



Normative Modelling

Educational Course OHBM 2024

● The Team



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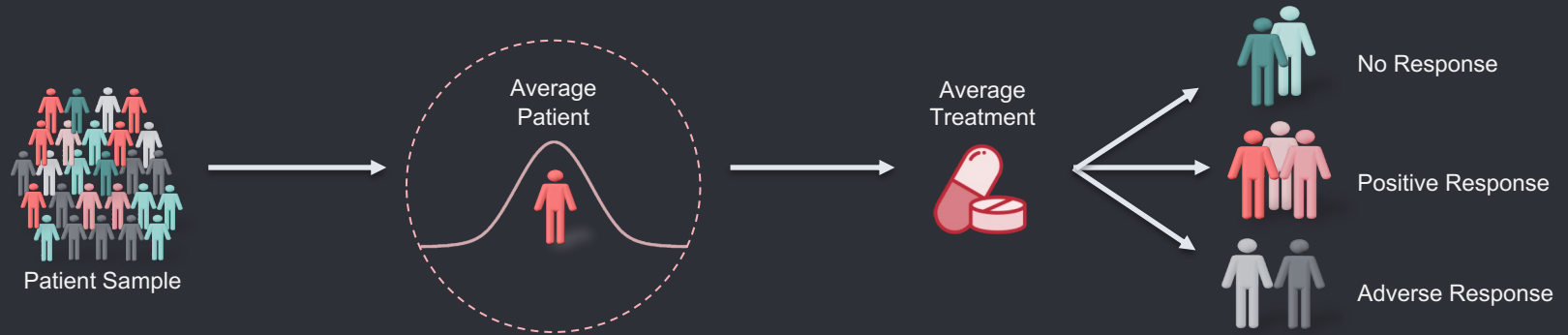
Dr. Ye Ella Tian



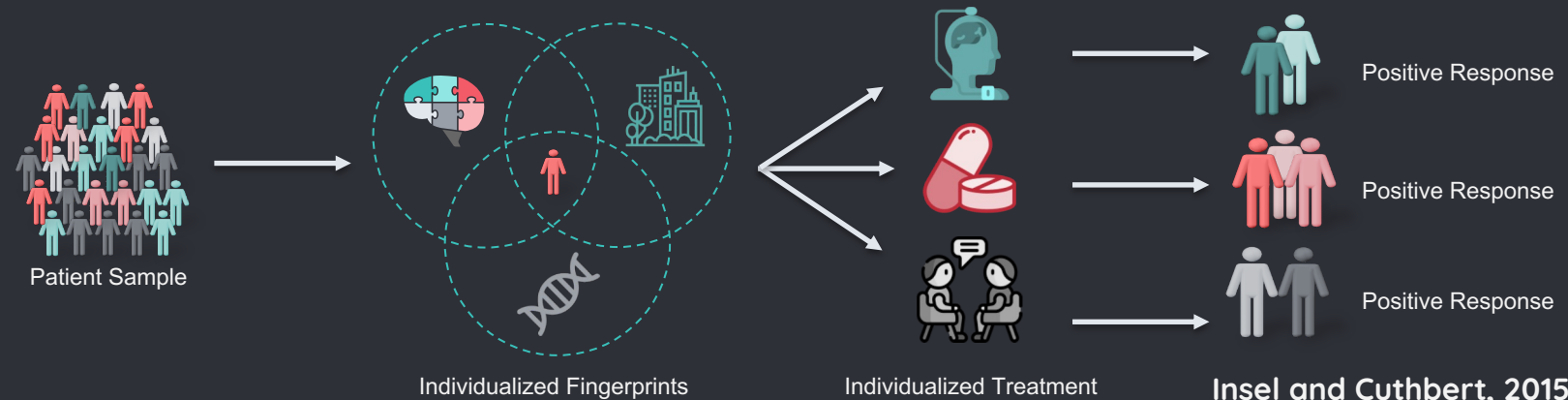
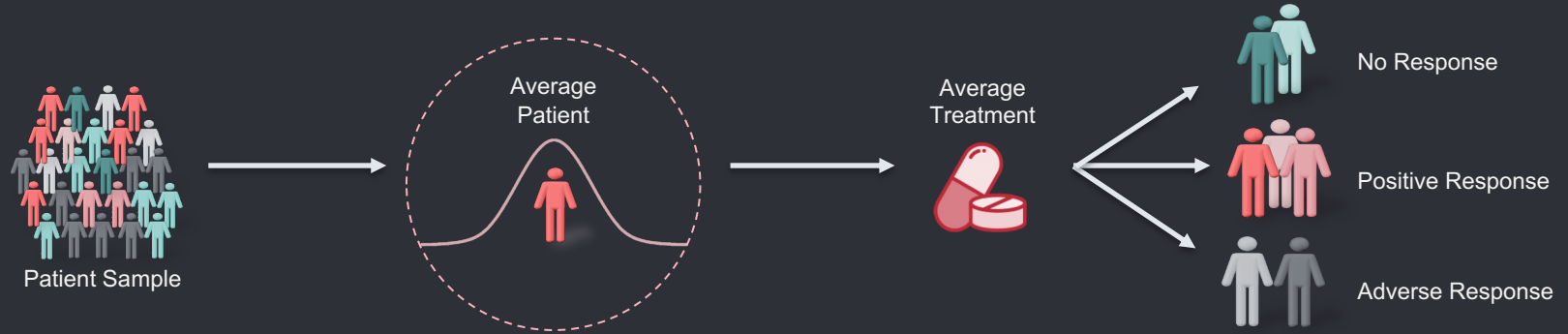
Aim: Identifying Predictive Scores

Future: Precision Medicine

● Aim: Precision Medicine



Aim: Precision Medicine

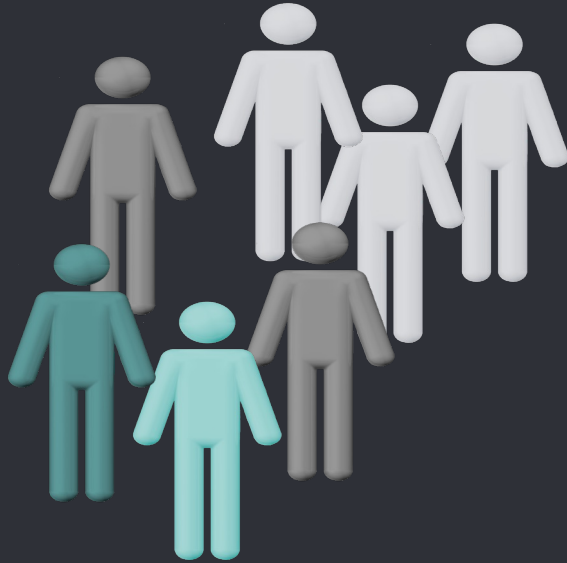




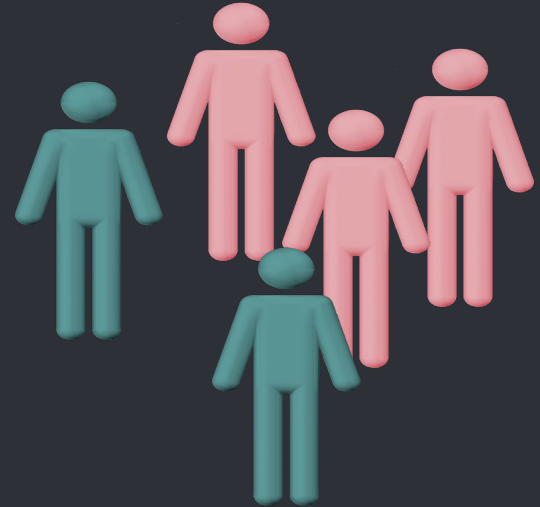
Normative Models

Understanding the heterogeneous biology underlying psychiatric disorders at the level of the individual participant.

- Problem: Heterogeneity



Patients

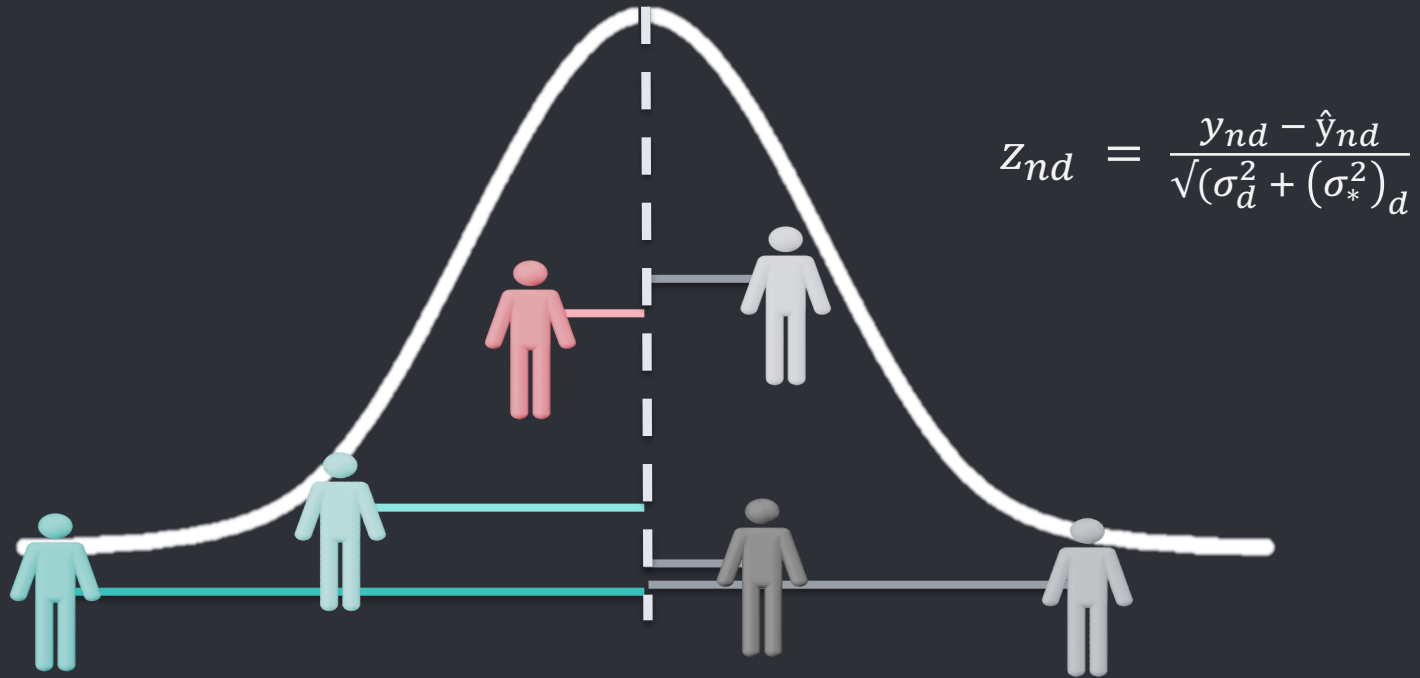


Unaffected controls

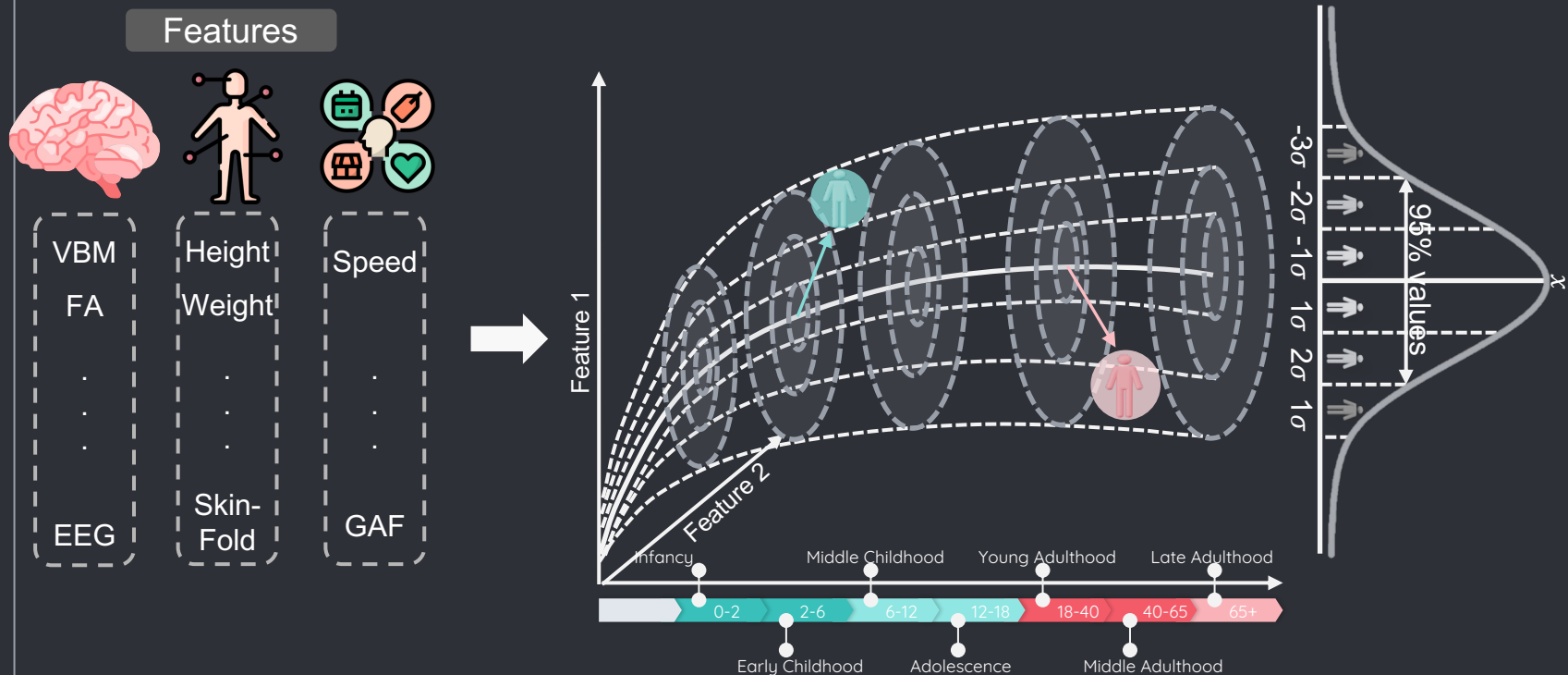
- Solution: Normative Models



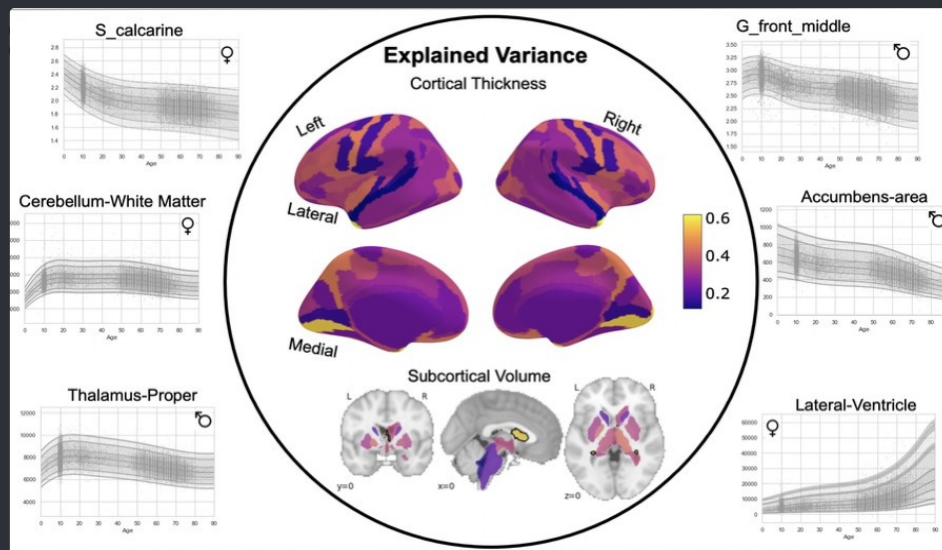
- Normative Models – Deviation Scores



Multi-Variate Normative Modelling



Applying pre-trained normative model



58,836 individuals - 82 scan sites - aged 2–100
Normative models for cortical thickness and subcortical volumes derived
from Freesurfer

Saige Rutherford et al., (2022) Charting brain growth
and aging at high spatial precision. *eLife* 11:e72904.

Extra Resources

- https://github.com/CharFraza/CPC_ML_tutorial/
- <https://predictiveclinicalneuroscience.com/>
- <https://pcntoolkit.readthedocs.io/en/latest/>
- Video Youtube: Normative Modelling & Single-Subject Analysis
- Video Youtube: OHBM OSR 2021 Emergent Session: Normative modeling using PCNtoolkit

Tutorials

- Gaussian Process Regression
- Hierarchical Bayesian Regression
- Braincharts: transfer
- Bayesian Linear Regression
- Visualization of normative modeling outputs
- Post-hoc analysis on normative modeling outputs
- Predictive modeling using deviation scores



Thanks!

ANY QUESTIONS?

You can find me at
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