Abstract

This paper proposes a new version of the standard particle swarm optimization (SPSO) algorithm to train a neural network (NN). The improved PSO, called the wPSOd_CV algorithm, is the improved version of the PSOd_CV algorithm presented in a previous study. The wPSOd_CV algorithm is introduced to solve the issue of premature convergence of the SPSO algorithm. The proposed wPSOd_CV algorithm is used in a co-design architecture. Experimental results confirmed the effectiveness of the NN trained by the wPSOd_CV algorithm when compared with the NN trained by the SPSO algorithm and the PSOd_CV algorithm concerning the minimum learning error and the recognition rates.

References

5. R. Rojas, Neural networks - a systematic introduction, Springer-Verlag, 1996
15. T. L. Dang, Y. Hoshino, Hardware/Software Co-design for a Neural Network Trained by Particle Swarm Optimization Algorithm, Neural Processing Letters, pp. 1-25, 2018

**Index Terms**

Computer Science  
Algorithms

**Keywords**

Neural network, Particle swarm optimization, FPGA, ARM, codesign architecture