

Peak Detection - TranPD Model Implementation

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Data Preprocessing

Data Ingestion

Normalization

Sliding Windows

W - 30, 60

B - 128

Train : Test - 80 : 20

Transformer
Model

Positional Encoding

Encoder (temporal
pattern learning)**Decoder** (sequence
reconstruction)

Output layer

Two-Phase
Decoding**Phase 1:** Input +
zero error = predict
x1 (initial
reconstruction)**Phase 2:** Input +
error = predict x2
(final reconstruction)Training &
Reconstruction

Epochs = 50

D_Model = 8, 16

Loss = **MSE**
between x2 and
inputOptimizer: **Adam**error = MAE between
recon and true

Detect Peaks

Threshold - 98%

DMC2_S_CP2_52

Shape : (42016, 56)

Train : Test - 60 : 40

X_train shape: **(25191, 30)**

X_test shape: **(16795, 30)**

Num_Peaks for Train/Test - 80/20

Win_size	Latent_dim	Num_of_Peaks
30	8	168
60	16	336

Num_Peaks for Train/Test - 60/40

Laten_dim = [16, 32, 64]

Win_size = [30, 60, 120]

For W_s: 60 Dim: 32 -> Thr: 0.08055, Mean : 0.022, Max: 1.35, Min: 0.00019

Win_size	Latent_dim	Num_of_Peaks
30	16	336
60	16	336
60	32	336

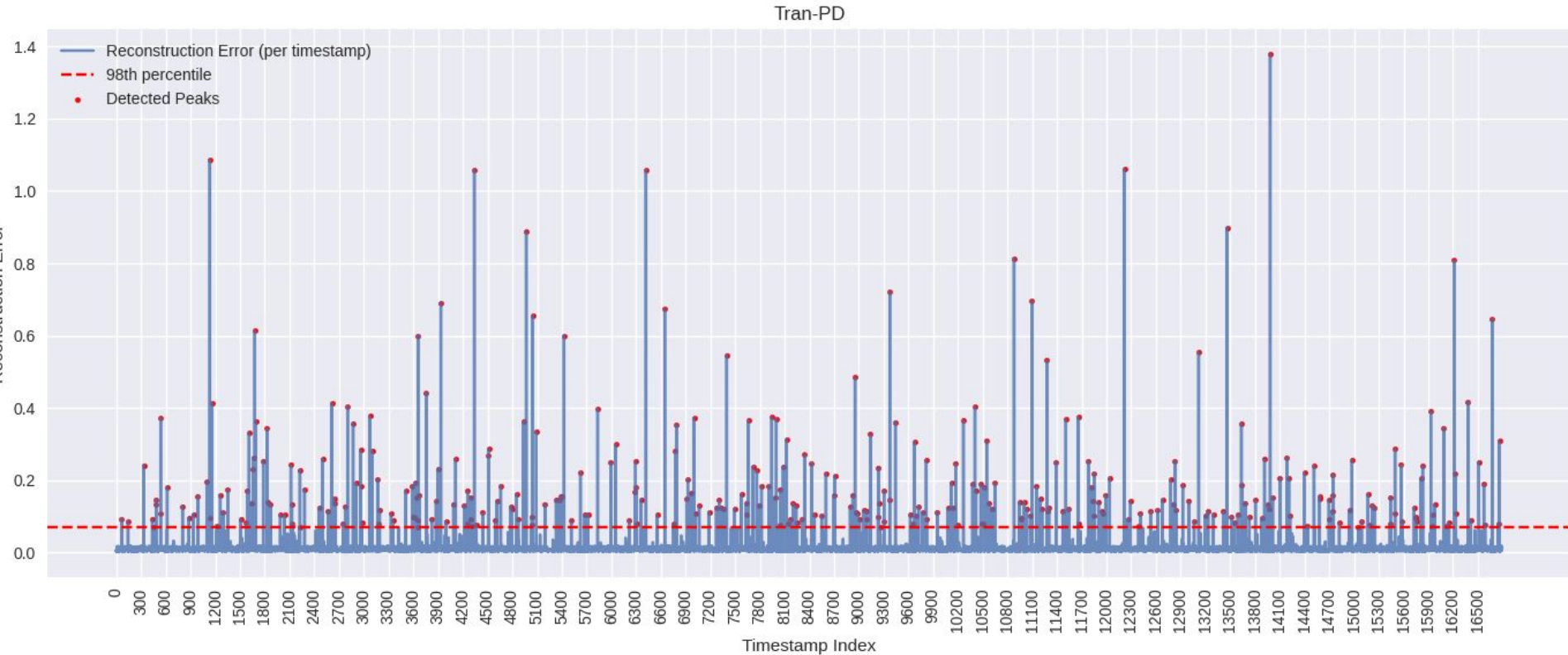


Fig : Reconstruction Error Plot - 336 Peaks, D_size : 16, W_size : 30, The : 0.07160

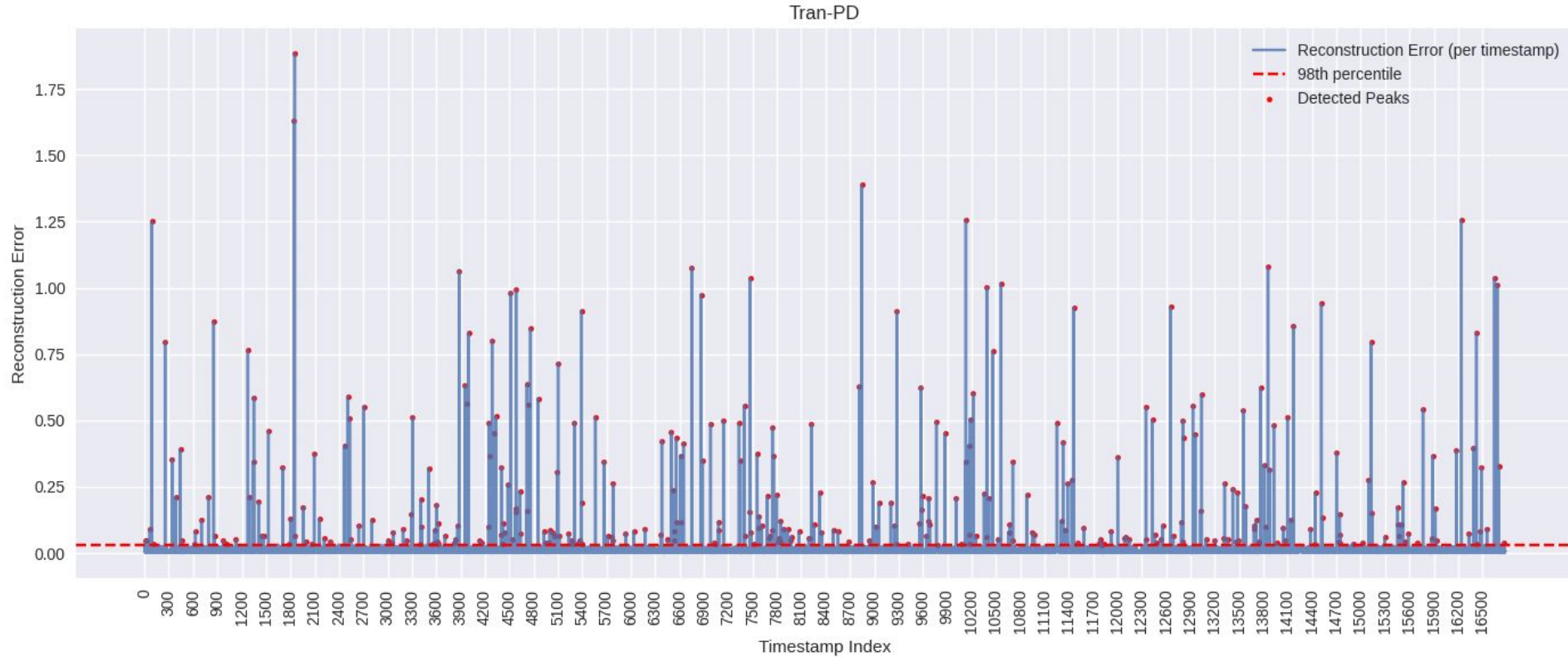


Fig : Reconstruction Error Plot - **336 Peaks**, **D_size : 16**, **W_size : 60**, **The : 0.0324**

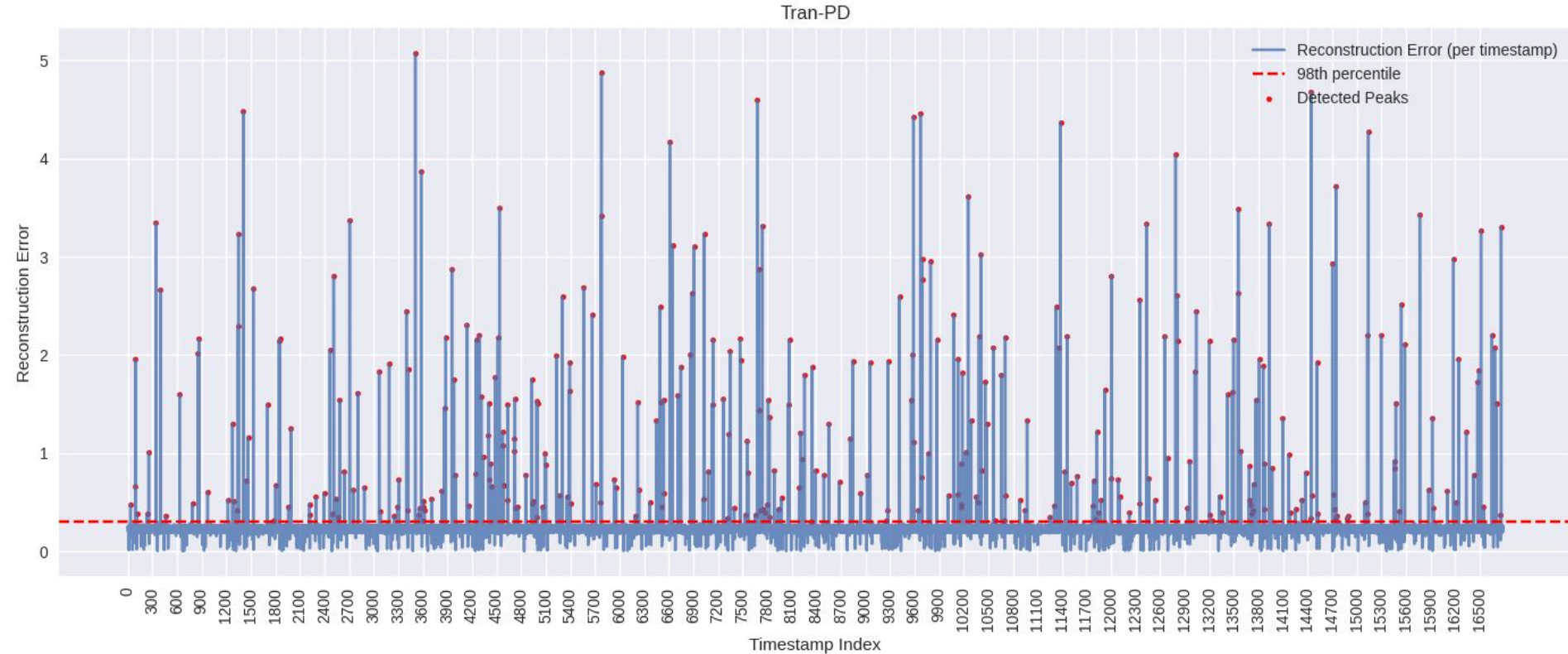


Fig : Reconstruction Error Plot - 336 Peaks, D_size : 32, W_size : 60, The : 0.08055

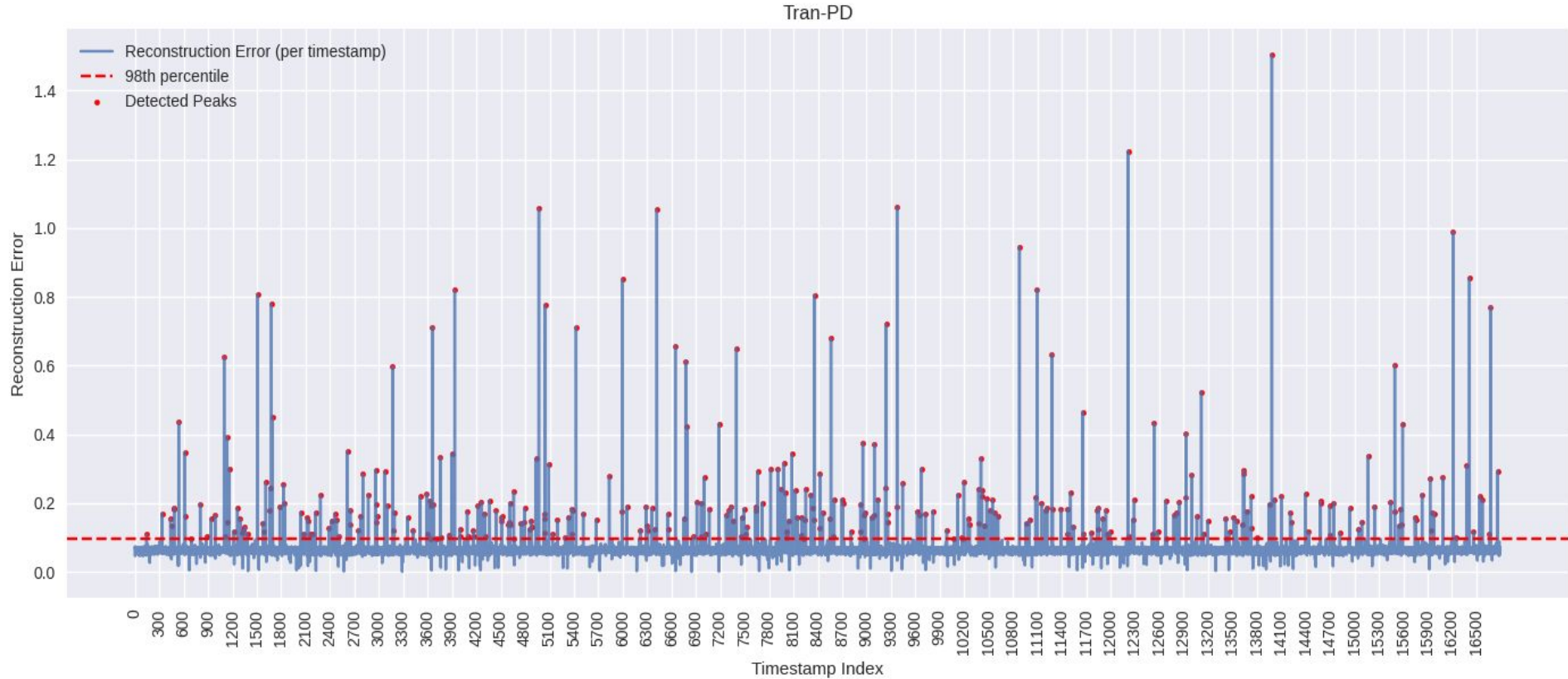


Fig : Reconstruction Error Plot - 336 Peaks, D_size : 8, W_size : 30

Peaks Dataset

Train/Test - 60/40

98th Percentile Threshold: 0.0961

Timestamp	True Value	Recon_value	Recon_error	Peak
1325	-2.29	-2.35	0.06117391	0
1326	-1.66	-1.81	0.15360876	1
1327	-2.3378913	-2.349548	0.06105676	0

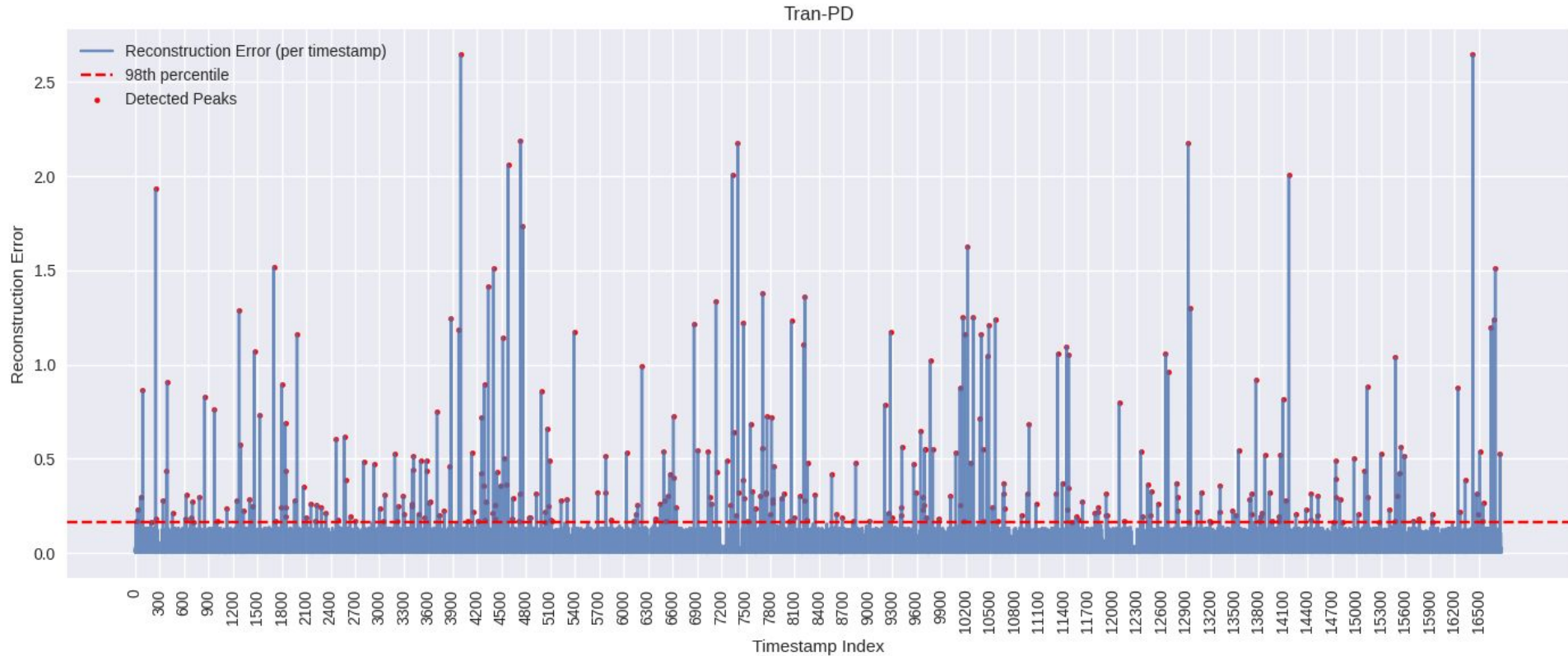


Fig : Reconstruction Error Plot - Peaks, D_size :16, W_size : 60



Thank You For Your Attention!