

Advancing Mental Health Research through AI & Clinical Data Modernization

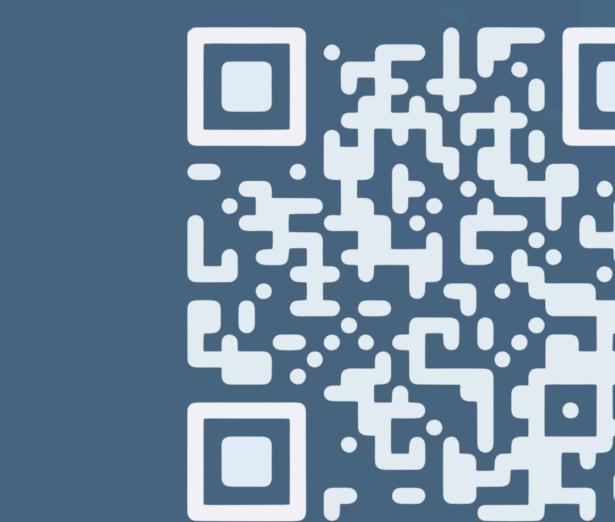
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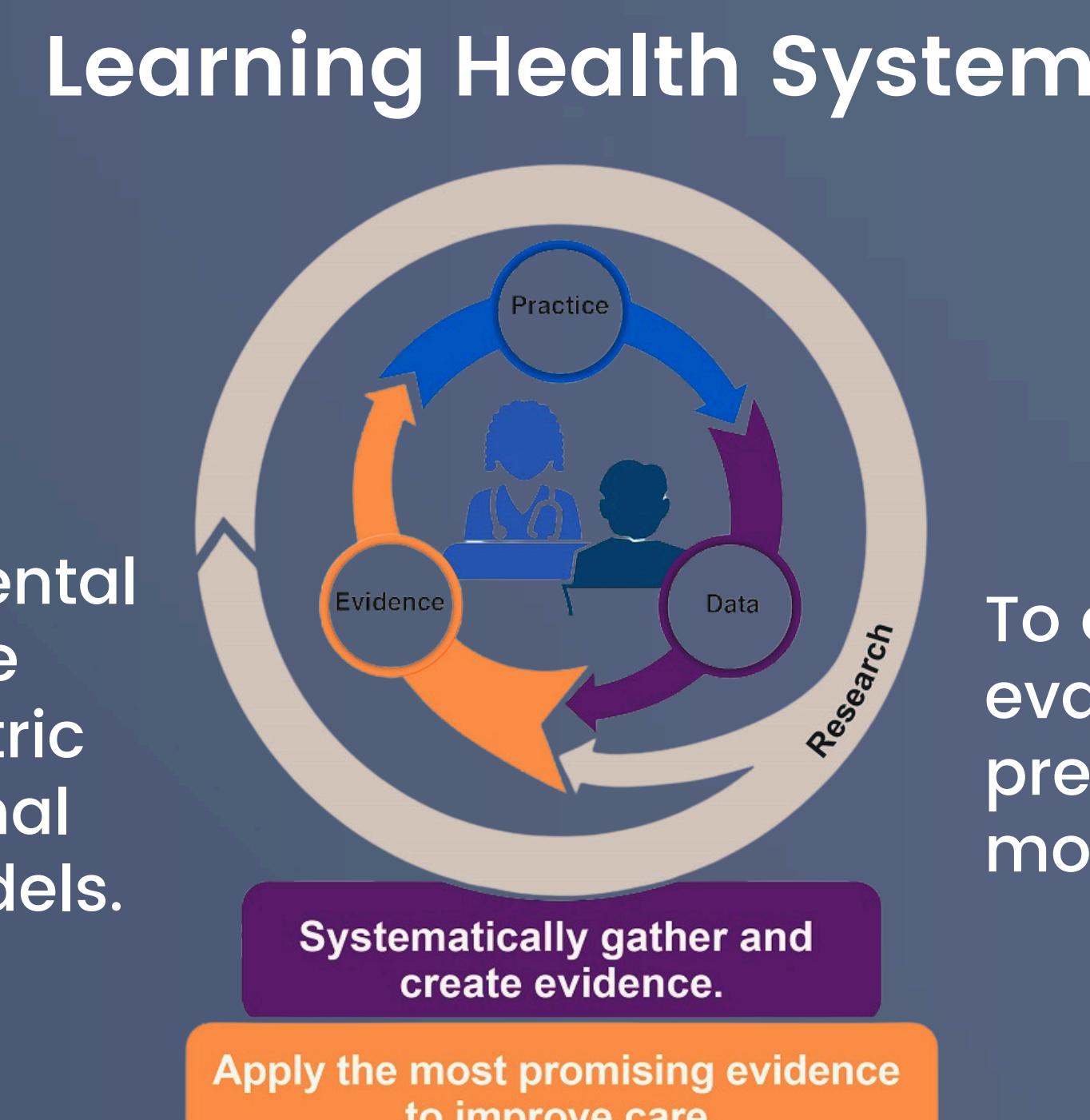
School of Behavioral Health Sciences

MINDFUL - Machine Intelligence Towards Neuropsychiatric Data for Unified Learning

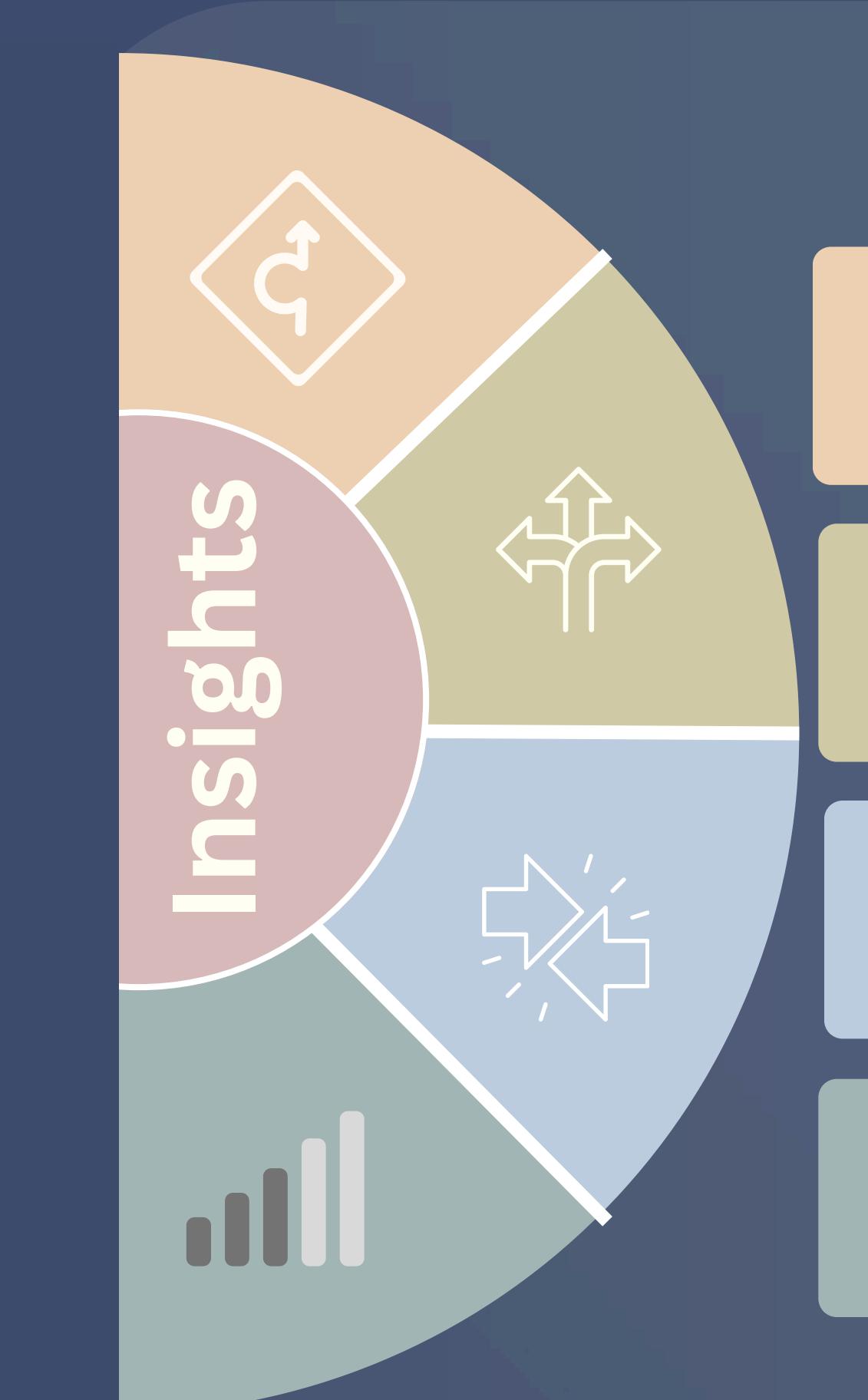
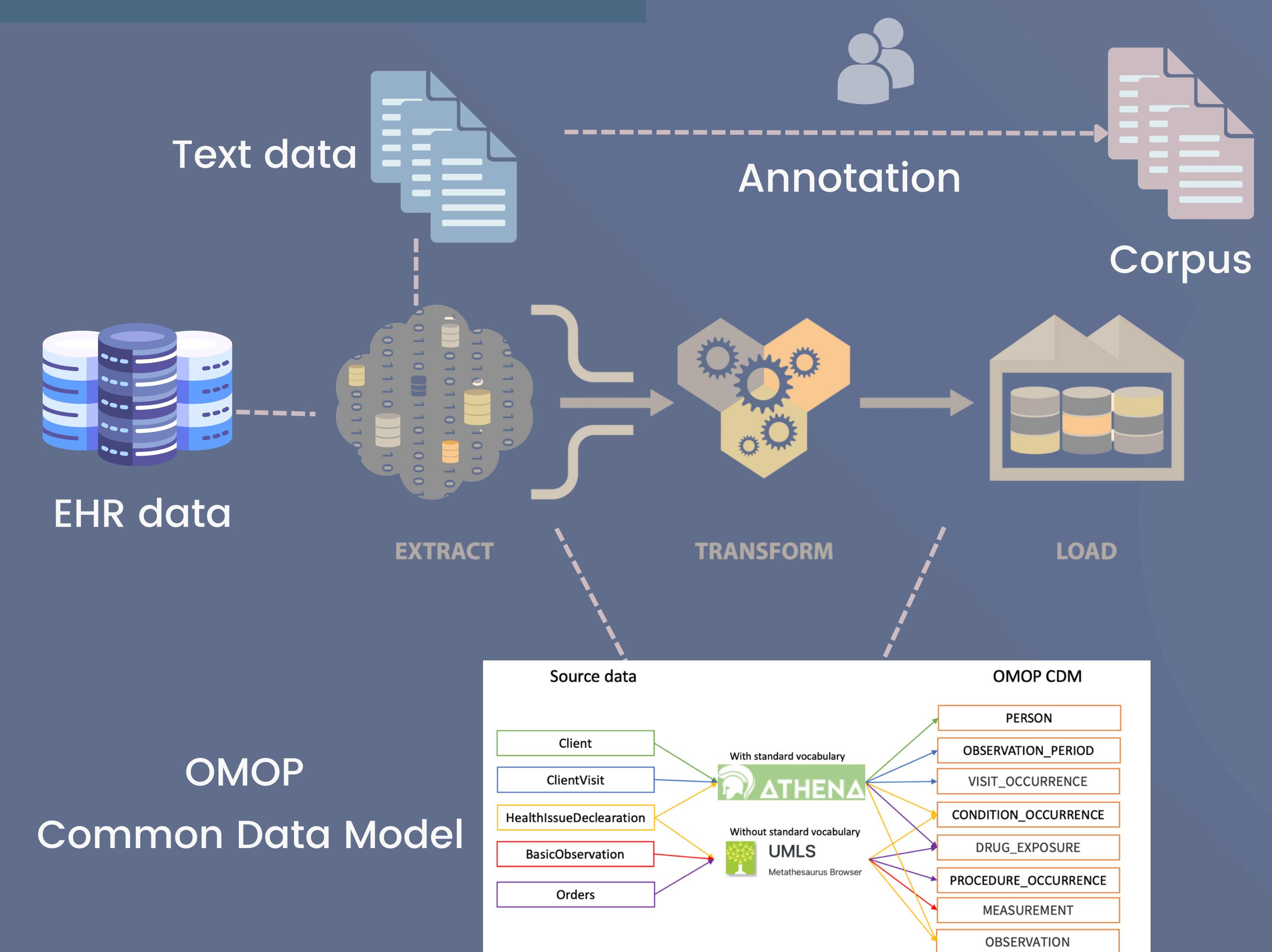
Zehan Li, Ph.D. Candidate



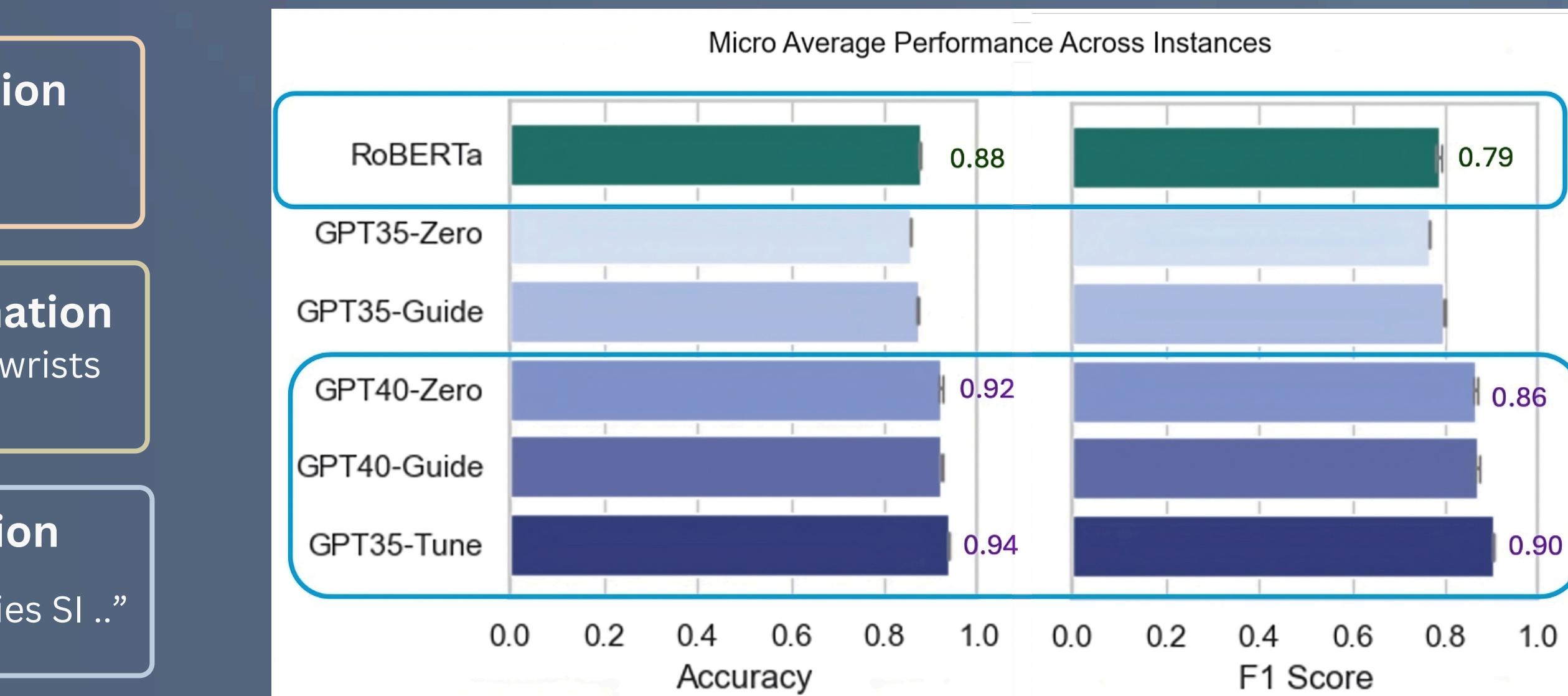
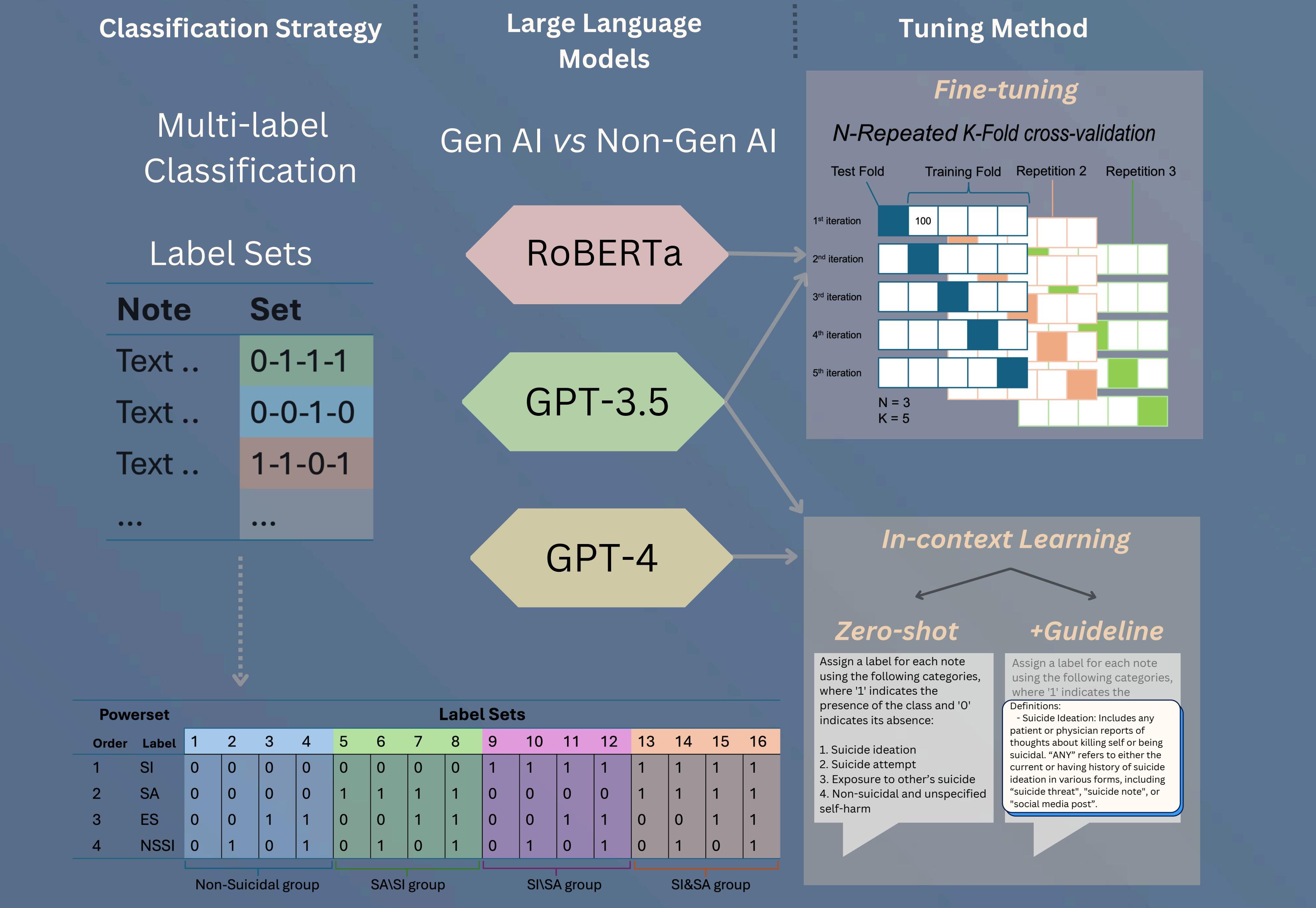
The unstructured and nuanced nature of psychiatric data poses significant challenges in interoperability, standardization, and analytical utility. This dissertation addresses these barriers by developing a novel Clinical Data Mart focused on clinical psychiatric data.



Step 1: Data Modernization



Step 2: Language Modeling



- Single multi-label classification > multiple binary classification
- Generative models > Non-generative models
- Finetuning > In-context learning

Stressful Life Event & Suicide Detection



Psychosocial crises and mental health conditions are significant factors to suicidal behaviors, with a well-established body of research linking stress to adverse health outcomes, including suicide. Despite the robust association between stress and mental health, the current SDOH ontology primarily addresses general physical health and lacks the granularity required for psychiatric-specific domains. This gap limits the utility of SDOH frameworks in advancing mental health research and psychiatric care.

Step 3: Use Cases

To systematically extract social determinants of health (SDOH) and psychological stressors from unstructured psychiatric evaluation notes and social media using NLP models.



Clinical notes

Pt. does not usually skip school and states she had good attendance. States that she ran some errands and at night she went to her boyfriend's place and they had a fight. States they have been fighting for about the last month because he has been 'rude and insensitive' to her and has been treating her differently over the past week.

Social media posts

I haven't told anything to him yet because I'm not sure how someone would take hearing that their partner has such fluctuations of feelings towards them (especially since he told me he loves me and is somewhat clingy). Nonetheless, I know a conversation will need to be had but I want to get my feelings in order first. What would you recommend. Reddit? Tl;DR I have 'hot and warm' feelings towards my boyfriend. Can't figure out why.

