PARTICLE SWARM OPTIMIZATION TRAINED NEURAL NETWORK FOR MEDICAL DIAGNOSIS

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ABSTRACT

Multilayer Perceptron Neural Networks trained using Particle Swam Optimization (PSO) used for disease classification is utilized in this research. Experiments were conducted using dataset for acute diseases obtained from Mindanao State University-Iligan Institute of Technology (MSU-IIT) clinic and dataset for thyroid diseases from the UCI Machine Learning Data Repository as first and second dataset respectively. The data gathered from MSU-IIT clinic were normalized, disregarding repetitive data choosing only the most frequently occurring illness: Upper Respiratory Tract Infection (URTI), Systematic Viral Infection (SVI), and Acute Tonsillitis. The file from UCI Machine learning Data Repository consist of 5 attributes and 3 classes of diagnosis concerning thyroid diseases classification cases. There are 215 data samples in which 150 of it is used for training the network and the remaining 65 is for testing the network. The network trained with PSO can correctly classify diseases more than 90% of the time on the first dataset and more than 80% on the second dataset in greater than 600 and less than 1000 iterations. Results show that PSO can successfully optimize the weights of a Neural Network and produce good classification performance.

Keywords: Artificial Neural Network, Multilayer Perceptron, Particle Swarm Optimization, Medical Diagnosis