

Highlights

ALGAN: Time Series Anomaly Detection with Adjusted-LSTM GAN

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- This article presents ALGAN, a novel anomaly detection method for time series data that leverages the power of Adjusted-LSTM (aLSTM), a new model that improves the performance of LSTM networks.
- Proposed aLSTM is a novel model that adjusts the output of LSTM by using two attention layers and two linear layers with tanh activation. The first attention layer identifies the hidden states that need adjustment, and the second attention layer weights the input sequence to prioritise important information for updating the hidden states. This reduces the information loss and enhances the temporal dependencies between the inputs and the hidden states.
- ALGAN uses aLSTM as the generator and discriminator of a GAN framework to learn the normal patterns of time series data and detect anomalies. ALGAN can handle both univariate and multivariate time series data from various domains.
- The article evaluates ALGAN on 47 time series datasets and compares it with several baseline methods, including traditional, neural network-based, existing LSTM-based GANs and other GAN-based approaches. The results show that ALGAN achieves superior performance in terms of accuracy, precision, recall, and F1-score.