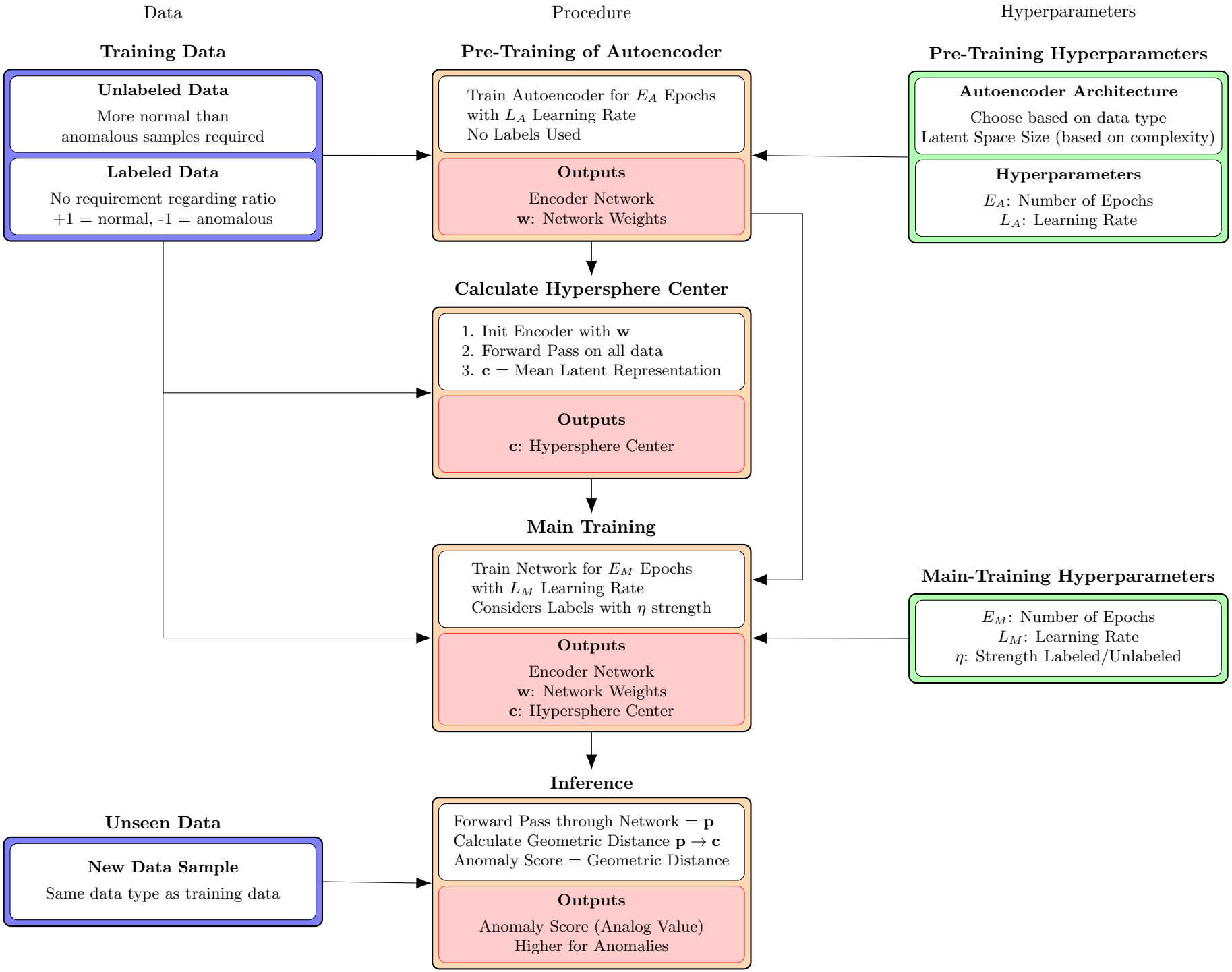
Data
Procedure
Hyperparameters
Training Data
Unlabeled Data
More normal than anomalous samples required
Labeled Data
No requirement regarding ratio
+1 = normal, -1 = anomalous
Pre-Training of Autoencoder
Train Autoencoder for E_A Epochs with L_A Learning Rate
No Labels Used
Outputs
Encoder Network
$\mathbf{w}$: Network Weights
Pre-Training Hyperparameters
Autoencoder Architecture
Choose based on data type
Latent Space Size (based on complexity)
Hyperparameters
E_A: Number of Epochs
L_A: Learning Rate
Calculate Hypersphere Center
1. Init Encoder with $\mathbf{w}$
2. Forward Pass on all data
3. $\mathbf{c}$ = Mean Latent Representation
Outputs
$\mathbf{c}$: Hypersphere Center
Main Training
Train Network for E_M Epochs with L_M Learning Rate
Considers Labels with η strength
Outputs
Encoder Network
$\mathbf{w}$: Network Weights
$\mathbf{c}$: Hypersphere Center
Main-Training Hyperparameters
E_M: Number of Epochs
L_M: Learning Rate
η: Strength Labeled/Unlabeled
Inference
Forward Pass through Network = $\mathbf{p}$
Calculate Geometric Distance $\mathbf{p} \rightarrow \mathbf{c}$
Anomaly Score = Geometric Distance
Outputs
Anomaly Score (Analog Value)
Higher for Anomalies
Unseen Data
New Data Sample
Same data type as training data