Applying machine learning EEG signal classification to emotion related brain anticipatory activity

Classification performance of three different classifiers:

* Linear discriminant analysis
* Support Vector machine
* K-nearest neighbors

Talks also of the radial basis function (RBF) kernel.

Using spectral and temporal features.

Also contrasted the classifiers’ performance with static and dynamic (time evolving) features.

Emotion can be defined in terms of 3 different attributes:

* Valence, measure the positiveness (unpleasant to pleasant)
* Arousal, measure the activation level (boredom to frantic excitement)
* Dominance, measure the controllability

Along with performance, use Kappa statistic for performance measure.

Dynamic classifiers:

Temporal features are fed into either “dynamic” classifiers, such as the Hidden Markow Model (HMM).

Identify the best classifier (static vs dynamic) and the best feature type (spectral vs temporal) to classify the arousal level (high vs low).

Number of groups (4), number of classifiers (3), number of feature types (2), each classification (static or dynamic) produced a total of 24 accuracies.

Results show that globally SVM presents the best accuracy, independent from feature type (temporal or spectral). Combination of SVM with the dynamic temporal feature produced the best classification performance.