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# A NETWORK TRAFFIC HYBRID PREDICTION MODEL OPTIMIZED BY IMPROVED HARMONY SEARCH ALGORITHM

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**Abstract:** The telecommunication and Ethernet traffic prediction problem is studied. Network traffic prediction is an important problem of telecommunication and Ethernet congestion control and network management. In order to improve network traffic prediction accuracy, a network traffic hybrid prediction model was proposed by using the advantages of grey model and Elman neural network, grey model and Elman neural network predictive values were independently obtained, the different weight coefficients of two prediction models were given. In terms of weight coefficients optimization, an improved harmony search algorithm with better convergence speed and accuracy was proposed, the optimal weight coefficients of network traffic hybrid prediction model were determined through this algorithm, two prediction models results were multiplied by the weight coefficients to obtain the final prediction value. The network traffic sample data from an actual telecommunication network was collected as simulation object. The simulation results verified that the proposed network traffic hybrid prediction model based on improved harmony search algorithm has higher prediction accuracy.

Key words: *network traffic, grey model, Elman neural network, prediction, improved harmony search*

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## 1. Introduction

The telecommunication or Ethernet network traffic is an important parameter of the network management. During designing a telecommunication or Ethernet network congestion control strategy for the case that network source is limited, an accurate network traffic prediction is very important for reducing network congestion, reasonably allocating network resource, improving the service quality of the network and finding abnormal network behavior [1, 12].

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