IMPROVED VOTING TECHNIQUE FOR ENSEMBLE OF MLP SYSTEM APPLIED ON VARIOUS CLASSIFICATION DATA

INSTITUT PENGURUSAN PENYELIDIKAN
UNIVERSITI TEKNOLOGI MARA
40450 SHAH ALAM, SELANGOR
MALAYSIA

BY:

SAODAH OMAR

IZA SAZANITA ISA

ASS. PROF. DR JUNITA MOHD SALEH

MAY 2010

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ABSTRACT

An Artificial Neural Network (ANN) system has been extensively applied to numerous data classification problems such as cloud classification, business applications (sales forecasting), and medical domain for clinical diagnosis. The most well-known ANN architecture is the Multilayer Perceptron (MLP) network which is widely used for solving problems related to data classifications. However, the conventional ANN theory selects the best MLP (after training) for classification based on one which has the least number of hidden neurons, and gives the highest percentage of correct classification when if there are other MLPs (with more number of hidden neurons) which gives the same highest percentage of correct classification. The concept may not be correct since the other MLPs may perform better when presented with new datasets. Therefore, this project intends to investigate the capability of multiple MLP system with majority voting technique. It is a system which consists of all the best-performed MLPs and a single final output from these MLPs is selected by the voting system. The work employs MATLAB Neural Network Toolbox and Borland C++ programming language as the tools to develop the proposed system. The MLP networks are trained using two types of learning algorithm, which are the Levenberg Marquardt and the Resilient Back Propagation algorithms. The performance of the multiple MLP networks are calculated based on the percentage of correct classificition. Data from two case studies; triangular waveform classification and breast cancer detection, have been used to test the performance of the developed system. The results show that the multiple MLP system with voting technique had the capability to improve the classification correctness.