Different neuropsychiatric disorders have overlapping symptoms and often also overlapping neural circuits. Diagnostic criteria are able to differentiate between them, but sometimes there are some impairments about the spectrum of symptoms and the categorization into mild to severe, that could be enhanced using neuroimaging-based diagnostic classification and biomarkers to make subgroups.

A good approach is to apply supervised classification methods on functional connectivity features obtained from fMRI to identify brain-based disorders. Most of the studies use a priori clinical diagnosis to guide classification and target only one specific illness.

The authors want to explore the unsupervised methods, such as clustering, to identify neuropsychiatric disorders. They use methods that don’t require a priori specification of the number of clusters, adding also feature selection algorithms due to the high dimensionality of the feature space.

PIPELINE  
ADHD, AD, and ASD data is obtained from publicly available databases. PTSD study was carried out by the researchers.

FOR ADHD:

* 487 subjects selected from the ADHD-200 datset (ADHD-H subject were ignored)

FOR ASD

* 454 subjects