Abstract

This paper presents the design of intelligent distributed nodes to predict the chloride concentration of the water samples in neural network environment using PIC18F452 microcontrollers. The nodes are arranged as a coordinate node and four sensor nodes. The training phase of neural network is implemented on coordinate node using Back Propagation Algorithm. The physical parameters of temperature and conductivity of water samples are taken as input parameters and chloride concentration as output parameter for the training phase. The knowledge acquired in the form of weights is stored into all sensor nodes and they are concurrently act as sensing points to predict the chloride concentration by measuring temperature and conductivity using sensors in testing phase. The performance of this scalable system is evaluated using accuracy, speedup and efficiency. The result shows that system attained the linear speed up in analysis of water samples.
Distributed Chloride Prediction System Using Neural Network and PIC18F452 Microcontrollers in Water Analysis

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Index Terms

Computer Science

Parallel Computing

Key words

Distributed System

Artificial Neural Network
Back Propagation Training

Chloride Concentration

Microcontroller