NEURAL INFORMATION PROCESSING SYSTEMS

DAAC: Discrepancy-Aware Adaptive Contrastive Learning for Medical Time series

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香港中文大學（深圳）
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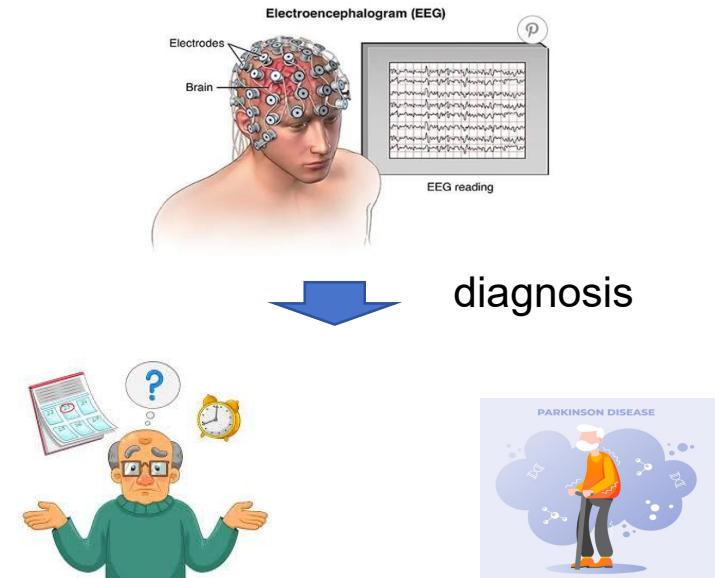
NUS
National University
of Singapore

TII Technology Innovation Institute

MOHAMED BIN ZAYED
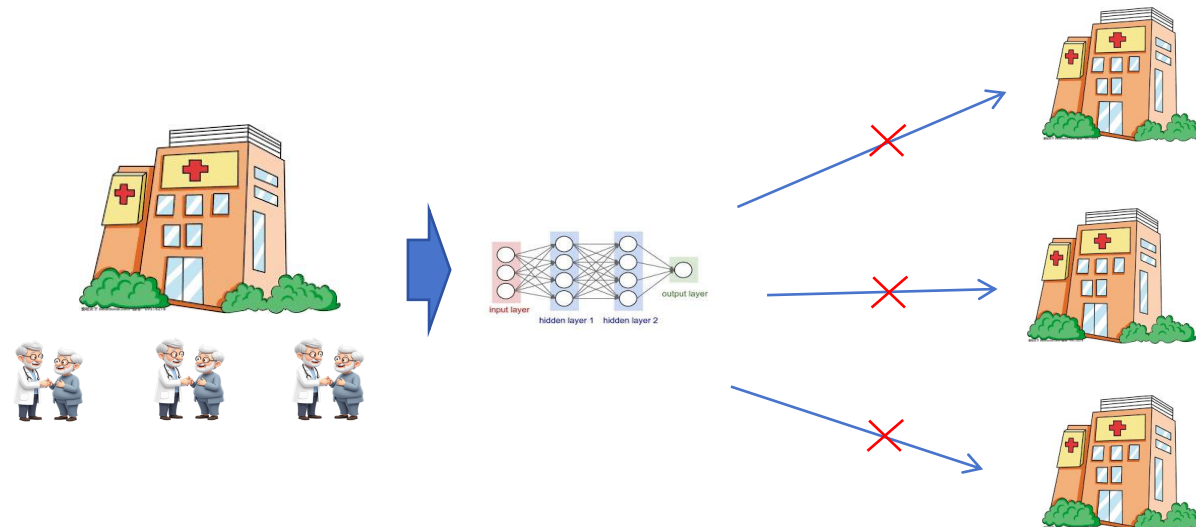UNIVERSITY OF
ARTIFICIAL INTELLIGENCE

Why EEG for Neurodegeneration?

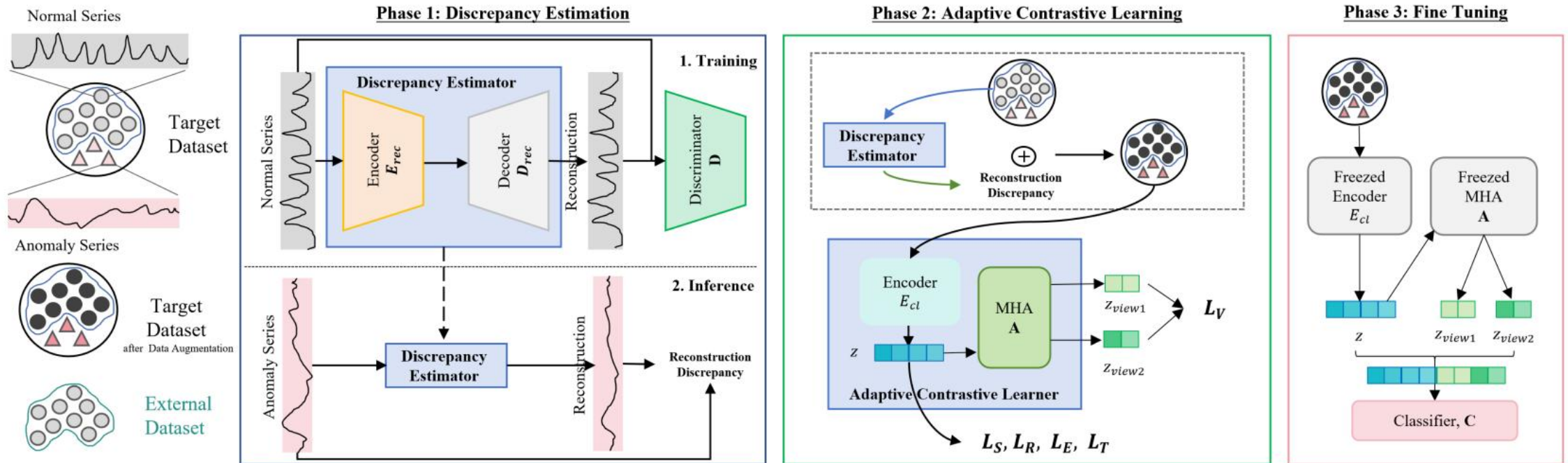- Non-invasive
- Low-cost
- Repeatable at scale

diagnosis

Motivation

- Single-center bias
- Limited labels

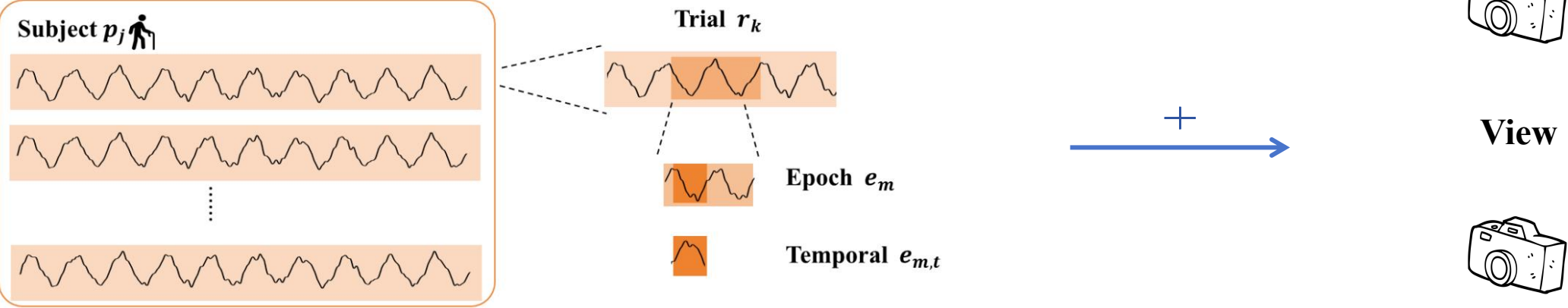Overview of our three-stage training framework

Stage 1: Training and inference of Discrepancy Estimator.

Stage 2: Training of Adaptive Contrastive Learner

Stage 3: Supervised fine-tuning

2. Method

- ➢ The **subject** j denotes the subject ID.
- ➢ A **trial** r_k refers to a continuous set of observations collected over an extended time period
- ➢ An **epoch** is a sequence of consecutive observations derived from a trial
- ➢ A **temporal** refers to a single data point or vector recorded at a specific timestamp

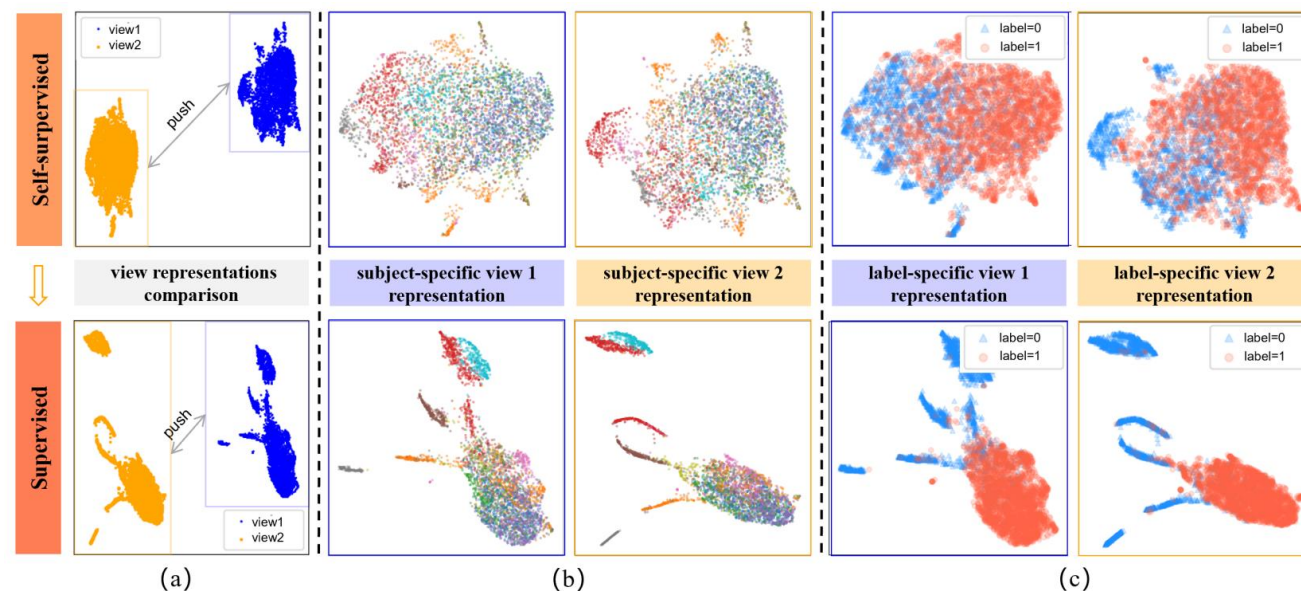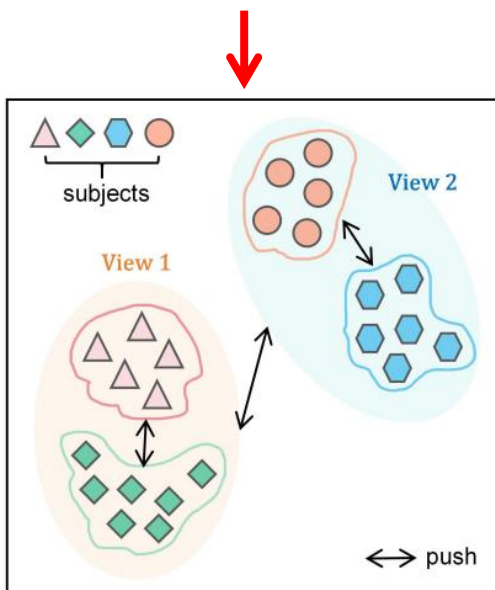Table B1: Different Models Utilize Different Levels

Models	Subject	Trial	Epoch	Temporal	View
SimCLR			✓		
TF-C			✓		
Mixing-up			✓		
TNC		✓			
TS2vec			✓	✓	
TS-TCC			✓	✓	
CLOCS	✓		✓		
COMET	✓	✓	✓	✓	
DAAC	✓	✓	✓	✓	✓

Highlight:

View1

View2

Data

latent space
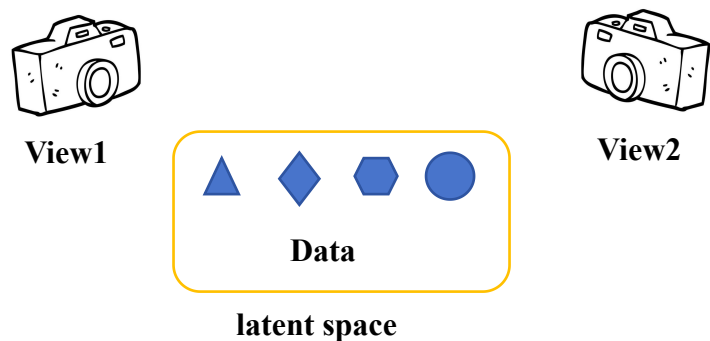
Like two cameras taking pictures at different perspectives

Visualization of Multi-View Representations on the AD Dataset. The figure compares contrastive view representations obtained through selfsupervised contrastive learning and 100% supervised fine-tuning

Paper Page： https://neurips.cc/virtual/2025/poster/115757

Thanks for your attention!

Github

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