因子分析和支持向量机的信息系统风险评价

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摘 要:风险评价是信息系统管理中的关建技术,针对信息系统风险的影响因子多、小样本、时变性等特点,以提高风险评价的精度为目标,提出一种因子分析法和支持向量机的信息系统风险评价模型(FA-CS-SVM).首先采用因子分析法对风险指标体系进行处理,提取公共指标,消除指标之间相关性,然后将公共指标作为支持向量机的输入向量进行训练,并采用布谷鸟搜索算法寻找最合理机参数,构建信息系统风险评价模型,最后利用仿真实例验证其可行性和合理性.结果表明,FA-CS-SVM提高了信息系统风险评价的精度,评价结果可以为信息系统管理员进行风险管理提供科学的参考依据.

关键词:因子分析;神经网络;信息系统;风险分析
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Risk Analysis of the Information System by Using Factor Analysis and Support Vector Machine

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Abstract: Risk assessment is the key technology in information system management. In view of the risk factors characteristics of small sample, time variability, etc., a risk assessment method (FA-CS-SVM) for the information system by using factor analysis and improved support vector machine is proposed to improve the accuracy of risk assessment. Firstly, factor analysis method is used to deal with the risk index system to extract the public index system and eliminate the correlation among the indexes, and secondly public indexes are used as input vector of support vector machine for training which cuckoo search algorithm is used to find the most reasonable parameters for support vector machine, and the risk evaluation model of information system is constructed, and the feasibility and rationality of the model is verified in the end. The results show that FA-CS-SVM can improve the accuracy of the information system risk evaluation, and the evaluation results can provide scientific reference for the management of information system.

Key words: factor analysis; neural network; information system; risk analysis

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