

## REFERENCES

- [1] J. E. T. Bistline and D. T. Young, "The role of natural gas in reaching net-zero emissions in the electric sector," *Nature Communications*, vol. 13, no. 1, p. 4743, 2022. [Online]. Available: <https://doi.org/10.1038/s41467-022-32468-w>
- [2] S. Aljameel, D. Alomari, S. Alismail, F. Khawaher, A. Alkudhair, F. Aljubran, and R. Alzannan, "An anomaly detection model for oil and gas pipelines using machine learning," *Computation*, vol. 10, no. 8, p. 138, 2022. [Online]. Available: <https://doi.org/10.3390/computation10080138>
- [3] A. F. Ihsan and W. Astuti, "Deep learning based anomaly detection on natural gas pipeline operational data," in *2022 2nd International Conference on Intelligent Cybernetics Technology and Applications, ICICyTA 2022*, 2022, pp. 228–233. [Online]. Available: <https://doi.org/10.1109/ICICyTA57421.2022.10037988>
- [4] F. Kadri, F. Harrou, S. Chaabane, Y. Sun, and C. Tahon, "Seasonal arma-based spc charts for anomaly detection: Application to emergency department systems," *Neurocomputing*, vol. 173, pp. 2102–2114, Jan 2016. [Online]. Available: <https://doi.org/10.1016/j.neucom.2015.10.009>
- [5] V. Kozitsin, I. Katsner, and D. Lakontsev, "Online Forecasting and Anomaly Detection Based on the ARIMA Model," *Applied Sciences*, vol. 11, no. 7, Art. no. 3194, 2021. doi: 10.3390/app11073194. [Online]. Available: <https://www.mdpi.com/2076-3417/11/7/3194>
- [6] J. Yao, W. Wu, and S. Li, "Anomaly detection model of mooring system based on LSTM PCA method," *Ocean Engineering*, vol. 254, Art. no. 111350, 2022. doi: 10.1016/j.oceaneng.2022.111350. [Online]. Available: [www.sciencedirect.com/science/article/pii/S0029801822007405](http://www.sciencedirect.com/science/article/pii/S0029801822007405)
- [7] M. Jain, G. Kaur, and V. Saxena, "A K-Means clustering and SVM based hybrid concept drift detection technique for network anomaly detection," *Expert Systems with Applications*, vol. 193, Art. no. 116510, 2022. doi: 10.1016/j.eswa.2022.116510. [Online]. Available: [www.sciencedirect.com/science/article/pii/S0957417422000112](http://www.sciencedirect.com/science/article/pii/S0957417422000112)
- [8] S. Ying, B. Wang, L. Wang, Q. Li, Y. Zhao, J. Shang, H. Huang, G. Cheng, Z. Yang, and J. Geng, "An Improved KNN-Based Efficient Log Anomaly Detection Method with Automatically Labeled Samples," *ACM Trans. Knowl. Discov. Data*, vol. 15, no. 3, Art. no. 34, Apr. 2021. doi: 10.1145/3441448. [Online]. Available: <https://doi.org/10.1145/3441448>
- [9] N. Chen, H. Tu, X. Duan, L. Hu, and C. Guo, "Semisupervised anomaly detection of multivariate time series based on a variational autoencoder," *Applied Intelligence*, Jul. 2022. [Online]. Available: <https://doi.org/10.1007/s10489-022-03829-1>
- [10] H. D. Nguyen, K. P. Tran, S. Thomassey, and M. Hamad, "Forecasting and Anomaly Detection approaches using LSTM and LSTM Autoencoder techniques with the applications in supply chain management," *Int. J. Inf. Manag.*, vol. 57, p. 102282, 2021. doi: 10.1016/j.ijinfomgt.2020.102282. [Online]. Available: [www.sciencedirect.com/science/article/pii/S026840122031481X](http://www.sciencedirect.com/science/article/pii/S026840122031481X)
- [11] F. F. Abir, et al, "PCovNet+: A CNN-VAE anomaly detection framework with LSTM embeddings for smartwatch-based COVID-19 detection," *Eng. Appl. Artif. Intell.*, vol. 122, p. 106130, 2023. doi: 10.1016/j.engappai.2023.106130. [Online]. Available: [www.sciencedirect.com/science/article/pii/S0952197623003147](http://www.sciencedirect.com/science/article/pii/S0952197623003147)
- [12] Z. Niu, K. Yu, and X. Wu, "Lstm-based vae-gan for time-series anomaly detection," *Sensors*, vol. 20, no. 13, p. 3738, Jul 2020. [Online]. Available: <https://doi.org/10.3390/s20133738>
- [13] W. Fernandes, K. S. Komati, and K. Assis de Souza Gazolli, "Anomaly detection in oil-producing wells: a comparative study of one-class classifiers in a multivariate time series dataset," *Journal of Petroleum Exploration and Production Technology*, vol. 14, pp. 343–363, 2024. [Online]. Available: <https://doi.org/10.1007/s13202-023-01710-6>
- [14] P. E. Aranha, L. G. Lopes, E. S. Paranhos Sobrinho, I. M. Oliveira, J. P. de Araujo, B. B. Santos, E. T. Lima Junior, T. B. da Silva, T. M. Vieira, W. W. Lira, N. A. Policarpo, and M. A. Sampaio, "A system to detect oilwell anomalies using deep learning and decision diagram dual approach," *SPE Journal*, 2023. [Online]. Available: <https://doi.org/10.2118/218017-PA>
- [15] Y. Lian, Y. Geng, and T. Tian, "Anomaly detection method for multivariate time series data of oil and gas stations based on digital twin and mtad-gan," *Applied Sciences*, vol. 13, no. 3, p. 1891, 2023. [Online]. Available: <https://doi.org/10.3390/app13031891>
- [16] B. Wu, C. Fang, Z. Yao, Y. Tu, and Y. Chen, "Decompose autotransformer time series anomaly detection for network management," *Electronics*, vol. 12, p. 354, 01 2023. [Online]. Available: <https://doi.org/10.3390/electronics12020354>
- [17] O. Ibdunmoye, A.-R. Rezaie, and E. Elmroth, "Adaptive anomaly detection in performance metric streams," *IEEE Transactions on Network and Service Management*, vol. PP, pp. 1–1, 09 2017. [Online]. Available: <https://doi.org/10.1109/TNSM.2017.2750906>
- [18] G. Lee, Y. Yoon, and K. Lee, "Anomaly Detection Using an Ensemble of Multi-Point LSTMs," *Entropy*, vol. 25, no. 11, Art. no. 1480, 2023. doi: 10.3390/e25111480. [Online]. Available: <https://www.mdpi.com/1099-4300/25/11/1480>
- [19] X. Xia, X. Pan, N. Li, X. He, L. Ma, X. Zhang, and N. Ding, "GAN-based anomaly detection: A review," *Neurocomputing*, vol. 493, pp. 497–535, 2022. doi: 10.1016/j.neucom.2021.12.093. [Online]. Available: <http://www.sciencedirect.com/science/article/pii/S09525231221019482>
- [20] A. Mac'kiewicz and W. Ratajczak, "Principal components analysis (pca)," *Computers Geosciences*, vol. 19, no. 3, pp. 303–342, 1993. [Online]. Available: [https://www.sciencedirect.com/science/article/pii/S009830049390090R](http://www.sciencedirect.com/science/article/pii/S009830049390090R)
- [21] Q. Wen, J. Gao, X. Song, L. Sun, H. Xu, and S. Zhu, "Robuststl: A robust seasonal-trend decomposition algorithm for long time series," *Proceedings of the AAAI Conference on Artificial Intelligence*, vol. 33, pp. 5409–5416, 07 2019.
- [22] A. Dasari and A. Rammohan, "Integrating level shift anomaly detection for fault diagnosis of battery management system for lithium-ion batteries," *IEEE Access*, vol. PP, pp. 1–1, 01 2024
- [23] Z. Niu, K. Yu, and X. Wu, "LSTM-Based VAE-GAN for Time-Series Anomaly Detection," *Sensors*, vol. 20, Art. no. 3738, Jul. 2020. doi: 10.3390/s20133738.
- [24] D. Fourure, M. U. Javaid, N. Posocco, and S. Tihon, "Anomaly detection: How to artificially increase your f1-score with a biased evaluation protocol," 2021. [Online]. Available: <https://arxiv.org/abs/2106.16020>
- [25] H. Qi, "Research on forecasting for different types of small sample time series data," in *2022 6th Annual International Conference on Data Science and Business Analytics (ICDSBA)*, 2022, pp. 58–65.
- [26] A. Abdelkhalik and M. Mashaly, "Addressing the class imbalance problem in network intrusion detection systems using data resampling and deep learning," *The Journal of Supercomputing*, vol. 79, no. 10, pp. 10611–10644, Jul. 2023. doi: 10.1007/s11227-023-05073-x. [Online]. Available: <https://doi.org/10.1007/s11227-023-05073-x>