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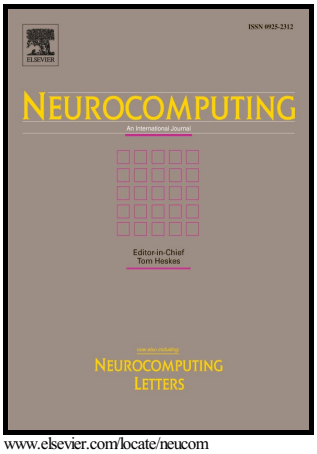

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An Improved Gravitational Search Algorithm for Green Partner Selection in Virtual Enterprises

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With the increasing public consciousness in environmental protection, the green partner selection problem (G-PSP) is an important issue in virtual enterprises. In this paper, the green criterion is introduced to partner selection problem (PSP), and a green partner selection model based on six criteria is proposed. As PSP has been proven to be an NP problem, and G-PSP cannot be solved in reasonable time by traditional methods. In this paper, an improved algorithm I-GSA/PSO that combines gravitational search algorithm and particle swarm optimization is developed to solve G-PSP in virtual enterprises. Experimental results show that I-GSA/PSO is effective and outperforms other evolutionary algorithms in solving G-PSP.

Keywords: Gravitational search algorithm; Particle swarm optimization; Green partner selection; Virtual enterprise

1. Introduction

With the rapid development of internet, information technology and economic globalization, competition in the global market becomes increasingly fierce. Some small and medium-sized enterprises realize that they are not competitive only by their own finite capacity; as a result, they begin to seek the cooperation and take a collectivized approach to satisfy the dynamic changing requirements of customers and enhance the market competitiveness [1, 2]. The concept of a virtual enterprise as an effective organizational mode was first proposed by Preiss in 1991 [3]. VE is a temporary alliance that consists of some diverse, autonomous, or geographically dispersed

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