

Abstract

The operation of gas pipelines in the oil and gas industry plays an important role as a distribution channel. Disturbances such as corrosion and pipe leaks can pose risks to workplace safety and result in losses to the company. Anomaly detection in gas pipeline operational data is a crucial step in preventing such incidents. This study aims to identify optimal parameters that can enhance model performance and determine the most effective method for detecting anomalies in gas pipeline operational time series data. Therefore, the results of this study are expected to provide recommendations for the most effective anomaly detection method, prevent risks due to system disruptions, and monitor the development of gas pressure distribution that can be applied by the oil and gas industry. The results of the study showed that the importance of setting hyperparameters and performing hyperparameter tuning using grid search is very effective in improving model performance. Then, the performance of the LSTM-AE model has a higher performance compared to the OC-SVM model.

Keywords: Long Short-Term Memory Auto Encoder (LSTM-AE), One Class Support Vector Machine (OC-SVM), Anomaly Detection, Gas Pipeline Network, Hyperparameters, Grid Search.