

Assignment 2

(Neural Network and Fuzzy Logic Course)

1. The dataset (data5.mat) contains 72 features and the last column is the output (class labels). Design a **multilayer perceptron based neural network (two hidden layers)** for the classification. You can use both holdout and 5-fold cross-validation approaches for evaluating the performance of the classifier.
2. Implement the **radial basis function neural network (RBFNN)** for the classification problem. You can use Gaussian, multiquadric and linear kernel functions for the implementation. You can use both holdout and 5-fold cross-validation approaches for evaluating the performance of the classifier. Please use the dataset (data5.mat).
3. Implement the **stacked autoencoder based deep neural network** for the classification problem. The deep neural network must contain 3 hidden layers from three autoencoders. You can use data5.mat file and either holdout or 5-fold cross-validation technique for selecting, training and test instances for the classifier. For autoencoder implementation, please use back propagation algorithm which has been already taught in the class.
4. Implement extreme learning machine (ELM) classifier for the classification. You can use Gaussian and tanh activation functions. Please select the training and test instances using 5-fold cross-validation technique. Please use the dataset as data5.mat.
5. Implement a deep neural network, which contains **two hidden layers (the hidden layers are obtained from the autoencoders)**. **The last layer will be the ELM layer** which means the second hidden layer feature vector is used as input to the ELM classifier. The network can be called as deep layer stacked autoencoder based extreme learning machine. You can use holdout approach for evaluating the performance of the classifier. Please use the dataset (data5.mat).