

DAFTAR PUSTAKA

- [1] Y. Petriv, R. Erlenheim, V. Tsap, I. Pappel, and D. Draheim, "Designing Effective Chatbot Solutions for the Public Sector: A Case Study from Ukraine," in *Electronic Governance and Open Society: Challenges in Eurasia*, 2020, pp. 320–335.
- [2] P.-H. Li, T.-J. Fu, and W.-Y. Ma, "Why Attention? Analyze BiLSTM Deficiency and Its Remedies in the Case of NER," 2019.
- [3] S. Kamath and R. Wagh, "Named Entity Recognition Approaches and Challenges," *Int. J. Adv. Res. Comput. Commun. Eng. ISO*, vol. 3297, no. 2, 2007.
- [4] J. Devlin, M.-W. Chang, K. Lee, and K. Toutanova, "BERT: Pre-training of Deep *Bidirectional* Transformers for Language Understanding," *CoRR*, vol. abs/1810.0, 2018.
- [5] H. Permana, K. K. Purnamasari, J. Dipati, U. No, K. Bandung, and J. Barat, "NAMED ENTITY RECOGNITION MENGGUNAKAN METODE *BIDIRECTIONAL* LSTM-CRF PADA TEKS BAHASA INDONESIA," no. 112.
- [6] J. P. C. Chiu and E. Nichols, "Named Entity Recognition with *Bidirectional* LSTM-CNNs," *Trans. Assoc. Comput. Linguist.*, vol. 4, no. 2003, pp. 357–370, 2016.
- [7] Z. Huang, W. Xu, and K. Yu, "*Bidirectional* LSTM-CRF Models for Sequence Tagging," 2015.
- [8] T. A. Le, M. Y. Arkhipov, and M. S. Burtsev, "Application of a hybrid Bi-LSTM-CRF Model to the task of Russian named entity recognition," *Commun. Comput. Inf. Sci.*, vol. 789, pp. 91–103, 2018.
- [9] W. Gunawan, D. Suhartono, F. Purnomo, and A. Ongko, "Named-Entity Recognition for Indonesian Language using *Bidirectional* LSTM-CNNs," *Procedia Comput. Sci.*, vol. 135, pp. 425–432, 2018.
- [10] J. Devlin, M.-W. Chang, K. Lee, and K. Toutanova, "BERT: Pre-training of Deep *Bidirectional* Transformers for Language Understanding," no. Mlm, 2018.
- [11] A. Baumann, "Multilingual Language Models for Named Entity Recognition in German and English," pp. 21–27, 2019.
- [12] C. Sun and Z. Yang, "Transfer Learning in Biomedical Named Entity

Recognition: An Evaluation of BERT in the PharmaCoNER task,” pp. 100–104, 2019.

- [13] D. C. Wintaka, M. A. Bijaksana, and I. Asror, “Named-entity recognition on Indonesian tweets using *Bidirectional* LSTM-CRF,” *Procedia Comput. Sci.*, vol. 157, pp. 221–228, 2019.
- [14] Y. Wang, Y. Sun, Z. Ma, L. Gao, Y. Xu, and T. Sun, “Application of Pre-training Models in Named Entity Recognition,” 2020.
- [15] J. P. C. Chiu and E. Nichols, “Named Entity Recognition with *Bidirectional* LSTM-CNNs,” *Trans. Assoc. Comput. Linguist.*, vol. 4, pp. 357–370, 2016.
- [16] Z. Huang, W. Xu, and K. Yu, “*Bidirectional* LSTM-CRF Models for Sequence Tagging,” *CoRR*, vol. abs/1508.0, 2015.
- [17] A. Passos, V. Kumar, and A. McCallum, “Lexicon Infused Phrase Embeddings for Named Entity Resolution,” in *Proceedings of the Eighteenth Conference on Computational Natural Language Learning*, 2014, pp. 78–86.
- [18] A. Baumann, “Multilingual Language Models for Named Entity Recognition in German and English,” in *Proceedings of the Student Research Workshop Associated with RANLP 2019*, 2019, pp. 21–27.
- [19] J. Howard and S. Ruder, “Fine-tuned Language Models for Text Classification,” *CoRR*, vol. abs/1801.0, 2018.
- [20] Y. Wang, Y. Sun, Z. Ma, L. Gao, Y. Xu, and T. Sun, “Application of Pre-training Models in Named Entity Recognition.” 2020.
- [21] Y. Sun *et al.*, “ERNIE: Enhanced Representation through Knowledge Integration,” *CoRR*, vol. abs/1904.0, 2019.
- [22] Y. Sun *et al.*, “ERNIE 2.0: A Continual Pre-training Framework for Language Understanding,” *CoRR*, vol. abs/1907.1, 2019.
- [23] Y. Liu *et al.*, “RoBERTa: A Robustly Optimized BERT Pretraining Approach,” *CoRR*, vol. abs/1907.1, 2019.
- [24] W. Gunawan, D. Suhartono, F. Purnomo, and A. Ongko, “Named-Entity Recognition for Indonesian Language using *Bidirectional* LSTM-CNNs,” *Procedia Comput. Sci.*, vol. 135, pp. 425–432, 2018.
- [25] D. C. Wintaka, M. A. Bijaksana, and I. Asror, “Named-Entity Recognition on Indonesian Tweets using *Bidirectional* LSTM-CRF,” *Procedia Comput. Sci.*, vol. 157, pp. 221–228, 2019.

- [26] H. Permana, "Named Entity Recognition Menggunakan Metode *Bidirectional Lstm-Crf* Pada Teks Bahasa Indonesia," *Univ. Komput. Indones.*, 2019.
- [27] J. Zagal, N. Tomuro, and A. Shepitsen, "Natural Language Processing in Game Studies Research An Overview," *Simul. Gaming*, vol. 43, pp. 356–373, 2012.
- [28] W. Daelemans and A. den Bosch, "Memory-based language processing," in *Journal of Chinese Linguistics*, vol. 11, 1999.
- [29] E. D. Liddy, *Natural Language Processing*. 2001.
- [30] Y. Bengio, R. Ducharme, P. Vincent, and C. Janvin, "A Neural Probabilistic Language Model," *J. Mach. Learn. Res.*, vol. 3, no. null, pp. 1137–1155, Mar. 2003.
- [31] J. Lafferty, A. McCallum, and F. Pereira, "Conditional Random Fields: Probabilistic Models for Segmenting and Labeling Sequence Data," in *Proceedings of the Eighteenth International Conference on Machine Learning*, 2001, pp. 282–289.
- [32] D. M. Blei, A. Y. Ng, and M. I. Jordan, "Latent Dirichlet Allocation," *J. Mach. Learn. Res.*, vol. 3, no. null, pp. 993–1022, Mar. 2003.
- [33] D. Ramage, D. Hall, R. Nallapati, and C. D. Manning, "Labeled LDA: A supervised topic model for credit attribution in multi-labeled corpora," in *Proceedings of the 2009 Conference on Empirical Methods in Natural Language Processing*, 2009, pp. 248–256.
- [34] Y. Wang, H. Bai, M. Stanton, W.-Y. Chen, and E. Y. Chang, "PLDA: Parallel Latent Dirichlet Allocation for Large-Scale Applications," in *Algorithmic Aspects in Information and Management*, 2009, pp. 301–314.
- [35] T. Mikolov, K. Chen, G. Corrado, and J. Dean, "Efficient Estimation of Word Representations in Vector Space." 2013.
- [36] I. Sutskever, O. Vinyals, and Q. V Le, "Sequence to Sequence Learning with Neural Networks," in *Advances in Neural Information Processing Systems 27*, Z. Ghahramani, M. Welling, C. Cortes, N. D. Lawrence, and K. Q. Weinberger, Eds. Curran Associates, Inc., 2014, pp. 3104–3112.
- [37] Y. Wu *et al.*, "Google's Neural Machine Translation System: Bridging the Gap between Human and Machine Translation," *CoRR*, vol. abs/1609.0, 2016.
- [38] O. Vinyals, A. Toshev, S. Bengio, and D. Erhan, "Show and Tell: A Neural Image Caption Generator," *CoRR*, vol. abs/1411.4, 2014.

- [39] R. Lebrete, D. Grangier, and M. Auli, "Generating Text from Structured Data with Application to the Biography Domain," *CoRR*, vol. abs/1603.0, 2016.
- [40] P. Loyola, E. Marrese-Taylor, and Y. Matsuo, "A Neural Architecture for Generating Natural Language Descriptions from Source Code Changes," *CoRR*, vol. abs/1704.0, 2017.
- [41] D. Bahdanau, K. Cho, and Y. Bengio, "Neural Machine Translation by Jointly Learning to Align and Translate," *ArXiv*, vol. 1409, 2014.
- [42] A. Vaswani *et al.*, "Attention is All you Need," in *Advances in Neural Information Processing Systems 30*, I. Guyon, U. V Luxburg, S. Bengio, H. Wallach, R. Fergus, S. Vishwanathan, and R. Garnett, Eds. Curran Associates, Inc., 2017, pp. 5998–6008.
- [43] P. Ramachandran, P. Liu, and Q. Le, "Unsupervised Pretraining for Sequence to Sequence Learning," in *Proceedings of the 2017 Conference on Empirical Methods in Natural Language Processing*, 2017, pp. 383–391.
- [44] S. Raj, *Building Chatbots with Python*. Berkeley: Apress, 2019.
- [45] R. Feldman, Ronen, Sanger, and James, *The text mining handbook: Advanced approaches in analyzing unstructured data*. 2007.
- [46] J. J. Hopfield, "Neural networks and physical systems with emergent collective computational abilities," *Proc. Natl. Acad. Sci.*, vol. 79, no. 8, pp. 2554–2558, 1982.
- [47] D. E. Rumelhart, G. E. Hinton, and R. J. Williams, "Learning representations by back-propagating errors," *Nature*, vol. 323, no. 6088, pp. 533–536, 1986.
- [48] J. Li, A. Sun, J. Han, and C. Li, "A Survey on Deep Learning for Named Entity Recognition," *CoRR*, vol. abs/1812.0, 2018.
- [49] S. Hochreiter and J. Schmidhuber, "Long short-term memory," *Neural Comput.*, vol. 9, no. 8, pp. 1735–1780, 1997.
- [50] F. A. Gers, J. Schmidhuber, and F. Cummins, "Learning to forget: continual prediction with LSTM," in *1999 Ninth International Conference on Artificial Neural Networks ICANN 99. (Conf. Publ. No. 470)*, 1999, vol. 2, pp. 850–855 vol.2.
- [51] K. Greff, R. K. Srivastava, J. Koutník, B. R. Steunebrink, and J. Schmidhuber, "LSTM: A Search Space Odyssey," *CoRR*, vol. abs/1503.0, 2015.

- [52] M. Schuster and K. Paliwal, “*Bidirectional* recurrent neural networks,” *Signal Process. IEEE Trans.*, vol. 45, pp. 2673–2681, 1997.
- [53] M. McTear, Z. Callejas, and D. Griol, *The Conversational Interface: Talking to Smart Devices*, 1st ed. Springer Publishing Company, Incorporated, 2016.
- [54] K. Sparck Jones, “A Statistical Interpretation of Term Specificity and Its Application in Retrieval,” in *Document Retrieval Systems*, GBR: Taylor Graham Publishing, 1988, pp. 132–142.
- [55] J. Pennington, R. Socher, and C. Manning, “Glove: Global Vectors for Word Representation,” in *Proceedings of the 2014 Conference on Empirical Methods in Natural Language Processing ({EMNLP})*, 2014, pp. 1532–1543.
- [56] J. Deng, W. Dong, R. Socher, L. Li, Kai Li, and Li Fei-Fei, “ImageNet: A large-scale hierarchical image database,” in *2009 IEEE Conference on Computer Vision and Pattern Recognition*, 2009, pp. 248–255.
- [57] M. E. Peters *et al.*, “Deep contextualized word representations,” *CoRR*, vol. abs/1802.0, 2018.
- [58] A. M. Dai and Q. V Le, “Semi-supervised Sequence Learning,” in *Advances in Neural Information Processing Systems 28*, C. Cortes, N. D. Lawrence, D. D. Lee, M. Sugiyama, and R. Garnett, Eds. Curran Associates, Inc., 2015, pp. 3079–3087.
- [59] S. Merity, N. S. Keskar, and R. Socher, “Regularizing and Optimizing LSTM Language Models,” *CoRR*, vol. abs/1708.0, 2017.
- [60] D. H. Ballard, “Modular Learning in Neural Networks,” in *Proceedings of the Sixth National Conference on Artificial Intelligence - Volume 1*, 1987, pp. 279–284.
- [61] K. He, X. Zhang, S. Ren, and J. Sun, “Deep Residual Learning for Image Recognition,” *CoRR*, vol. abs/1512.0, 2015.