Deterministic Self-Organizing Neural Networks for Multi-Dimensional Problems

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When a neural network is used to solve a given problem, it is necessary to match the complexity of the network to that of the problem. The complexity of the network significantly affects its learning capability and generalization performance. Thus, it is desirable to have an algorithm that can find appropriate network structures in a self-organizing way. However, the self-organizing algorithms that were previously developed have randomness which may give a good solution but also may give a bad solution.

Utilizing both the construction and the pruning, the proposed algorithm finds a near-optimal network which is compact and shows good generalization performance. One of its important features is the deterministic feature, which means the randomness of neural networks is effectively eliminated. So this algorithm always matches the complexity of the network to that of the problem very well.

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