Immune and Neural Network Models: Theoretical and Empirical Comparisons

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Abstract

This paper brings a detailed mathematical description of an artificial immune network model, named aiNet. The model is implemented in association with graph concepts and hierarchical clustering techniques, and is proposed to perform machine learning, data compression and cluster analysis. Pictorial representations for the aiNet basic units and typical architectures are introduced. The proposed immune network was primarily compared on a theoretical basis with well-known artificial neural networks. Then, the aiNet was applied to a non-linearly separable benchmark and a real-world problem, and the results were compared with that of the self-organizing feature map and those already presented in the literature.