

研究、探讨

## 基于跨越连接的多层前馈神经网络结构分析

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**摘要** 任何连接方式的神经网络总可以归结为跨越连接网络。在传统多层前馈神经网络算法的基础上, 提出了完全连接神经网络的概念, 给出了基于跨越连接的多层前馈神经网络算法。通过分析多层前馈神经网络的误差函数, 从理论上证明了: 相对于无跨越连接网络, 基于跨越连接的多层前馈神经网络能以更加简洁的结构逼近理想状态。最后, 用一个隐层神经元解决了XOR问题。

**关键词** [跨越连接](#) [多层前馈神经网络](#) [隐层结构](#) [XOR问题](#)

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## Research on structure of multi-layer feed-forward neural network with cross connections

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### Abstract

Neural networks with any kind of connections can always be sorted as cross-connected ones. According to traditional multi-layer feed-forward neural network, this paper elaborates the concept of completely-fully connected neural network and then puts forward a cross-connected multi-layer feed-forward neural network algorithm. By analyzing the error function of multi-layer feed-forward neural network, it can be theoretical proved that the cross-connected neural network can reach ideal results with more concise framework compared with the non-cross connected neural network. Lastly, the proposed algorithm is tested on the XOR problem, which is well solved by using only one hidden neuron.

**Key words** [cross connections](#) [multi-layer feed-forward neural network](#) [structure of hidden layer](#) [XOR problem](#)

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