

REFERENCES

- [1] N. Nawiyah, R. C. Kaemong, M. A. Ilham, and F. Muhammad, "Penyebab Pengaruhnya Pertumbuhan Pasar Indonesia Terhadap Produk Skin Care Lokal Pada Tahun 2022," *ARMADA J. Penelit. Multidisiplin*, vol. 1, no. 12, pp. 1390–1396, 2023, doi: 10.55681/armada.v1i12.1060.
- [2] C. M. Annur, "Ada 27 Juta Pengguna Twitter di Indonesia, Terbanyak ke-4 Global," databoks. [Online]. Available: <https://databoks.katadata.co.id/teknologi-telekomunikasi/statistik/75dd4b36866dc54/ada-27-juta-pengguna-twitter-di-indonesia-terbanyak-ke-4-global#:~:text=Ada 27 Juta Pengguna Twitter di Indonesia%2C Terbanyak ke-4 Global,-Teknologi %26 Telekomunikasi&tex>
- [3] W. Medhat, A. Hassan, and H. Korashy, "Sentiment analysis algorithms and applications: A survey," *Ain Shams Eng. J.*, vol. 5, no. 4, pp. 1093–1113, 2014, doi: 10.1016/j.asej.2014.04.011.
- [4] Y. Li and N. Li, "Sentiment Analysis of Weibo Comments Based on Graph Neural Network," *IEEE Access*, vol. 10, pp. 23497–23510, 2022, doi: 10.1109/ACCESS.2022.3154107.
- [5] J. H. Computer, S. M. Honova, V. P. Computer, C. A. Setiawan, I. H. Parmonangan, and Diana, "Sentiment Analysis of Skincare Product Reviews in Indonesian Language using IndoBERT and LSTM," *Proceeding - IEEE 9th Inf. Technol. Int. Semin. ITIS 2023*, no. 2022, pp. 1–6, 2023, doi: 10.1109/ITIS59651.2023.10420222.
- [6] B. Liang, H. Su, L. Gui, E. Cambria, and R. Xu, "Aspect-based sentiment analysis via affective knowledge enhanced graph convolutional networks," *Knowledge-Based Syst.*, vol. 235, p. 107643, 2022, doi: 10.1016/j.knosys.2021.107643.
- [7] T. Yan and F. Liu, "COVID-19 sentiment analysis using college subreddit data," *PLoS One*, vol. 17, no. 11 November, pp. 1–18, 2022, doi: 10.1371/journal.pone.0275862.
- [8] R. Gao, L. Jiang, Z. Zou, Y. Li, and Y. Hu, "A Graph Convolutional Network Based on Sentiment Support for Aspect-Level Sentiment Analysis," *Appl. Sci.*, vol. 14, no. 7, 2024, doi: 10.3390/app14072738.
- [9] C. Hasya Yutika, W. Maharani, and A. Romadhony, "Aspect Extraction on Indonesia Beauty Product Review Using Pre-Trained Language Model," *2024 Int. Conf. Data Sci. Its Appl.*, pp. 219–224, 2024, doi: 10.1109/icodsa62899.2024.10652031.
- [10] H. T. Phan, N. T. Nguyen, and D. Hwang, "Aspect-Level Sentiment Analysis Using CNN Over BERT-GCN," *IEEE Access*, vol. 10, no. August, pp. 110402–110409, 2022, doi: 10.1109/ACCESS.2022.3214233.
- [11] A. A. Chamid, Widowati, and R. Kusumaningrum, "Graph-Based Semi-Supervised Deep Learning for Indonesian Aspect-Based Sentiment Analysis," *Big Data Cogn. Comput.*, vol. 7, no. 1, 2023, doi: 10.3390/bdcc7010005.
- [12] E. Fernandez, Anderies, M. G. Winata, F. H. Fasya, and A. A. S. Gunawan, "Improving IndoBERT for Sentiment Analysis on Indonesian Stock Trader Slang Language," *Proc. 2022 IEEE Int. Conf. Internet Things Intell. Syst. IoTaIS 2022*, pp. 240–244, 2022, doi: 10.1109/IoTaIS56727.2022.9975975.
- [13] Muhammad Rizki Nurfiqri; Fitriyani, "The Performance Analysis of Graph Neural Network (GNN) and Convolutional Neural Network (CNN) Algorithms for Cyberbullying Detection in Twitter Comments," *Indones. J. Comput. Sci.*, vol. 13, no.

- 3, pp. 3656–3667, 2024.
- [14] D. O. Nooryawati, F. A. Bachtiar, and A. Ridok, “Deciphering Consumer Skin Care Needs: Analyzing Sentiments and Review Topics of Cetaphil Facial Wash Across Diverse Skin Types,” *Proceeding - Int. Conf. Inf. Technol. Comput. 2023, ICITCOM 2023*, pp. 291–296, 2023, doi: 10.1109/ICITCOM60176.2023.10442129.
 - [15] F. N. Viana, “Klasifikasi Emosi Opini Twitter Menggunakan Model Benchmark Indonlu,” 2024, [Online]. Available: [https://repository.ar-raniry.ac.id/id/eprint/35631/%0Ahttps://repository.ar-raniry.ac.id/id/eprint/35631/1/Farla Nara Viana, 190705037, FST, TI.pdf](https://repository.ar-raniry.ac.id/id/eprint/35631/%0Ahttps://repository.ar-raniry.ac.id/id/eprint/35631/1/Farla%20Nara%20Viana,%20190705037,%20FST,%20TI.pdf)
 - [16] J. Devlin, M. W. Chang, K. Lee, and K. Toutanova, “BERT: Pre-training of deep bidirectional transformers for language understanding,” *NAACL HLT 2019 - 2019 Conf. North Am. Chapter Assoc. Comput. Linguist. Hum. Lang. Technol. - Proc. Conf.*, vol. 1, no. Mlm, pp. 4171–4186, 2019.
 - [17] F. Koto, A. Rahimi, J. H. Lau, and T. Baldwin, “IndoLEM and IndoBERT: A Benchmark Dataset and Pre-trained Language Model for Indonesian NLP,” *COLING 2020 - 28th Int. Conf. Comput. Linguist. Proc. Conf.*, pp. 757–770, 2020, doi: 10.18653/v1/2020.coling-main.66.
 - [18] L. Waikhom and R. Patgiri, “An empirical investigation on BigGraph using deep learning,” in *Advances in Computers*, vol. 128, 2023, pp. 107–133. doi: 10.1016/bs.adcom.2021.09.007.
 - [19] “Graph Convolutional Networks (GCNs): Architectural Insights and Applications,” [geeksforgeeks.org](https://www.geeksforgeeks.org/graph-convolutional-networks-gcns-architectural-insights-and-applications/). Accessed: Nov. 09, 2024. [Online]. Available: <https://www.geeksforgeeks.org/graph-convolutional-networks-gcns-architectural-insights-and-applications/>
 - [20] “Graph Convolutional Network 概説,” 2017. Accessed: Nov. 09, 2024. [Online]. Available: https://docs.dgl.ai/en/0.8.x/tutorials/models/1_gnn/1_gcn.html
 - [21] P. Veličković, A. Casanova, P. Liò, G. Cucurull, A. Romero, and Y. Bengio, “Graph attention networks,” *6th Int. Conf. Learn. Represent. ICLR 2018 - Conf. Track Proc.*, pp. 1–12, 2018, doi: 10.1007/978-3-031-01587-8_7.
 - [22] “Understand Graph Attention Network — DGL 0.8.2post1 documentation.” Accessed: Nov. 09, 2024. [Online]. Available: https://docs.dgl.ai/en/0.8.x/tutorials/models/1_gnn/9_gat.html
 - [23] R. Yacouby and D. Axman, “Probabilistic Extension of Precision, Recall, and F1 Score for More Thorough Evaluation of Classification Models,” pp. 79–91, 2020, doi: 10.18653/v1/2020.eval4nlp-1.9.