



A LOCALLY-TUNED MINIMAL RESOURCE ALLOCATION NETWORK FOR PATTERN CLASSIFICATION

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ABSTRACT—In this paper, the study of instability in Minimal Resource Allocation Network (MRAN) when presented with pattern classification is investigated and eliminated to a great extent. To tackle the instability problem in MRAN, an improved algorithm for pattern classification and approximation referred to as extended-MRAN (eMRAN) is introduced. In eMRAN, the ideas of localized adding criteria, localized Extended Kalman Filter (EKF), pruning strategy by class and monitoring of hidden neurons' parameters by class have been adopted. Two benchmarks and a simulated data have been utilized in verifying the classification performance of the improved network. The Probabilistic Neural Network (PNN) has also been introduced as a comparison tool since it has been a well-known superb classifier. From the simulation results obtained, eMRAN appeared to outperform the original MRAN and is also close to that of PNN if not better.

Key Words: Minimal resource allocation network (MRAN), probabilistic neural network (PNN), network instability, pattern classification, extended kalman filter (EKF).