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
February 2019


Index Terms

Computer Science

Algorithms

Keywords

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