神经网络和自适应差分进化在云计算的应用研究

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摘　要：近年来，云计算的出现极大地改变了现有的计算方法.尽管云计算有诸多优点，但同样面临着一些挑战.云计算面临的主要挑战包括动态资源缩放和功耗，这些因素导致云系统变得低效且昂贵.工作载荷预测是云效率和运行成本得以改善的变量之一.准确性是工作载荷预测的关键组成部分.在前人研究的基础上，本文提出了一种基于神经网络和自适应差分进化算法的负荷预测模型，该模型能够学习最优的变异策略以及最优交叉率.最终，和反向传播学习算法模型的预测结果进行比较，证明了所提模型的有效性.

关键词：神经网络；自适应差分进化；云计算；载荷预测

Research on Application of Cloud Computing with Using Artificial Neural Network and Adaptive Differential Evolution

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Abstract：Cloud computing has drastically transformed the means of computing in recent years. In spite of numerous benefits, it suffers from some challenges too. Major challenges of cloud computing include dynamic resource scaling and power consumption. These factors lead a cloud system to become inefficient and costly. The workload prediction is one of the variables by which the efficiency and operational cost of a cloud can be improved. Accuracy is the key component in workload prediction. On the basis of previous studies, this paper is presented a workload prediction model using neural network and adaptive differential evolution algorithm. The model is capable of learning the best suitable mutation strategy along with optimal crossover rate. Finally, we compared the results with prediction model based on back propagation learning algorithm and proves the effectiveness of the proposed model.

Key words：neural network; adaptive differential evolution; cloud computing; workload predict

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