$$\mathcal{D}_u \triangleq \{x_i\}_{i=0}^{N_u}$$

**TARGET ENCODER** 

CaliperNN + Propensity Scorer + **Memory Bank** 



 $z_n \triangleq \text{CaliperNN}(z_q)$ 



 $\mathcal{D}_l \triangleq \{x_i, y_i\}_{i=0}^{N_l}$ 

 $\theta_t' = \zeta \theta_{t-1}' + (1 - \zeta)\theta_t$ 

 $\mathcal{L}_{\text{unsup}} = d(z_q, z_n)$ 

**ONLINE ENCODER** 

**PREDICTOR** 

 $Loss(\hat{y}_i, y_i)$ i=0