RESEARCH ON SUPPLY CHAIN DEMAND PREDICTION BASED ON BP NEURAL NETWORK ALGORITHM

Abstract: Demand prediction is a hot research field in markets management, especially for fresh agricultural products prediction based on supply chain management. Based on BP neural network, a new demand prediction algorithm for fresh agricultural products is presented in the paper. First, the structure and data indicators of BP neural network algorithm are redesigned and the training function is selected for the fresh agricultural products prediction algorithm. Second, the improvement of excitation function, (including trigonometric function and sigmoid function) and orthogonalizable design, are presented and analyzed to speed up the calculation and improve the prediction accuracy of ordinary BP algorithm. Finally, data from certain fresh agricultural product corporations are taken for example and the simulation results show that not only the problem of convergence speed has been solved, but also the prediction accuracy is ensured when the improved algorithm is used in demand prediction for fresh agricultural products.

Keywords: supply chain management, demand prediction, BP neural network algorithm, fresh agricultural products.

Abstract: 需求预测是市场管理（尤其是农产品的供应链管理）的研究热点之一，本文在改进 BP 神经网络的基础上，提出了一个新的农产品供应链需求预测模型。首先，本文为农产品供应链需求预测模型设计了 BP 神经网络模型的网络结构、数据指标和训练函数；其次，通过改进 BP 神经网络的激励函数（包括三角函数和 sigmoid 函数）和正交化设计优化了算法的运算效率，收敛速度和需求预测的精度；最后选用某农产品供应链的数据为例进行了实验仿真预测，实验结果表明，本算法不仅解决 BP 神经网络在供应链需求预测时的收敛速度问题，也提高了预测精度。

关键词: 供应链管理，需求预测，BP 神经网络，农产品。