Data Pre-processing for a Neural Network Trained by an Improved Particle Swarm Optimization Algorithm

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Abstract

This paper proposes an improved version of particle swarm optimization (PSO) algorithm for the training of a neural network (NN). An architecture for the NN trained by PSO (standard PSO, improved PSO) is also introduced. This architecture has a data preprocessing mechanism which consists of a normalization module and a data-shuffling module. Experimental results showed that the NN trained by improved PSO (IPSO) achieved better performance than both the NN trained by standard PSO and the NN trained by back-propagation (BP) algorithm. The effectiveness concerning the recognition rate and the minimum learning error of the data preprocessing modules (normalization module, data-shuffling module) was also demonstrated through the experiments.

References

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Index Terms

Computer Science Algorithms
Keywords

Normalization, Data shuffling, Neural network, Particle swarm optimization, C language