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

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Index Terms

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