

DAFTAR PUSTAKA

- Abercrombie, G., Dinkar, T., Cercas Curry, A., Rieser, V., & Hovy, D. (2025). Consistency is Key: Disentangling Label Variation in Natural Language Processing with Intra-Annotator Agreement. *Proceedings of the The 4th Workshop on Perspectivist Approaches to NLP*, 63–74. <https://doi.org/10.18653/v1/2025.nlperspectives-1.6>
- Aberdeen, J., Bayer, S., Clark, C., Keybl, M., & Tresner-Kirsch, D. (2019). An annotation and modeling schema for prescription regimens. *Journal of biomedical semantics*, 10(1). <https://doi.org/10.1186/S13326-019-0201-9>
- Abilio, R., Coelho, G. P., & da Silva, A. E. A. (2024). Evaluating Named Entity Recognition: A comparative analysis of mono- and multilingual transformer models on a novel Brazilian corporate earnings call transcripts dataset. *Applied Soft Computing*, 166. <https://doi.org/10.1016/j.asoc.2024.112158>
- Akiba, T., Sano, S., Yanase, T., Ohta, T., & Koyama, M. (2019). Optuna: A Next-generation Hyperparameter Optimization Framework. *Proceedings of the ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*, 2623–2631. <https://doi.org/10.1145/3292500.3330701>
- Ali, N. S. M., & Shafeeq, B. M. (2025). Comparison of Deep Neural Network Models (LSTM, Bi-LSTM, GRU and Bi-GRU) for Gold Price Prediction. *2025 3rd International Conference on Business Analytics for Technology and Security (ICBATS)*, 1–5. <https://doi.org/10.1109/ICBATS66542.2025.11258353>
- Anbu, A., Doreen Hephzibah Miriam, D., & Rene Robin, C. R. (2024). A Comprehensive WebScraping of IMDb's Top 50 Movies using Beautiful Soup. *2024 International Conference on Communication, Computing and Internet of Things, IC3IoT 2024 - Proceedings*. <https://doi.org/10.1109/IC3IoT60841.2024.10550225>
- Äyräväinen, L. E. M., Hinds, J., & Davidson, B. I. (2025). Disambiguating sentiment annotation: A mixed methods investigation of annotator experience and impact of instructions on annotator agreement. *PLOS ONE*, 20(12), e0336269. <https://doi.org/10.1371/JOURNAL.PONE.0336269>
- Badan Pusat Statistik Indonesia. (2023). *Angka Kematian Ibu/AKI (Maternal Mortality Rate/MMR) Hasil Long Form SP2020 Menurut Provinsi, 2020*. <https://www.bps.go.id/id/statistics-table/1/MjIxOSMx/angka-kematian-ibu-aki--maternal-mortality-rate-mmr---hasil-long-form-sp2020-menurut-provinsi--2020.html>
- Bao, T., Ren, N., Luo, R., Wang, B., Shen, G., & Guo, T. (2021). A BERT-Based Hybrid Short Text Classification Model Incorporating CNN and Attention-Based BiGRU. *Journal of Organizational and End User Computing*, 33(6), 1–21. <https://doi.org/10.4018/JOEUC.294580>

- Basha, S. H. S., Dubey, S. R., Pulabaigari, V., & Mukherjee, S. (2020). Impact of fully connected layers on performance of convolutional neural networks for image classification. *Neurocomputing*, 378, 112–119. <https://doi.org/10.1016/j.neucom.2019.10.008>
- Cahuantzi, R., Chen, X., & Güttel, S. (2023). A comparison of LSTM and GRU networks for learning symbolic sequences. *Lecture Notes in Networks and Systems*, 739 LNNS, 771–785. https://doi.org/10.1007/978-3-031-37963-5_53
- Cho, K., Van Merriënboer, B., Gulcehre, C., Bahdanau, D., Bougares, F., Schwenk, H., & Bengio, Y. (2014). Learning Phrase Representations using RNN Encoder-Decoder for Statistical Machine Translation. *EMNLP 2014 - 2014 Conference on Empirical Methods in Natural Language Processing, Proceedings of the Conference*, 1724–1734. <https://doi.org/10.3115/v1/d14-1179>
- Corro, C. (2024). A Fast and Sound Tagging Method for Discontinuous Named-Entity Recognition. *EMNLP 2024 - 2024 Conference on Empirical Methods in Natural Language Processing, Proceedings of the Conference*, 19506–19518. <https://doi.org/10.18653/V1/2024.EMNLP-MAIN.1087>
- Dai, X., & Adel, H. (2020). An Analysis of Simple Data Augmentation for Named Entity Recognition. *COLING 2020 - 28th International Conference on Computational Linguistics, Proceedings of the Conference*, 3861–3867. <https://doi.org/10.18653/V1/2020.COLING-MAIN.343>
- Devlin, J., Chang, M.-W., Lee, K., Google, K. T., & Language, A. I. (2019). BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding. *Proceedings of the 2019 Conference of the North*, 4171–4186. <https://doi.org/10.18653/V1/N19-1423>
- Ding, Y., Zhou, X., & Zhang, X. (2019). YNU_DYX at SemEval-2019 Task 5: A Stacked BiGRU Model Based on Capsule Network in Detection of Hate. *NAACL HLT 2019 - International Workshop on Semantic Evaluation, SemEval 2019, Proceedings of the 13th Workshop*, 535–539. <https://doi.org/10.18653/V1/S19-2096>
- El Moussaoui, T., & Loqman, C. (2024). Advancements in Arabic Named Entity Recognition: A Comprehensive Review. *IEEE Access*, 12, 180238–180266. <https://doi.org/10.1109/ACCESS.2024.3491897>
- Feng, S. Y., Gangal, V., Wei, J., Chandar, S., Vosoughi, S., Mitamura, T., & Hovy, E. (2021). A Survey of Data Augmentation Approaches for NLP. *Findings of the Association for Computational Linguistics: ACL-IJCNLP 2021*, 968–988. <https://doi.org/10.18653/V1/2021.FINDINGS-ACL.84>

- Feurer, M., & Hutter, F. (2019). Hyperparameter Optimization. Dalam *Automated Machine Learning: Methods, Systems, Challenges* (hlm. 3–33). Springer, Cham. https://doi.org/10.1007/978-3-030-05318-5_1
- Fraile Navarro, D., Ijaz, K., Rezazadegan, D., Rahimi-Ardabili, H., Dras, M., Coiera, E., & Berkovsky, S. (2023). Clinical named entity recognition and relation extraction using natural language processing of medical free text: A systematic review. *International Journal of Medical Informatics*, 177, 105122. <https://doi.org/10.1016/J.IJMEDINF.2023.105122>
- Freire, P., Srivallapanondh, S., Spinnler, B., Napoli, A., Costa, N., Prilepsky, J. E., & Turitsyn, S. K. (2024). Computational Complexity Optimization of Neural Network-Based Equalizers in Digital Signal Processing: A Comprehensive Approach. *Journal of Lightwave Technology*, 42(12), 4177–4201. <https://doi.org/10.1109/JLT.2024.3386886>
- Fu, S., Chen, D., He, H., Liu, S., Moon, S., Peterson, K. J., Shen, F., Wang, L., Wang, Y., Wen, A., Zhao, Y., Sohn, S., & Liu, H. (2020). Clinical concept extraction: A methodology review. *Journal of Biomedical Informatics*, 109, 103526. <https://doi.org/10.1016/J.JBI.2020.103526>
- Ganesh, P., Chen, Y., Lou, X., Khan, M. A., Yang, Y., Sajjad, H., Nakov, P., Chen, D., & Winslett, M. (2021). Compressing Large-Scale Transformer-Based Models: A Case Study on BERT. *Transactions of the Association for Computational Linguistics*, 9, 1061–1080. https://doi.org/10.1162/TACL_A_00413
- Glez-Peña, D., Lourenço, A., López-Fernández, H., Reboiro-Jato, M., & Fdez-Riverola, F. (2014). Web scraping technologies in an API world. *Briefings in Bioinformatics*, 15(5), 788–797. <https://doi.org/10.1093/BIB/BBT026>
- Hendrycks, D., & Gimpel, K. (2016). *Gaussian Error Linear Units (GELUs)*. <https://arxiv.org/pdf/1606.08415>
- Hou, Z., Gao, Y., & Fan, M. (2024). Research on Named Entity Recognition in Tibetan Medicine Based on BERT-BiGRU-CRF Model. *2024 9th International Conference on Intelligent Computing and Signal Processing, ICSP 2024*, 899–903. <https://doi.org/10.1109/ICSP62122.2024.10743973>
- Ignasius, D., Dewi, I. N., Norman, M. B. C., & Sani, R. R. (2025). Medical Named Entity Recognition from Indonesian Health-News using BiLSTM-CRF with Static and Contextual Embeddings. *Journal of Applied Informatics and Computing*, 9(6), 2974–2985. <https://doi.org/10.30871/JAIC.V9I6.11574>
- Jozefowicz, R., Zaremba, W., & Sutskever, I. (2015). An empirical exploration of recurrent network architectures. *Proceedings of the 32nd International Conference on Machine Learning - Volume 37, ICML '15*, 2342–2350.

- Katona, T., Tóth, G., Petró, M., & Harangi, B. (2024). Developing New Fully Connected Layers for Convolutional Neural Networks with Hyperparameter Optimization for Improved Multi-Label Image Classification. *Mathematics* 2024, Vol. 12, Page 806, 12(6), 806. <https://doi.org/10.3390/MATH12060806>
- Kementerian Kesehatan Republik Indonesia. (2025). *SSGI 2024: Prevalensi Stunting Nasional Turun Menjadi 19,8%*. <https://kemkes.go.id/id/ssgi-2024-prevalensi-stunting-nasional-turun-menjadi-198>
- Khurana, D., Koli, A., Khatter, K., & Singh, S. (2022). Natural language processing: state of the art, current trends and challenges. *Multimedia Tools and Applications* 2022 82:3, 82(3), 3713–3744. <https://doi.org/10.1007/S11042-022-13428-4>
- Kim, D., Lee, J., So, C. H., Jeon, H., Jeong, M., Choi, Y., Yoon, W., Sung, M., & Kang, J. (2019). A Neural Named Entity Recognition and Multi-Type Normalization Tool for Biomedical Text Mining. *IEEE Access*, 7, 73729–73740. <https://doi.org/10.1109/ACCESS.2019.2920708>
- Koto, F., Rahimi, A., Lau, J. H., & Baldwin, T. (2020). IndoLEM and IndoBERT: A Benchmark Dataset and Pre-trained Language Model for Indonesian NLP. *COLING 2020 - 28th International Conference on Computational Linguistics, Proceedings of the Conference*, 757–770. <https://doi.org/10.18653/V1/2020.COLING-MAIN.66>
- Kunilovskaya, M., & Plum, A. (2021). *Text Preprocessing and its Implications in a Digital Humanities Project* (hlm. 85–93). https://doi.org/10.26615/issn.2603-2821.2021_013
- Kusumawardani, R. P., & Kusumawati, K. N. (2024). Named entity recognition in the medical domain for Indonesian language health consultation services using bidirectional-lstm-crf algorithm. *Procedia Computer Science*, 245, 1146–1156. <https://doi.org/10.1016/J.PROCS.2024.10.344>
- Lafferty, J., McCallum, A., & Pereira, F. C. N. (2001). *Conditional Random Fields: Probabilistic Models for Segmenting and Labeling Sequence Data* (Nomor 159). <https://repository.upenn.edu/handle/20.500.14332/6188>
- Lample, G., Ballesteros, M., Subramanian, S., Kawakami, K., & Dyer, C. (2016). Neural Architectures for Named Entity Recognition. *2016 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies, NAACL HLT 2016 - Proceedings of the Conference*, 260–270. <https://doi.org/10.18653/V1/N16-1030>
- Lauriola, I., Lavelli, A., & Aiolli, F. (2022). An introduction to Deep Learning in Natural Language Processing: Models, techniques, and tools. *Neurocomputing*, 470, 443–456. <https://doi.org/10.1016/J.NEUCOM.2021.05.103>

- Lee, M. (2023). Mathematical Analysis and Performance Evaluation of the GELU Activation Function in Deep Learning. *Journal of Mathematics*, 2023(1), 4229924. <https://doi.org/10.1155/2023/4229924>
- Li, F., Jin, Y., Liu, W., Rawat, B. P. S., Cai, P., & Yu, H. (2019). Fine-Tuning Bidirectional Encoder Representations From Transformers (BERT)-Based Models on Large-Scale Electronic Health Record Notes: An Empirical Study. *JMIR medical informatics*, 7(3), e14830. <https://doi.org/10.2196/14830>
- Li, I., Pan, J., Goldwasser, J., Verma, N., Wong, W. P., Nuzumlali, M. Y., Rosand, B., Li, Y., Zhang, M., Chang, D., Taylor, R. A., Krumholz, H. M., & Radev, D. (2021). Neural Natural Language Processing for Unstructured Data in Electronic Health Records: a Review. *Computer Science Review*, 46. <https://doi.org/10.1016/j.cosrev.2022.100511>
- Li, J., Sun, A., Han, J., & Li, C. (2022). A Survey on Deep Learning for Named Entity Recognition. *IEEE Transactions on Knowledge and Data Engineering*, 34(1), 50–70. <https://doi.org/10.1109/TKDE.2020.2981314>
- Li, L., Zheng, S., & Wang, Q. (2021). RoBERTa and Stacked Bidirectional GRU for Fine-grained Chinese Named Entity Recognition. *ACM International Conference Proceeding Series*, 95–100. <https://doi.org/10.1145/3460569.3460576;PAGE:STRING:ARTICLE/CHAPTER>
- Madadzadeh, F., & Bahariniya, S. (2026). A Tutorial on Sample Size Calculation for Inter-rater and Intra-rater Agreement Studies. *Indian Journal of Psychological Medicine*, 02537176261422290. <https://doi.org/10.1177/02537176261422290>
- McHugh, M. L. (2012). Interrater reliability: The kappa statistic. *Biochemia Medica*, 22(3), 276–282. <https://doi.org/10.11613/BM.2012.031/FULLARTICLE>
- Meng, Z., Zhao, F., & Liang, M. (2021). SS-MLP: A Novel Spectral-Spatial MLP Architecture for Hyperspectral Image Classification. *Remote Sensing 2021, Vol. 13, Page 4060*, 13(20), 4060. <https://doi.org/10.3390/RS13204060>
- Mosbach, M., Andriushchenko, M., & Klakow, D. (2021). On the Stability of Fine-tuning BERT: Misconceptions, Explanations, and Strong Baselines. *ICLR 2021 - 9th International Conference on Learning Representations*.
- Mulyadita, U., Sutanto, E., Fiqri, M., Setiawan, E., Pattnaik, A., Mulyadita, U., Sutanto, E., Fiqri, M., Setiawan, E., & Pattnaik, A. (2025). *Mapping Telemedicine in Indonesia: Evidence for Policy Action at a Critical Juncture*. www.thinkwell.global
- Mulyana, R. N. (2021). *Didukung 43.000 dokter, platform Alodokter aktif layani 30 juta pengguna setiap bulan*. <https://industri.kontan.co.id/news/didukung-43000-dokter-platform-alodokter-aktif-layani-30-juta-pengguna-setiap-bulan>

- Nath, N., Lee, S. H., & Lee, I. (2022). NEAR: Named entity and attribute recognition of clinical concepts. *Journal of Biomedical Informatics*, 130, 104092. <https://doi.org/10.1016/J.JBI.2022.104092>
- Nurlankyzy, A., & Kulakayeva, A. (2025). *Comparative analysis of CNN-BiGRU and CNN-BiLSTM architectures for voice activity detection under low signal-to-noise ratio conditions*.
- Powers, D. M. W., & Ailab. (2011). *Evaluation: From Precision, Recall and F-Measure to ROC, Informedness, Markedness and Correlation*. 2(1), 37–63. <http://www.bioinfo.in/contents.php?id=51>
- Qin, Q., Zhao, S., & Liu, C. (2021). A BERT-BiGRU-CRF Model for Entity Recognition of Chinese Electronic Medical Records. *Complexity*, 2021(1), 6631837. <https://doi.org/10.1155/2021/6631837>
- Rama, T., Brekke, P. H., Nytrø, Ø., & Øvreliid, L. (2018). *Iterative development of family history annotation guidelines using a synthetic corpus of clinical text*. 111–121.
- Raza, M. R., Hussain, W., & Merigo, J. M. (2021). Cloud Sentiment Accuracy Comparison using RNN, LSTM and GRU. *Proceedings - 2021 Innovations in Intelligent Systems and Applications Conference, ASYU 2021*. <https://doi.org/10.1109/ASYU52992.2021.9599044>
- Rogers, A., Kovaleva, O., & Rumshisky, A. (2020). A Primer in BERTology: What we know about how BERT works. *Transactions of the Association for Computational Linguistics*, 8, 842–866. https://doi.org/10.1162/tacl_a_00349
- Saad, M., Yang, T., & Zhou, H. (2022). A Comparison of Bidirectional GRU and LSTM for Hand Gesture Recognition Using Leap Motion. *Proceedings - 2022 37th Youth Academic Annual Conference of Chinese Association of Automation, YAC 2022*, 1427–1433. <https://doi.org/10.1109/YAC57282.2022.10023591>
- Santoso, J., Sutanto, P., Cahyadi, B. K., & Setiawan, E. I. (2024). Pushing the Limits of Low-Resource NER Using LLM Artificial Data Generation. *Proceedings of the Annual Meeting of the Association for Computational Linguistics*, 9652–9667. <https://doi.org/10.18653/V1/2024.FINDINGS-ACL.575>
- Savova, G. K., Masanz, J. J., Ogren, P. V., Zheng, J., Sohn, S., Kipper-Schuler, K. C., & Chute, C. G. (2010). Mayo clinical Text Analysis and Knowledge Extraction System (cTAKES): architecture, component evaluation and applications. *Journal of the American Medical Informatics Association: JAMIA*, 17(5), 507. <https://doi.org/10.1136/JAMIA.2009.001560>
- Siino, M., Tinnirello, I., & La Cascia, M. (2024). Is text preprocessing still worth the time? A comparative survey on the influence of popular preprocessing methods on

- Transformers and traditional classifiers. *Information Systems*, 121, 102342. <https://doi.org/10.1016/J.IS.2023.102342>
- SNOMED Terminology Solutions, C. (2008). *SNOMED Clinical Terms® User Guide*.
- Srivastava, N., Hinton, G., Krizhevsky, A., Sutskever, I., & Salakhutdinov, R. (2014). Dropout: A Simple Way to Prevent Neural Networks from Overfitting. *Journal of Machine Learning Research*, 15(56), 1929–1958. <http://jmlr.org/papers/v15/srivastava14a.html>
- Stoev, T., Suravee, S., & Yordanova, K. (2024). Variability of annotations over time: An experimental study in the dementia-related named entity recognition domain. *Lecture Notes in Informatics (LNI), Proceedings - Series of the Gesellschaft für Informatik (GI)*, 352, 473–486. https://doi.org/10.18420/INF2024_35
- Sujon, K. M., Hassan, R., Choi, K., & Samad, M. A. (2025). Accuracy, precision, recall, f1-score, or MCC? empirical evidence from advanced statistics, ML, and XAI for evaluating business predictive models. *Journal of Big Data* 2025 12:1, 12(1), 268-. <https://doi.org/10.1186/S40537-025-01313-4>
- Teng, J., Kong, W., Chang, Y., Tian, Q., Shi, C., & Li, L. (2021). Text Classification Method Based on BiGRU-Attention and CNN Hybrid Model. *ACM International Conference Proceeding Series*, 614–622. <https://doi.org/10.1145/3488933.3488970>
- Tharwat, A. (2021). Classification assessment methods. *Applied Computing and Informatics*, 17(1), 168–192. <https://doi.org/10.1016/J.ACI.2018.08.003>
- Todorović, A., Batanović, V., & Bajčetić, L. (2025). A Comparison of Named Entity Recognition Evaluation Frameworks. *Proceedings - 12th International Conference on Electrical, Electronic and Computing Engineering, IcETRAN 2025*. <https://doi.org/10.1109/ICETRAN66854.2025.11114116>
- Tong, B., Pan, J., Zheng, L., & Wang, L. (2021). Research on Named Entity Recognition Based on Bert-BiGRU-CRF model in Spacecraft Field. *2021 IEEE International Conference on Computer Science, Electronic Information Engineering and Intelligent Control Technology, CEI 2021*, 747–753. <https://doi.org/10.1109/CEI52496.2021.9574470>
- Torres, A. E., de Moura, E. S., da Silva, A. S., Nascimento, M. A., & Mesquita, F. (2024). An Experimental Study on Data Augmentation Techniques for Named Entity Recognition on Low-Resource Domains. *Natural Language Processing*. <https://doi.org/10.1017/nlp.2026.10019>
- United Nations. (2015). *THE 17 GOALS | Sustainable Development*. <https://sdgs.un.org/goals>
- Uzuner, Ö. (2010). *2010 i2b2 / VA Challenge Evaluation*.

- Uzuner, Ö., Solti, I., & Cadag, E. (2010). Extracting medication information from clinical text. *Journal of the American Medical Informatics Association : JAMIA*, 17(5), 514. <https://doi.org/10.1136/JAMIA.2010.003947>
- Vaswani, A., Brain, G., Shazeer, N., Parmar, N., Uszkoreit, J., Jones, L., Gomez, A. N., Kaiser, Ł., & Polosukhin, I. (2017). Attention is All you Need. *Advances in Neural Information Processing Systems*, 30.
- Wang, Y., Tong, H., Zhu, Z., & Li, Y. (2022). Nested Named Entity Recognition: A Survey. *ACM Transactions on Knowledge Discovery from Data*, 16(6). <https://doi.org/10.1145/3522593;ISSUE:ISSUE:DOI>
- Widyaningsih, V., Mohanty, I., Mulyaningsih, T., Gebremedhin, T. A., Miranti, R., Zaen, N. A., Nugroho, S. D., Azmiardi, A., & Probandari, A. (2025). Exploring the Multilevel Determinants of Suboptimal Maternal and Child Continuum of Care in Indonesia. *Maternal and Child Health Journal* 2025 29:7, 29(7), 919–931. <https://doi.org/10.1007/S10995-025-04110-W>
- Wilie, B., Vincentio, K., Winata, G. I., Cahyawijaya, S., Li, X., Lim, Z. Y., Soleman, S., Mahendra, R., Fung, P., Bahar, S., & Purwarianti, A. (2020). IndoNLU: Benchmark and Resources for Evaluating Indonesian Natural Language Understanding. *Proceedings of the 1st Conference of the Asia-Pacific Chapter of the Association for Computational Linguistics and the 10th International Joint Conference on Natural Language Processing, AACL-IJCNLP 2020*, 843–857. <https://doi.org/10.18653/V1/2020.AACL-MAIN.85>
- Yang, S., Yu, X., & Zhou, Y. (2020). LSTM and GRU Neural Network Performance Comparison Study: Taking Yelp Review Dataset as an Example. *Proceedings - 2020 International Workshop on Electronic Communication and Artificial Intelligence, IWECAI 2020*, 98–101. <https://doi.org/10.1109/IWECAI50956.2020.00027>
- Zadeh Nojoo Kambar, M. E., Esmaeilzadeh, A., & Heidari, M. (2022). A Survey on Deep Learning Techniques for Joint Named Entities and Relation Extraction. *2022 IEEE World AI IoT Congress, AIIoT 2022*, 218–224. <https://doi.org/10.1109/AIIOT54504.2022.9817231>
- Zhao, D., Chen, X., & Chen, Y. (2024). Named Entity Recognition for Chinese Texts on Marine Coral Reef Ecosystems Based on the BERT-BiGRU-Att-CRF Model. *Applied Sciences* 2024, Vol. 14, Page 5743, 14(13), 5743. <https://doi.org/10.3390/APP14135743>