions.