Review

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Neural Network Optimization for Energy-Optimal Cooperative Computing In Wireless Communication System

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Abstract **–Thanks to the rapidly development of optimization algorithm, more energy can be saved in the communication system when executing an application. In recent years, allocating limited resources in a cooperative manner to maximize energy efficiency in emerging sensor networks has attracted a lot of attention. In this paper, a one-layer projection neural network subject to linear equalities and bound constraints is introduced and applied in mobile wireless sensor network to make it energy-efficient by reasonably allocating local and remote data sizes when processing an application within a certain period of time. Firstly, an optimal partition to minimize the total energy consumption of the local and helper sensor nodes is proposed. Then, the neural network model is descripted and the optimality and convergence of the proposed model are analyzed. Finally, some simulation results are given to show that the proposed algorithm is very effective to solve the energy efficient cooperative computing.**

Keywords--**Cooperative, energy efficient, mobile wireless sensor network, projection neural network**

1. INTRODUCTION

Realizing efficiency in terms of energy is one of the most important parts in communication system. So, finding an effective arithmetic to help the system computing has caused a great attention. With the development of embedded systems, wireless communication technology and micro-sensing technology, wireless sensor networks in the civilian and military fields get a wide range of application in recent years. For example: environmental monitoring, object tracking, forest fire, battlefield situation monitoring and so on. The sensor network is composed of many smaller, energy-limited sensor nodes which have the capabilities of computation and wireless communication. After the node is placed in the corresponding position, the detected information will be transmitted to the distant base station in a multi-hop transmission mode through wireless communication. In the sensor network, the nodes generally are powered by battery, while their energy is limited, in some harsh environmental conditions, the replacement of the battery or charging for the node is not feasible. Thus, how to maximize energy savings and extend network life are key issues in sensor networks [1].

Cooperating with each other to complete the specified task is one of the effective ways for sensor nodes to save energy and obtain high performance. In [2], in order to estimate the position of the target, multiple nodes were combined to complete computationally intensive tasks which the computational

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