Gensparkで作成した大学教員が実際に作る資料の雰囲気やスタイルを再現した見本

＊＊＊＊ University, Intelligent Systems Lab.

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Time-series Anomaly Detection with Change-point Aware Deep Autoencoder

深層学習を用いた時系列異常検知手法の提案

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1. Problem

Multivariate sensor data often contains **sudden shifts** and **gradual drifts** due to operational changes.
Conventional Autoencoders (AE) fail to adapt to these shifts, causing high **False Positive Rates**.
Need a model robust to "Covariate Shift".
→

2. Proposed Method

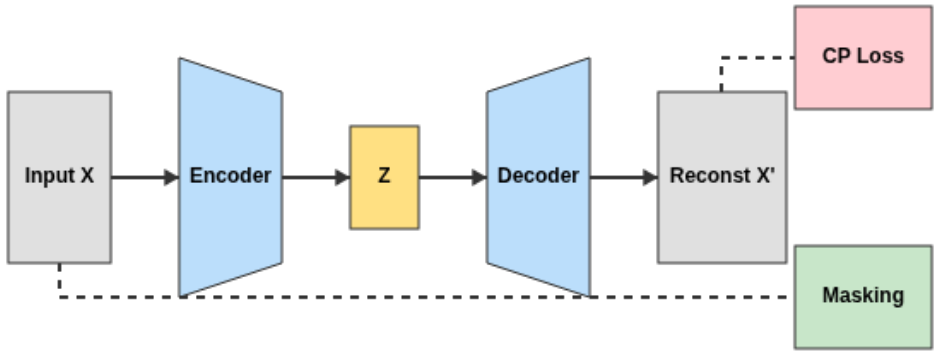

Fig 1. Architecture of Change-point Aware AE with Temporal Masking

3. Result

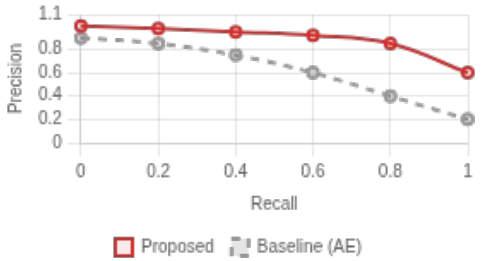

Fig 2. Precision-Recall Curve
(Dataset: Public SMAP)

4. Comparison

Model	F1-Score	Latency
Isolation Forest	0.72	< 1ms
LSTM-VAE	0.81	45ms
Donut	0.84	32ms
Proposed	**0.91**	**28ms**

Our method achieved **+6.2pt** in F1-score compared to SOTA (Donut), with reduced false alarms by 40%.

5. Conclusion

Summary:
We proposed a Change-point Aware Deep Autoencoder that robustly detects anomalies even under environmental shifts. The adaptive loss function significantly stabilizes the reconstruction error.

Future Work:
- Implementation of Online Learning for real-time adaptation.
- Application to edge devices (Raspberry Pi).

※ 実在の研究者や研究内容とは一切関係ありません。