Classifying Psychiatric Disorders
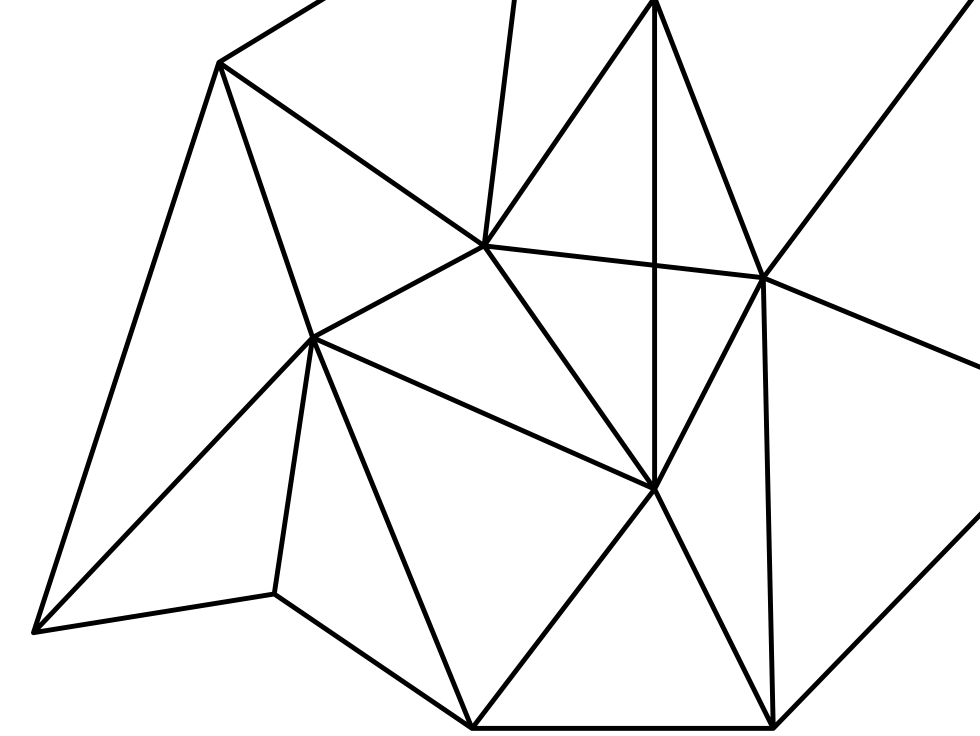
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Manfred Gónzalez,
Ahmet Çalış

Index

- The problem with traditional diagnosis
- The Data
- Disease status
- Disorder Segmentation
- Latent Space

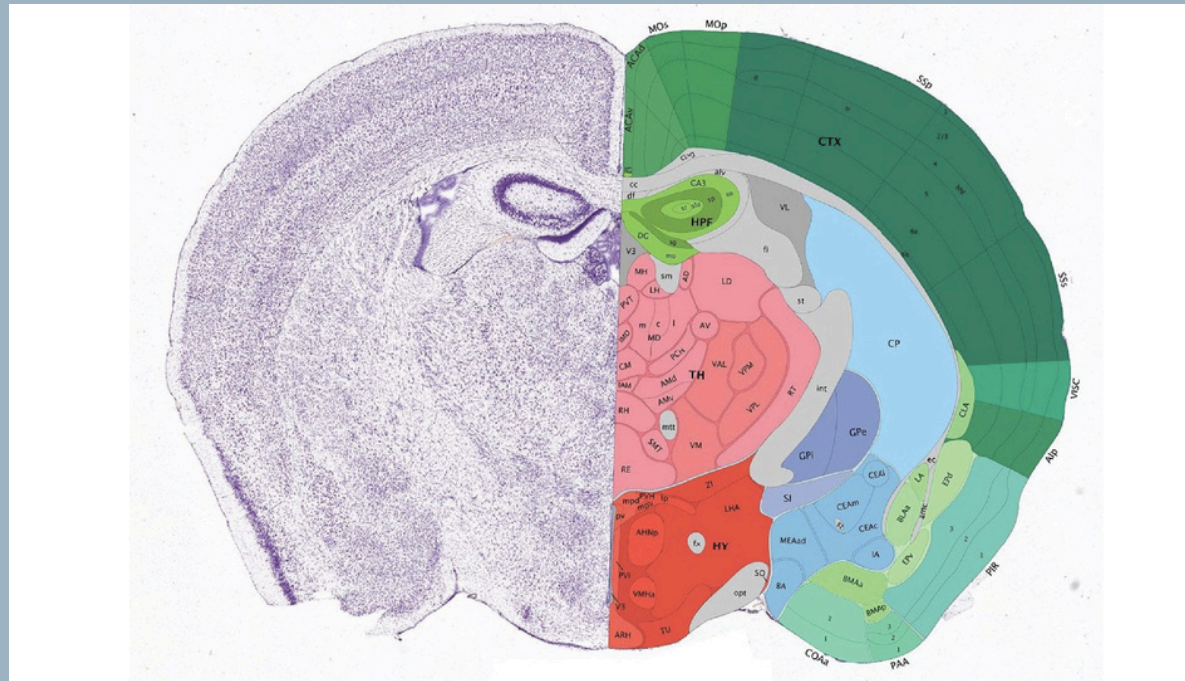# The traditional approach

Self-reported

Using PANSS scores

Behavior based
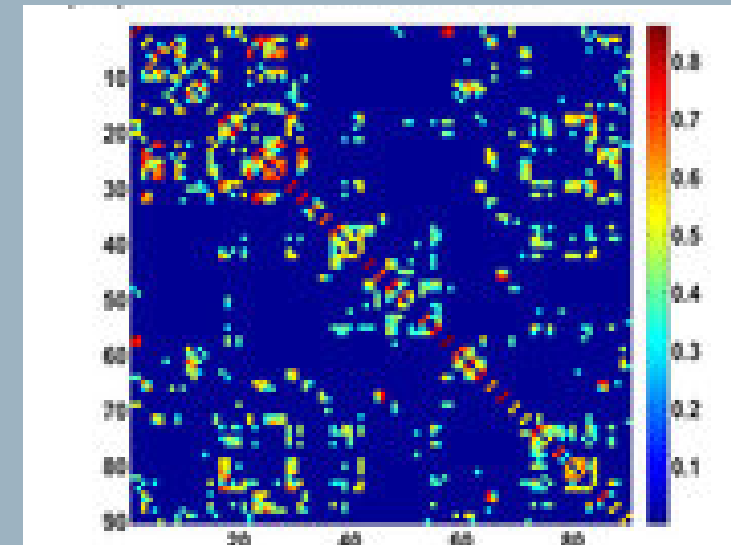
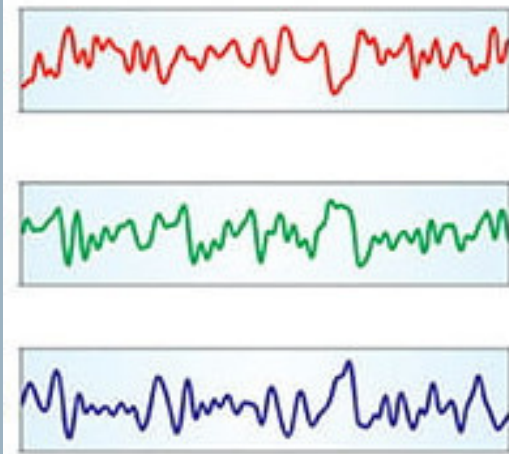Evaluates the patients behavior and state of mind

Diagnosis Protocol
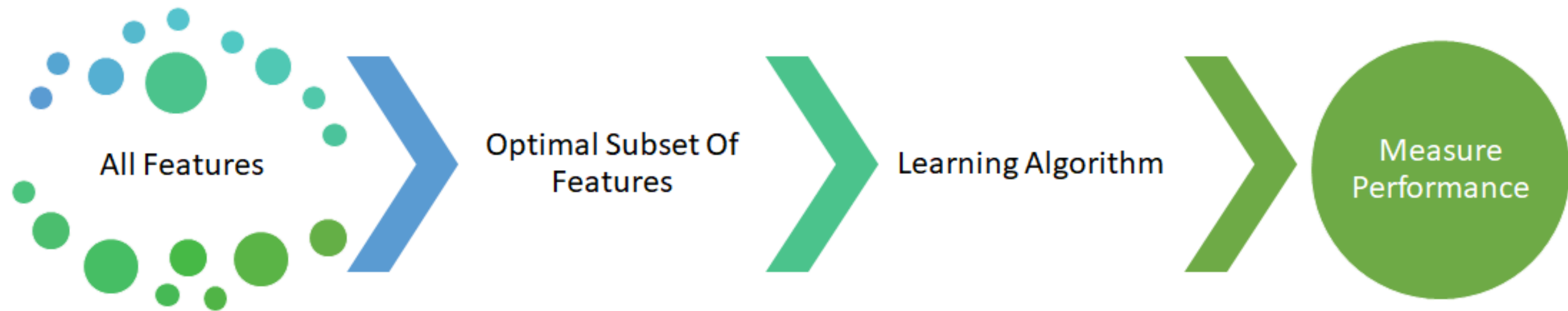
Self reported and innacurate.
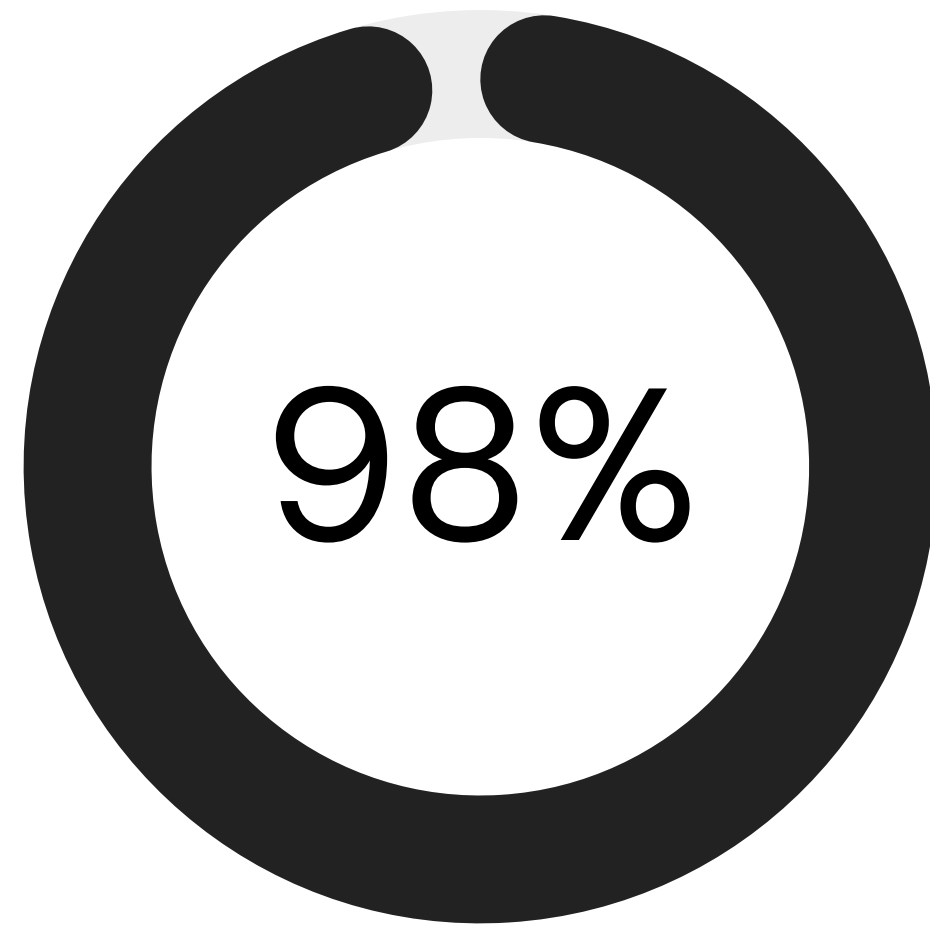
The Data Pipeline

Time course extraction

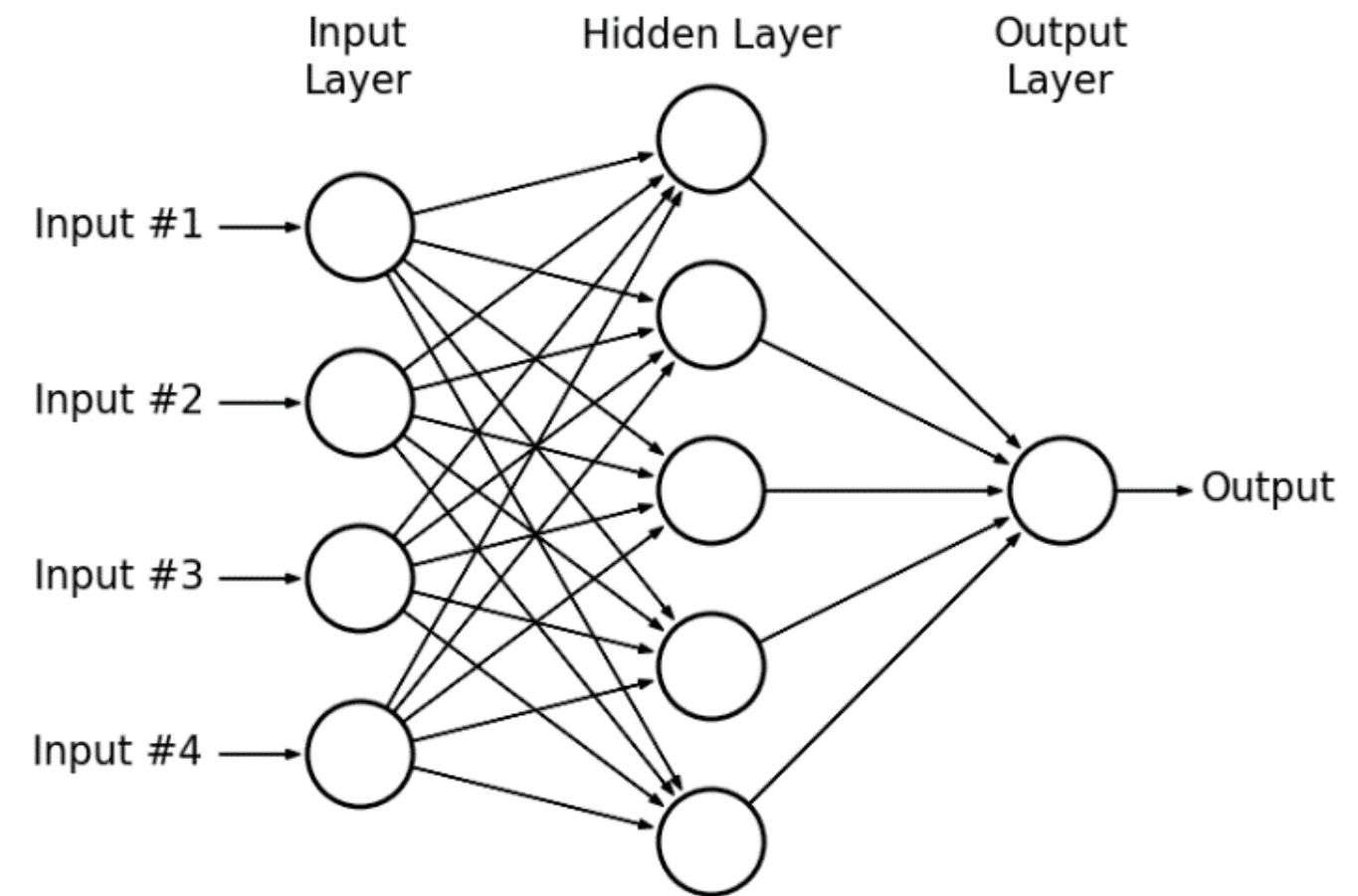$$\begin{bmatrix} k_1 \\ k_2 \\ \vdots \\ k_n \end{bmatrix}$$

Feature Selection

All Features

Optimal Subset Of Features

Learning Algorithm

Measure Performance
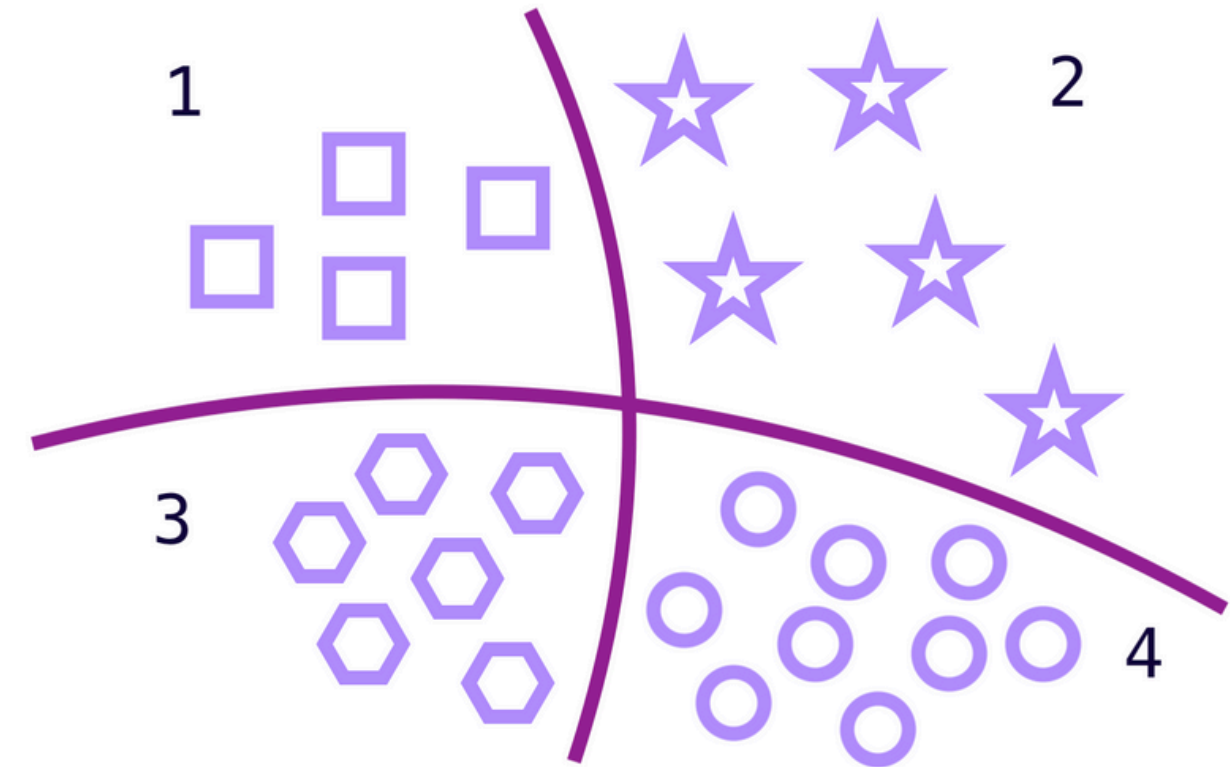
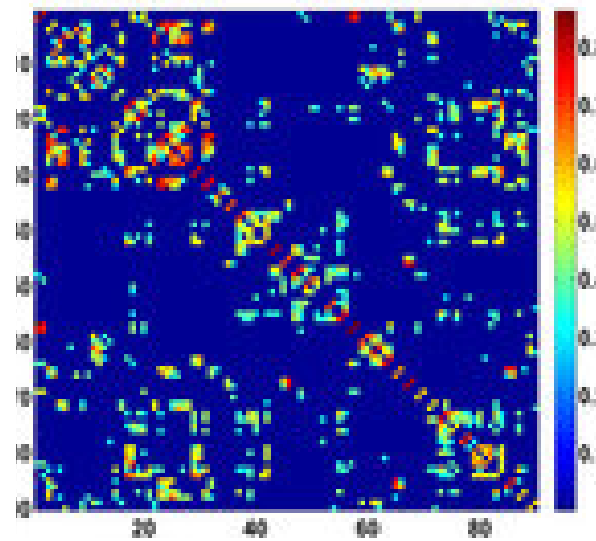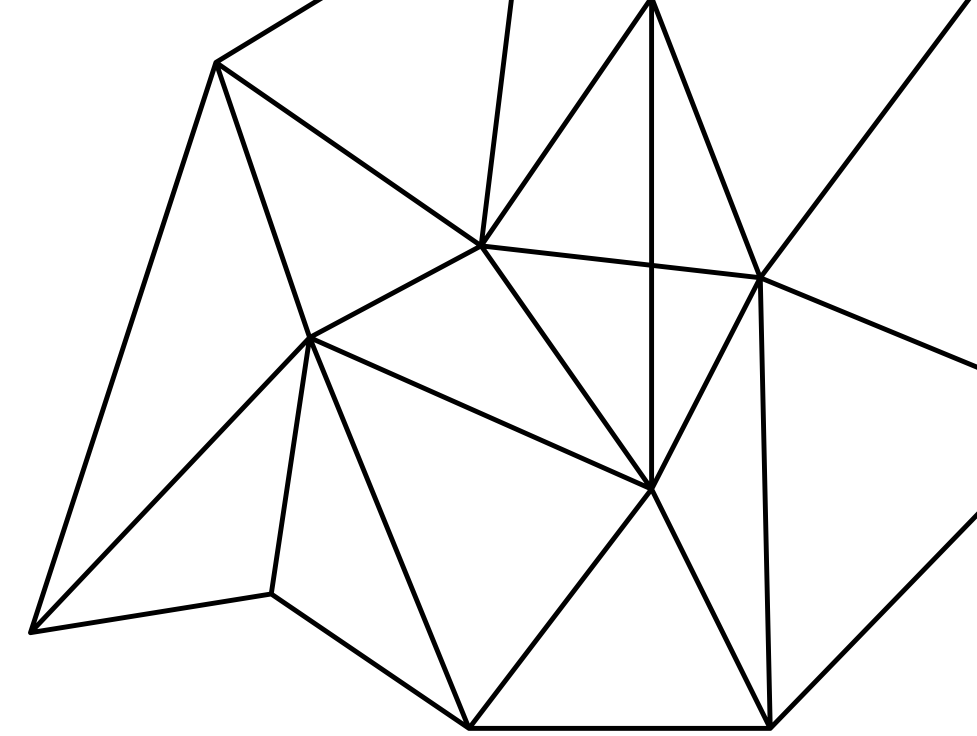# Disease Status Classification
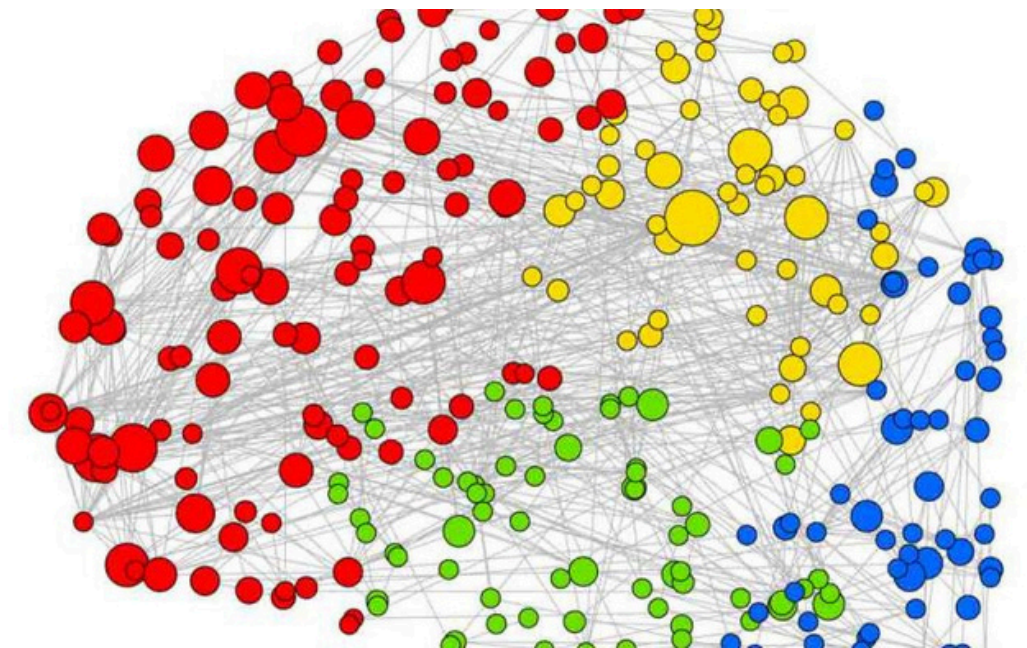
98%

XGBoost

# Disorder Classification
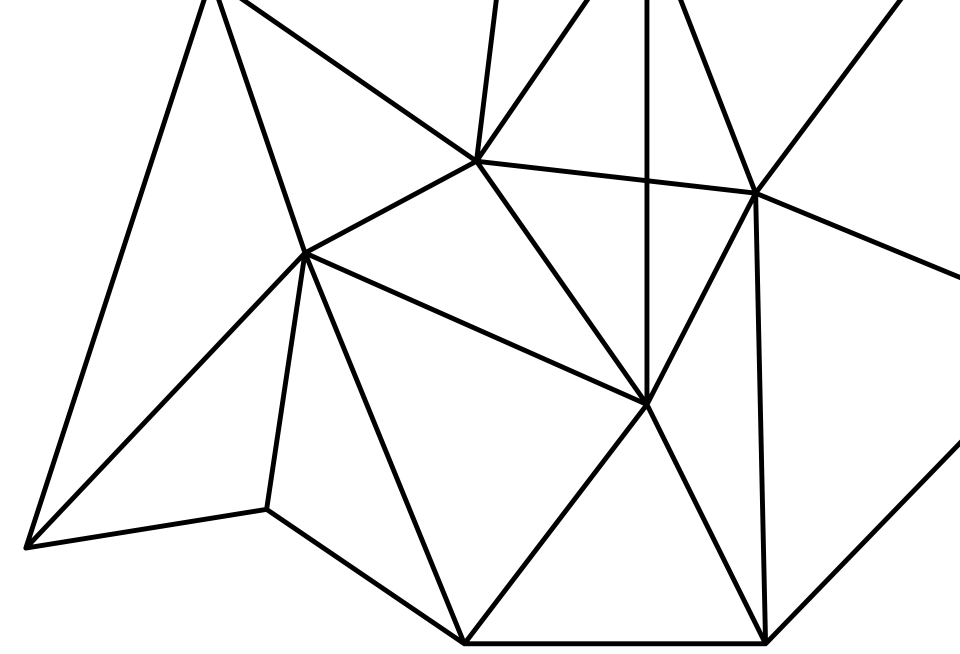

57%

Network Analysis


KNN Filter

STD Filter

Network Analysis

STD = 2

Statistic	BPP	CON	SADP	SCZP
m	82137	78250	78832	84185
$\langle K \rangle$	228.79	217.97	219.59	234.50
$\langle C \rangle$	0.55	0.55	0.54	0.56
$\langle PL \rangle$	1.69	1.71	1.70	1.68
CC	717.83	717.88	717.84	717.89

STD = 4.5

label	BPP	CON	SADP	SCZP
m	5083.51	1672.45	2622.66	8815.35
$\langle K \rangle$	14.16	4.66	7.31	24.56
$\langle C \rangle$	0.11	0.09	0.09	0.12
$\langle PL \rangle$	4.31	4.00	4.11	4.36
CC	146.41	118.44	147.94	156.89

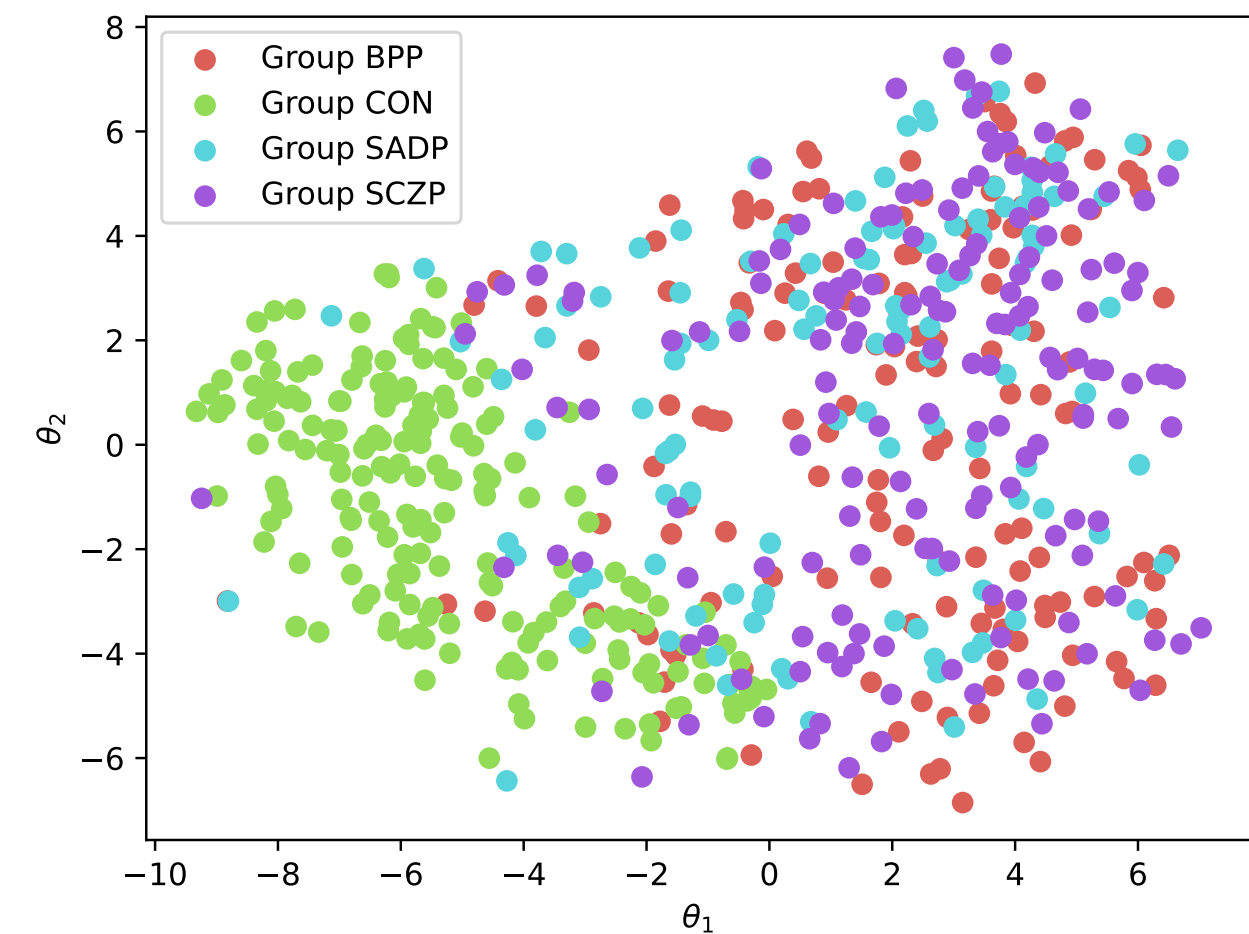Arithmetic Agreement Heatmap (4.2 - 4)
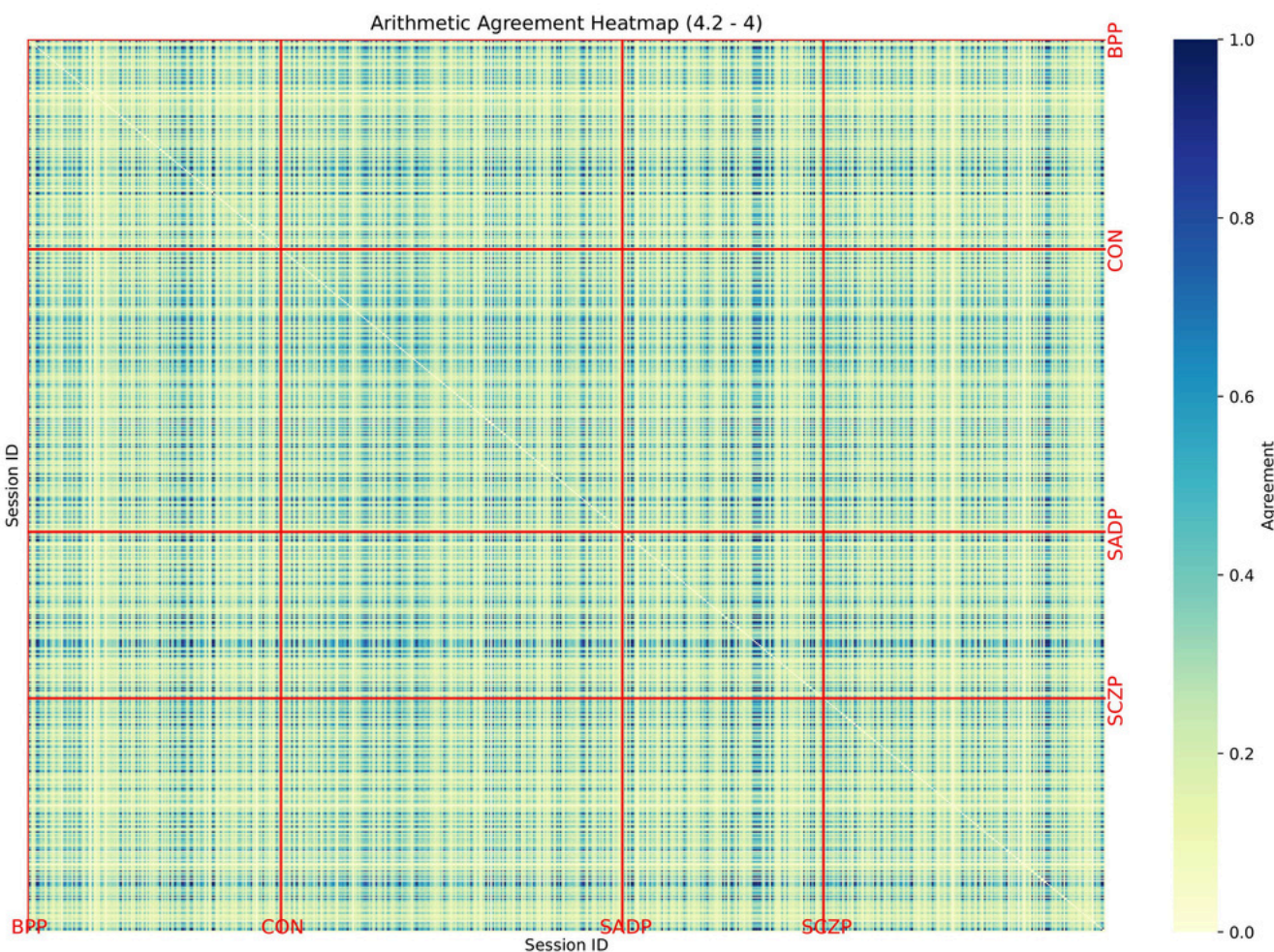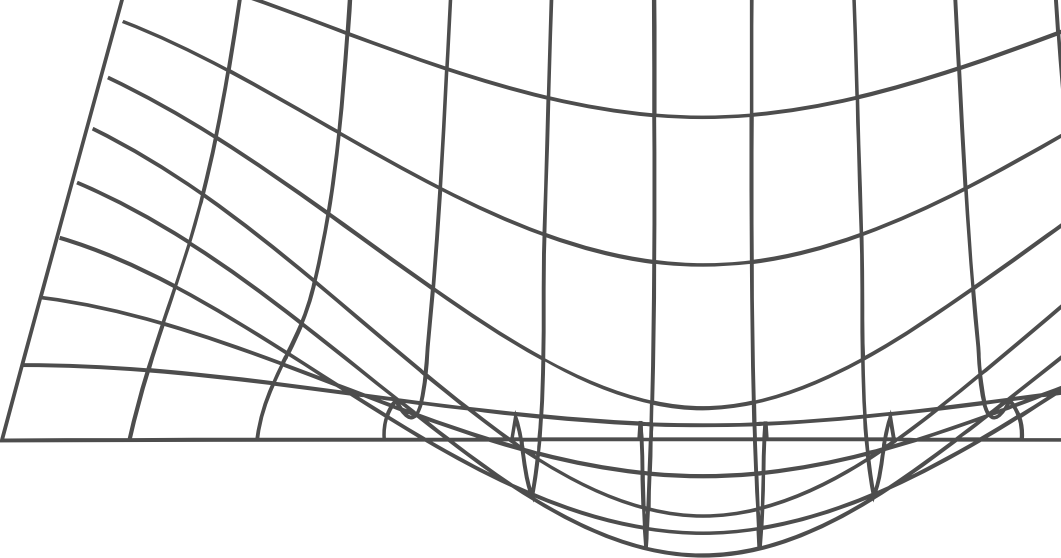
Latent Space Representation
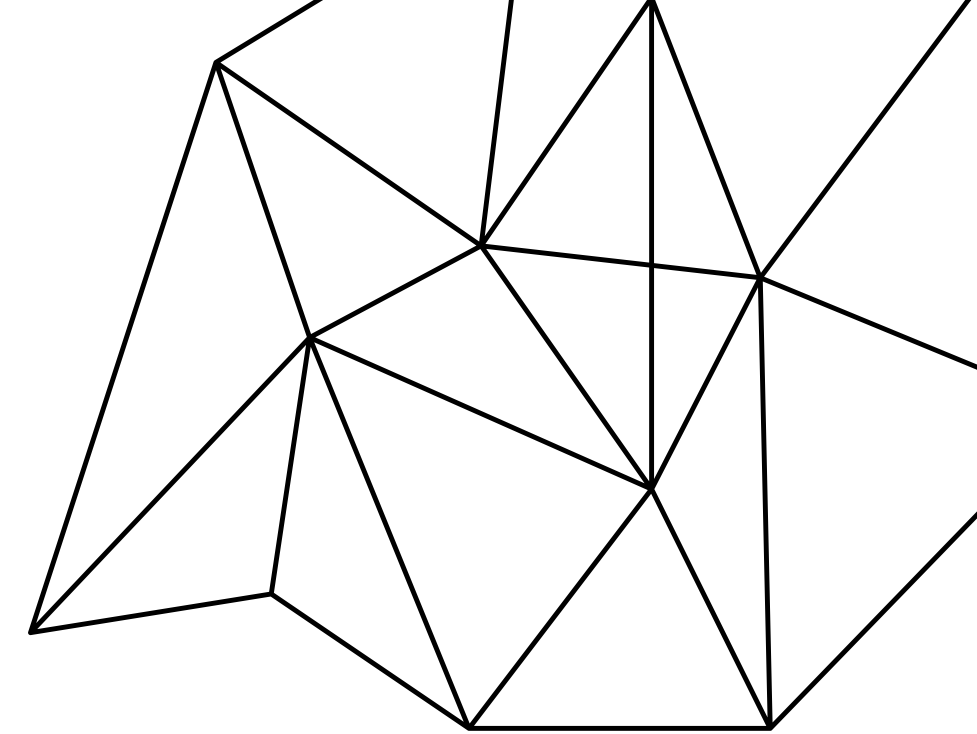
DNN Embedding
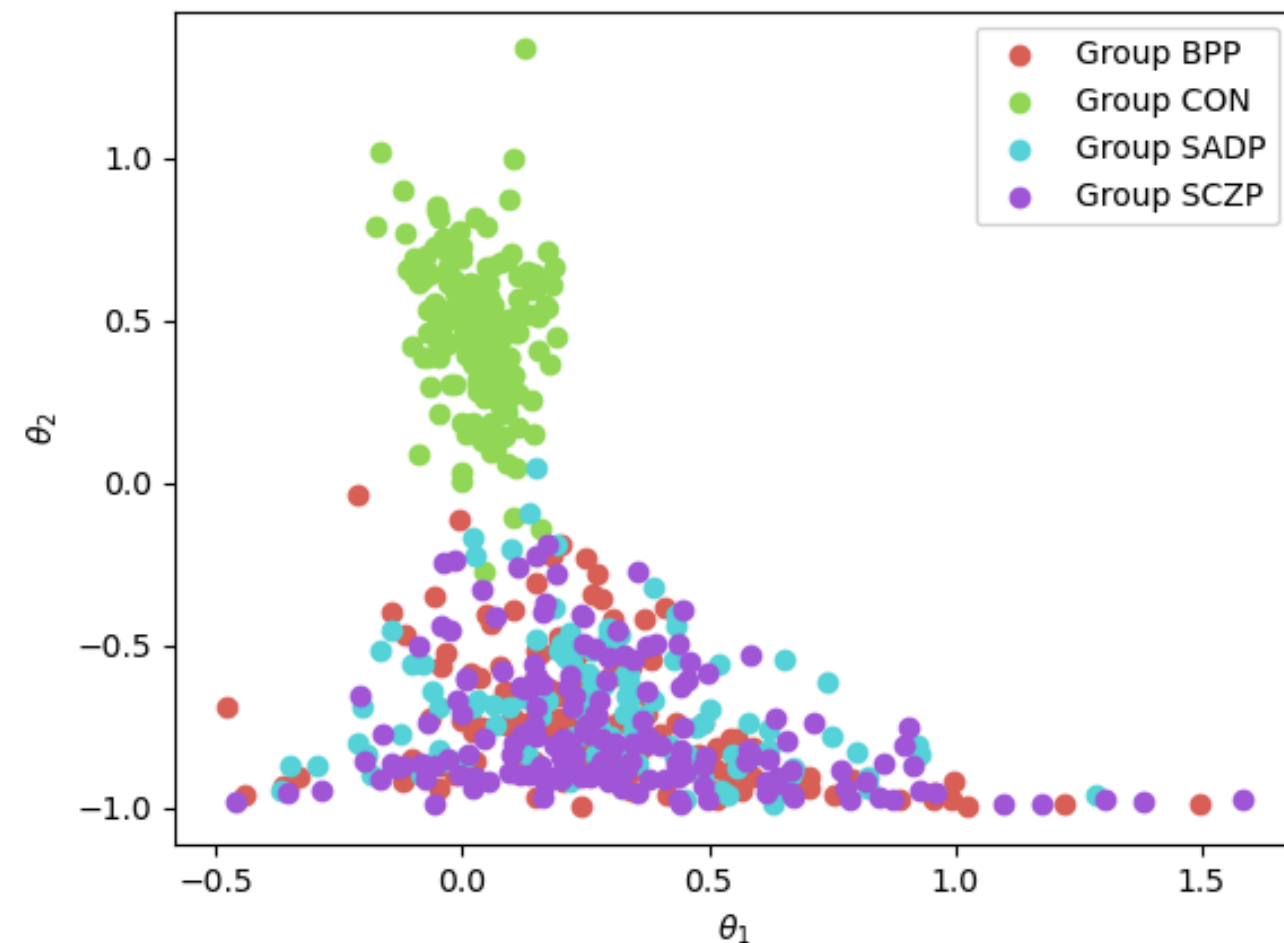
t-SNE

Conclusions

- We're able to whether a patient is healthy
  - Latent space clustering

- Multiclass classification wasn't successful
  - Dimensionality reduction
  - Methodology
  - Problem with Diagnosis