

工程与应用

集成智能自适应货运量预测算法研究

于少伟

山东英才学院 商学院, 济南 250104

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摘要 在深入分析各种货运量预测模型的基础上, 首先提出了基于云理论的新的不确定性推理模型——T-S-C-Y模型; 然后基于灰色关联理论对货运量及其相关因素进行了灰关联分析, 并确定影响货运量诸多因素的灰关联序; 在此基础上结合一维T-S-C-Y模型和径向基函数神经网络建立了货运量预测模型对河南省1997~2002年的货运量进行预测。该预测模型既能很好地集成概念的模糊性和随机性, 同时又具有自学习、自组织、自适应和强的容错能力, 而且预测输出结果为置信区间值, 能够很好地适应货运量的高度不确定性。结果表明模型的预测值基本上与实际值吻合, 是一更加科学、合理的预测模型。

关键词 [一维T-S-C-Y模型](#) [云理论](#) [货运量](#) [径向基函数 \(RBF\)](#) [神经网络](#)

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Integrated intelligent and adaptive algorithm for freight transportation prediction

YU Shao-wei

Business School, Shandong Yingcai University, Jinan 250104, China

Abstract

A new uncertainty reasoning model based on cloud theory is firstly proposed after deeply analyzing the various freight transportation forecasting model, and then the relationship between freight transportation and related factors and the grey order of factors affecting freight transportation are analyzed and determined based on the theory of grey correlation. In addition, the freight transportation of Henan during 1997~2002 is predicted by a model based on one-dimension T-S-C-Y model and RBF neural network. The forecast model can not only integrate the fuzziness and randomness of a linguistic concept but also has the capacities of self-learning, self-organization, adaptation and strong fault-tolerant, and the output of the prediction model is the confidence interval which can well adapt the highly uncertain change of the freight transportation. The simulation results show that the outputs of T-S-C-Y model are in accord with the real ones, and the prediction model is more scientific and rational.

Key words [one-dimension T-S-C-Y model](#) [cloud theory](#) [freight transportation](#) [Radial Basis Function \(RBF\)](#) [neural network](#)

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通讯作者 于少伟 yushaowei0505@126.com

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