

Literaturverzeichnis

- Ahmad, M., Aftab, S. & Ali, I. (2017). Sentiment analysis of tweets using svm. *Int. J. Comput. Appl.*, 177 (5), 25–29.
- Ahmad, M., Aftab, S., Bashir, M. S., Hameed, N., Ali, I. & Nawaz, Z. (2018). Svm optimization for sentiment analysis. *Int. J. Adv. Comput. Sci. Appl.*, 9 (4), 393–398.
- Alam, S. & Yao, N. (2019). The impact of preprocessing steps on the accuracy of machine learning algorithms in sentiment analysis. *Computational and Mathematical Organization Theory*, 25 (3), 319–335.
- Alamoodi, A. H., Zaidan, B. B., Zaidan, A. A., Albahri, O. S., Mohammed, K., Malik, R. Q., ... others (2021). Sentiment analysis and its applications in fighting covid-19 and infectious diseases: A systematic review. *Expert systems with applications*, 167, 114155.
- Alaparthi, S. & Mishra, M. (2020). Bidirectional encoder representations from transformers (bert): A sentiment analysis odyssey. *arXiv preprint arXiv:2007.01127*.
- Alessia, D., Ferri, F., Grifoni, P. & Guzzo, T. (2015). Approaches, tools and applications for sentiment analysis implementation. *International Journal of Computer Applications*, 125 (3).
- Arras, L., Montavon, G., Müller, K.-R. & Samek, W. (2017). Explaining recurrent neural network predictions in sentiment analysis. *arXiv preprint arXiv:1706.07206*.
- Asghar, M. Z., Khan, A., Ahmad, S. & Kundi, F. M. (2014). A review of feature extraction in sentiment analysis. *Journal of Basic and Applied Scientific Research*, 4 (3), 181–186.
- Awad, M., Khanna, R., Awad, M. & Khanna, R. (2015). Support vector machines for classification. *Efficient Learning Machines: Theories, Concepts, and Applications for Engineers and System Designers*, 39–66.
- Baktha, K. & Tripathy, B. (2017). Investigation of recurrent neural networks in the field of sentiment analysis. In *2017 international conference on communication and signal processing (iccsp)* (S. 2047–2050).
- Balahur, A., Hermida, J. M. & Montoyo, A. (2012). Detecting implicit expressions of emotion in text: A comparative analysis. *Decision support systems*, 53 (4), 742–753.

- Balazs, J. A. & Velásquez, J. D. (2016). Opinion mining and information fusion: a survey. *Information Fusion*, 27, 95–110.
- Basarslan, M. S., Kayaalp, F. et al. (2020). *Sentiment analysis with machine learning methods on social media*. Ediciones Universidad de Salamanca (España).
- Berrar, D. (2019). *Cross-validation*.
- Bird, S., Klein, E. & Loper, E. (2009). *Natural language processing with python: analyzing text with the natural language toolkit*. O’Reilly Media Inc.
- Bütow, F., Lommatzsch, A. & Ploch, D. (2016). Creation of a german corpus for internet news sentiment analysis. *Project report, Berlin Institute of Technology, AOT*.
- Chan, B., Schweter, S. & Möller, T. (2020). German’s next language model. arxiv 2020. *arXiv preprint arXiv:2010.10906*.
- Chollet, F. (2018). *Deep learning mit python und keras: das praxis-handbuch vom entwickler der keras-bibliothek*. MITP-Verlags GmbH & Co. KG.
- Cieliebak, M., Deriu, J. M., Egger, D. & Uzdilli, F. (2017). A twitter corpus and benchmark resources for german sentiment analysis. In *5th international workshop on natural language processing for social media, boston ma, usa, 11 december 2017* (S. 45–51).
- Clark, K., Luong, M.-T., Le, Q. V. & Manning, C. D. (2020). Electra: Pre-training text encoders as discriminators rather than generators. *arXiv preprint arXiv:2003.10555*.
- Clematide, S., Gindl, S., Klenner, M., Petrakis, S., Remus, R., Ruppenhofer, J., ... Wiegand, M. (2012). *Mlsa—a multi-layered reference corpus for german sentiment analysis*. University of Zurich.
- Dashtipour, K., Poria, S., Hussain, A., Cambria, E., Hawalah, A. Y., Gelbukh, A. & Zhou, Q. (2016). Multilingual sentiment analysis: state of the art and independent comparison of techniques. *Cognitive computation*, 8, 757–771.
- Denecke, K. (2008). Using sentiwordnet for multilingual sentiment analysis. In *2008 ieee 24th international conference on data engineering workshop* (S. 507-512). doi: 10.1109/ICDEW.2008.4498370
- Devlin, J., Chang, M.-W., Lee, K. & Toutanova, K. (2019). Bert: Pre-training of deep bidirectional transformers for language understanding. *arXiv preprint arXiv:1810.04805*.

- Dey, L., Chakraborty, S., Biswas, A., Bose, B. & Tiwari, S. (2016). Sentiment analysis of review datasets using naive bayes and k-nn classifier. *arXiv preprint arXiv:1610.09982*.
- Dos Santos, C. & Gatti, M. (2014). Deep convolutional neural networks for sentiment analysis of short texts. In *Proceedings of coling 2014, the 25th international conference on computational linguistics: technical papers* (S. 69–78).
- Du, K. & Mellmann, K. (2019). *Sentimentanalyse als instrument literaturgeschichtlicher rezeptionsforschung: Ein pilotprojek*. Niedersächsische Staats-und Universitätsbibliothek Göttingen.
- Fehle, J., Schmidt, T. & Wolff, C. (2021). *Lexicon-based sentiment analysis in german: Systematic evaluation of resources and preprocessing techniques*. KONVENS 2021 Organizers.
- Ghosh, M. & Sanyal, G. (2017). Preprocessing and feature selection approach for efficient sentiment analysis on product reviews. In *Proceedings of the 5th international conference on frontiers in intelligent computing: Theory and applications* (S. 721–730).
- Gonçalves, P., Araújo, M., Benevenuto, F. & Cha, M. (2013). Comparing and combining sentiment analysis methods. In *Proceedings of the first acm conference on online social networks* (S. 27–38).
- Guhr, O., Schumann, A.-K., Bahrmann, F. & Böhme, H. J. (2020). Training a broad-coverage german sentiment classification model for dialog systems. In *Proceedings of the 12th language resources and evaluation conference* (S. 1627–1632).
- Habimana, O., Li, Y., Li, R., Gu, X. & Yu, G. (2020). Sentiment analysis using deep learning approaches: an overview. *Science China Information Sciences*, 63, 1–36.
- Haddi, E., Liu, X. & Shi, Y. (2013). The role of text pre-processing in sentiment analysis. *Procedia computer science*, 17, 26–32.
- Hemalatha, I., Varma, G. S. & Govardhan, A. (2012). Preprocessing the informal text for efficient sentiment analysis. *International Journal of Emerging Trends & Technology in Computer Science (IJETTCS)*, 1 (2), 58–61.
- Hogenboom, A., Bal, D., Frasinca, F., Bal, M., de Jong, F. & Kaymak, U. (2013). Exploiting emoticons in sentiment analysis. In *Proceedings of the 28th annual acm symposium on applied computing* (S. 703–710).
- Idrissi-Yaghir, A., Schäfer, H., Bauer, N. & Friedrich, C. M. (2023). Domain adaptation of transformer-based models using unlabeled data for relevance and polarity classification of german customer feedback. *SN Computer Science*, 4 (2), 142.

- Jivani, A. G. et al. (2011). A comparative study of stemming algorithms. *Int. J. Comp. Tech. Appl*, 2 (6), 1930–1938.
- Jurafsky, D. & Martin, J. H. (2022). *Speech and language processing: An introduction to natural language processing, computational linguistics, and speech recognition*.
- Kang, H., Yoo, S. J. & Han, D. (2012). Senti-lexicon and improved naïve bayes algorithms for sentiment analysis of restaurant reviews. *Expert Systems with Applications*, 39 (5), 6000–6010. Zugriff auf <https://www.sciencedirect.com/science/article/pii/S0957417411016538> doi:<https://doi.org/10.1016/j.eswa.2011.11.107>
- Kim, K. (2018). An improved semi-supervised dimensionality reduction using feature weighting: Application to sentiment analysis. *Expert Systems with Applications*, 109, 49–65.
- Klinger, R. & Cimiano, P. (2014). The usage review corpus for fine grained multi lingual opinion analysis. In *Proceedings of the ninth international conference on language resources and evaluation (lrec'14)* (S. 2211–2218).
- Krouska, A., Troussas, C. & Virvou, M. (2016). The effect of preprocessing techniques on twitter sentiment analysis. In *2016 7th international conference on information, intelligence, systems & applications (iisa)* (S. 1–5).
- Liao, S., Wang, J., Yu, R., Sato, K. & Cheng, Z. (2017). Cnn for situations understanding based on sentiment analysis of twitter data. *Procedia computer science*, 111, 376–381.
- Liu, B. (2012). Sentiment analysis and opinion mining. *Synthesis lectures on human language technologies*, 5 (1), 1–167.
- Lo, S. L., Cambria, E., Chiong, R. & Cornforth, D. (2017). Multilingual sentiment analysis: from formal to informal and scarce resource languages. *Artificial Intelligence Review*, 48, 499–527.
- Luhn, H. P. (1958). The automatic creation of literature abstracts. *IBM Journal of research and development*, 2 (2), 159–165.
- Mathew, L. & Bindu, V. (2020). A review of natural language processing techniques for sentiment analysis using pre-trained models. In *2020 fourth international conference on computing methodologies and communication (iccm)* (S. 340–345).
- McKinney, W. et al. (2010). Data structures for statistical computing in python. In *Proceedings of the 9th python in science conference* (Bd. 445, S. 51–56).

- Mishev, K., Gjorgjevikj, A., Vodenska, I., Chitkushev, L. T. & Trajanov, D. (2020). Evaluation of sentiment analysis in finance: From lexicons to transformers. *IEEE Access*, 8, 131662-131682. doi: 10.1109/ACCESS.2020.3009626
- Momtazi, S. (2012). Fine-grained german sentiment analysis on social media. In *Proceedings of the eighth international conference on language resources and evaluation (lrec'12)* (S. 1215–1220).
- Monika, R., Deivalakshmi, S. & Janet, B. (2019). Sentiment analysis of us airlines tweets using lstm/rnn. In *2019 ieee 9th international conference on advanced computing (iacc)* (S. 92–95).
- Mozetič, I., Grčar, M. & Smailović, J. (2016). Multilingual twitter sentiment classification: The role of human annotators. *PloS one*, 11 (5), e0155036.
- Nair, A. J., Veena, G. & Vinayak, A. (2021). Comparative study of twitter sentiment on covid-19 tweets. In *2021 5th international conference on computing methodologies and communication (iccmcc)* (S. 1773–1778).
- Narr, S., Hulphenhaus, M. & Albayrak, S. (2012). Language-independent twitter sentiment analysis. *Knowledge discovery and machine learning (KDML), LWA*, 12–14.
- Oliphant, T. E. et al. (2006). *A guide to numpy* (Bd. 1). Trelgol Publishing USA.
- Parveen, H. & Pandey, S. (2016). Sentiment analysis on twitter data-set using naive bayes algorithm. In *2016 2nd international conference on applied and theoretical computing and communication technology (icatcct)* (S. 416–419).
- Pawar, A. B., Jawale, M. & Kyatanavar, D. (2016). Fundamentals of sentiment analysis: concepts and methodology. *Sentiment analysis and ontology engineering: An environment of computational intelligence*, 25–48.
- Pedregosa, F., Varoquaux, G., Gramfort, A., Michel, V., Thirion, B., Grisel, O., ... others (2011). Scikit-learn: Machine learning in python. *the Journal of machine Learning research*, 12, 2825–2830.
- Ploch, D. (2015). Intelligent news aggregator for german with sentiment analysis. In *Smart information systems* (S. 5–46). Springer.
- Prabowo, R. & Thelwall, M. (2009). Sentiment analysis: A combined approach. *Journal of Informetrics*, 3 (2), 143–157.
- Prettenhofer, P. & Stein, B. (2010). Cross-language text classification using structural correspondence learning. In *Proceedings of the 48th annual meeting of the association for computational linguistics* (S. 1118–1127).

- Rajapakse, T., Raab, M., Franc, L. H., Carbin, M. A. & Sachan, D. S. (2019-2022). *Simple transformers: A high-level library for state-of-the-art nlp*. <https://github.com/ThilinaRajapakse/simpletransformers>. (Abgerufen am 5.02.2023)
- Raschka, S. (2014). Naive bayes and text classification i-introduction and theory. *arXiv preprint arXiv:1410.5329*.
- Rauh, C. (2018). Validating a sentiment dictionary for german political language—a workbench note. *Journal of Information Technology & Politics*, 15 (4), 319–343.
- Sänger, M., Leser, U., Kemmerer, S., Adolphs, P. & Klinger, R. (2016). Scare—the sentiment corpus of app reviews with fine-grained annotations in german. In *Proceedings of the tenth international conference on language resources and evaluation (lrec'16)* (S. 1114–1121).
- Schabus, D., Skowron, M. & Trapp, M. (2017). One million posts: A data set of german online discussions. In *Proceedings of the 40th international acm sigir conference on research and development in information retrieval* (S. 1241–1244).
- Schmidt, T., Burghardt, M. & Dennerlein, K. (2018). *Sentiment annotation of historic german plays: An empirical study on annotation behavior*. RWTH Aachen.
- Schmidt, T., Burghardt, M., Dennerlein, K. & Wolff, C. (2019). *Sentiment annotation for lessing's plays: Towards a language resource for sentiment analysis on german literary texts*. RWTH Aachen.
- Schmidt, T., Dennerlein, K. & Wolff, C. (2021). Emotion classification in german plays with transformer-based language models pretrained on historical and contemporary language..
- Schmidt, T., Fehle, J., Weissenbacher, M., Richter, J., Gottschalk, P. & Wolff, C. (2022, 12–15 September). Sentiment analysis on Twitter for the major German parties during the 2021 German federal election. In *Proceedings of the 18th conference on natural language processing (konvens 2022)* (S. 74–87). Potsdam, Germany: KONVENS 2022 Organizers. Zugriff auf <https://aclanthology.org/2022.konvens-1.9>
- Schumaker, R. P., Zhang, Y., Huang, C.-N. & Chen, H. (2012). Evaluating sentiment in financial news articles. *Decision Support Systems*, 53 (3), 458–464.
- Sidarenka, U. (2016). Potts: the potsdam twitter sentiment corpus. In *Proceedings of the tenth international conference on language resources and evaluation (lrec'16)* (S. 1133–1141).

- Sidarenka, U. (2019). *Sentiment analysis of german twitter* (Dissertation). doi: 10.25932/PUBLISHUP-43742
- Siegel, M., Emig, K., ihringer, N., Kesim, S. & Yilmaz, T. (2017). Github repository: Sentiment analysis. ressources for sentiment analysis of german language..
- Singh, J. & Gupta, V. (2016). Text stemming: Approaches, applications, and challenges. *ACM Computing Surveys (CSUR)*, 49 (3), 1–46.
- Tang, H., Tan, S. & Cheng, X. (2009). A survey on sentiment detection of reviews. *Expert Systems with Applications*, 36 (7), 10760–10773.
- Trueman, T. E., Jayaraman, A. K., Ananthakrishnan, G., Cambria, E. & Mitra, S. (2022). *An n-gram-based bert model for sentiment classification using movie reviews*.
- Vaswani, A., Shazeer, N., Parmar, N., Uszkoreit, J., Jones, L., Gomez, A. N., ... Polosukhin, I. (2017). Attention is all you need. *Advances in neural information processing systems*, 30.
- Vijayarani, S., Ilamathi, M. J., Nithya, M. et al. (2015). Preprocessing techniques for text mining-an overview. *International Journal of Computer Science & Communication Networks*, 5 (1), 7–16.
- Wang, H. & Castanon, J. A. (2015). Sentiment expression via emoticons on social media. In *2015 ieee international conference on big data (big data)* (S. 2404–2408).
- Wojatzki, M., Ruppert, E., Holschneider, S., Zesch, T. & Biemann, C. (2017). GermEval 2017: Shared task on aspect-based sentiment in social media customer feedback. *Proceedings of the GermEval*, 1–12.
- Wunderlich, F. & Memmert, D. (2020). Innovative approaches in sports science—lexicon-based sentiment analysis as a tool to analyze sports-related twitter communication. *Applied Sciences*, 10 (2). Zugriff auf <https://www.mdpi.com/2076-3417/10/2/431> doi: 10.3390/app10020431
- Yadav, P. & Pandya, D. (2017). Sentireview: Sentiment analysis based on text and emoticons. In *2017 international conference on innovative mechanisms for industry applications (icimia)* (S. 467–472).
- Yue, L., Chen, W., Li, X., Zuo, W. & Yin, M. (2019). A survey of sentiment analysis in social media. *Knowledge and Information Systems*, 60, 617–663.
- Zainuddin, N. & Selamat, A. (2014). Sentiment analysis using support vector machine. In *2014 international conference on computer, communications, and control technology (i4ct)* (S. 333–337).

- Zehe, A., Becker, M., Jannidis, F. & Hotho, A. (2017). Towards sentiment analysis on german literature. In *Joint german/austrian conference on artificial intelligence (künstliche intelligenz)* (S. 387–394).
- Zhang, H., Gan, W. & Jiang, B. (2014). Machine learning and lexicon based methods for sentiment classification: A survey. In *2014 11th web information system and application conference* (S. 262–265).
- Zhang, L., Wang, S. & Liu, B. (2018). Deep learning for sentiment analysis: A survey. *Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery*, 8 (4), e1253.
- Zuo, Z. (2018). *Sentiment analysis of steam review datasets using naïve bayes and decision tree classifier*.
- Çevikel, S. (2018). *emoji*. Zugriff auf <https://pypi.org/project/emoji/> (Abgerufen am 5.02.2023)