Peak Detection - TranPD Model Implementation

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TranPD

Data Preprocessing	Transformer Model	Two-Phase Decoding	Training & Reconstruction	Detect Peaks
Data Ingestion	Positional Encoding		Epochs = 60	Threshold - 98%
Normalization	**Encoder** (temporal pattern learning)	**Phase 1:** Input + zero error = predict x1 (initial reconstruction)	D_Model = 8	**34 Peaks Detected**
Sliding Windows			Loss = **MSE between x2 and input**	
W - 30	**Decoder** (sequence reconstruction)	**Phase 2:** Input + error = predict x2 (final reconstruction)		
B - 128			Optimizer: **Adam**	
Train : Test - 80 : 20	Output layer		error = MAE between recon and true	

DMC2_S_CP2_52

Shape : **(8403, 1)**

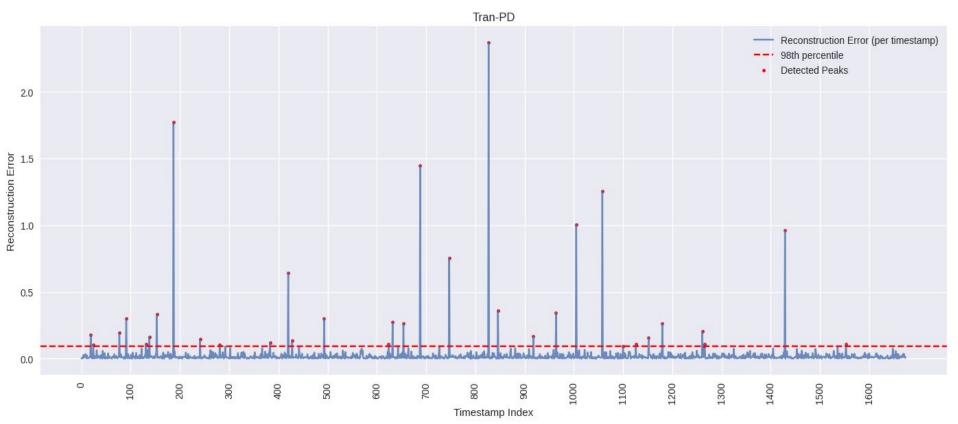X_train shape: **(6698, 30)**

X_test shape: **(1675, 30)**

Fig : Reconstruction Error Plot - **34 Peaks Detected**

TranPD - Peak Details / Results

Peaks Dataset

Min Error: 0.0
Max Error: 2.369
Mean Error: 0.0230
98th Percentile Threshold: 0.0911

Timestamp	True Value	Recon_value	Recon_error	Peak
48	-1.5637226	-1.5387852	0.024937391	0
49	30.90527	31.08308	0.17780876	1
50	-2.3378913	-2.349548	0.011656761	0

References

References

Thank You For Your Attention!