Evaluate classifier performance through leave one out cross validation

Set aside one example as a test fold for evaluating classifier accuracy

Scale data: for each feature compute the mean and standard deviation across the training samples (n-1 examples) and use to scale all examples

Carry out leave one out cross validation to select classifier parameters: the soft margin $C$ and number of feature families (ROI/graph)

- Set aside one example as a test fold for evaluating classifier accuracy
- Rank features according to their between group $t^2$ statistic as derived from the training set (n-2 examples) to leave the top 25% features in each family (ROI/graph)
- Evaluate SVM performance on training sample over all the range of classifier parameters
  - Compute the optimal weighted sum of feature kernels using block diagonal optimization and train SVM and evaluate on test sample
  - Use the learned weights to remove the feature family with the least contribution
- Compute accuracy over the n-1 training folds for every conjunction of $C = c_{opt}$ and $\text{FeatNum} = k$

Choose $C = c_{opt}$ and $\text{FeatNum}_{opt} = [k_1 \ldots k_m]$ that attained maximal accuracy

Rank features according to their between group $t^2$ statistic as derived from the training set (n-1 examples) to leave the top 25% features in each family

For all feature families

- Compute the optimal weighted sum of feature kernels using block diagonal optimization
- Train SVM and remove least contributing feature family
- Evaluate SVM with $c_{opt}$ and $\text{FeatNum}_{opt} = [k_1 \ldots km]$ on withheld subject establishing correctness through a (binary) majority vote

Establish feature accuracy across the $n$ training folds, as well as the average feature family ranking.