

Abstract

Oil and gas industry is a sector that requires workplace safety and smooth production cycles. Anomaly detection in natural gas pipeline operations can assist in monitoring and mitigating risks in the natural gas processing process. This study compares the performance of the Long Short-Term Memory (LSTM) and Gated Recurrent Unit (GRU) methods in detecting anomalies in natural gas transmission operational data. Both methods are quite popular for handling forecasting or anomaly detection tasks. Performance evaluation is conducted using metrics such as Mean Squared Error (MSE), Root Mean Squared Error (RMSE), Mean Absolute Error (MAE), and Mean Absolute Percentage Error (MAPE). It was found that although GRU generally outperforms, LSTM can identify anomalies more accurately for certain features.

Keywords: anomaly detection, long short-term memory, gated recurrent unit, natural gas pipeline
