**A machine learning approach on individual specific task configuration**

To evaluate whether functional connectivity networks of a single subject yield consistent individual versus task specific qualities we applied several machine learning approaches to the Midnight Scan Club dataset.

To test whether patterns in functional connectivity could be used to predict task from rest

The main question was to determine how well a machine learning algorithm could classify task versus resting state scans across 9 highly sampled individuals from the MSC who participated in 10 fMRI sessions. Using the edges of functional connectivity matrices for each subjects task and rest scans. The first aim of this study was to determine if stable individual specific qualities of FC could reliably predict task from rest within subject. The second aim of the study was to determine how generalizable FC matrices of task and rest could be used to predict across subjects. We applied a support vector machine with cross validation and a logistic regression model with cross validation to determine classification accuracy. Our results suggest that both models were able to classify task states within subjects greater than above chance. The logistic regression model had higher accuracy for classifying task states within subject between tasks compared to SVM. For both models it would appear that the model was unable to classify task state when trained using the motor task FC. Lastly both classifiers were able to classify task and rest states when trained along one subject and tested along a different subject greater than above chance.

The classifier does much better at predicting labels of within individual within task compared to any of the other analysis done.