

网络、通信与安全

## 计算机网络安全综合评价的神经网络模型

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**摘要** 灰色评价法、模糊综合评价等需确定隶属函数、各指标权重,明显受人为因素的影响。尝试应用神经网络技术进行网络安全的综合评价,并通过在单指标评价标准范围内随机取值方法,生成建立神经网络模型所需的训练样本、检验样本和测试样本,在遵循BP网络建模基本原则和步骤的情况下,建立了可靠、有效的网络安全综合评价模型。16个实例研究表明:提出的样本生成方法、建模过程是可靠的,并能有效地避免出现“过训练”和“过拟合”现象,建立的BP模型具有较好的泛化能力,不受人为因素的影响,各评价指标与网络安全等级之间存在明显的非线性关系,网络安全策略对网络安全的影响最大。

**关键词** [网络安全](#) [综合评价](#) [神经网络](#) [样本数据](#) [模型](#)

分类号

## Comprehensive evaluation model for computer network security applying artificial neural network

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### Abstract

Traditional methods such as grey evaluation model and fuzzy theory,determining the subordinate function and weights for each index,are influenced by personal factors.Artificial Neural Network (ANN) is then applied to network security comprehensive evaluation.The training set data,verification set data and testing set data,in agreement with the singular-evaluation index criterion,is randomly generated.The ANN-based model with reliability,effectiveness and comparative for network security is established obeying to the basic principles and steps for establishing ANN-model.The case study shows that the methodology for generating set data and the process for establishing ANN-model are effective and reliable.The phenomenon such as over-training and over-fitting can be effectively escaped and the established model possesses good generalization.The relationship between the network security and the evaluation index is nonlinear and the most important index is network security strategy.

**Key words** [network security](#) [comprehensive evaluation](#) [Artificial Neural Network \(ANN\)](#) [set data](#) [model](#)

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