

REFERENCES

- [1] D. Zhang, M. Hu, and Q. Ji, “Financial markets under the global pandemic of COVID-19,” *Finance Research Letters*, vol. 36, p. 101528, Oct. 2020, doi: [10.1016/j.frl.2020.101528](https://doi.org/10.1016/j.frl.2020.101528).
- [2] W. Jiang, “Applications of deep learning in stock market prediction: Recent progress,” *Expert Systems with Applications*, vol. 184, p. 115537, Dec. 2021, doi: [10.1016/j.eswa.2021.115537](https://doi.org/10.1016/j.eswa.2021.115537).
- [3] A. Phuyal, A. Pokharel, N. Dahal, and S. Shrestha, “Analysis of Stock Market using Data Mining Techniques,” *Journal of Network Security and Data Mining*, vol. 4, no. 2, Art. no. 2, Jul. 2021, Accessed: Mar. 29, 2022. [Online]. Available: <http://hbrppublication.com/OJS/index.php/JNSDM/article/view/1926>
- [4] E. Endri, M. Rinaldi, D. Arifian, B. Saing, and A. Aminudin, “Oil Price and Stock Return: Evidence of Mining Companies in Indonesia,” *International Journal of Energy Economics and Policy*, vol. 11, pp. 110–114, Feb. 2021, doi: [10.32479/ijeep.10608](https://doi.org/10.32479/ijeep.10608).
- [5] “A Statistical Analysis of Impact of COVID19 on the Global Economy and Stock Index Returns | SpringerLink.” <https://link.springer.com/article/10.1007/s42979-020-00410-w> (accessed Mar. 29, 2022).
- [6] D. Kumar, P. K. Sarangi, and R. Verma, “A systematic review of stock market prediction using machine learning and statistical techniques,” *Materials Today: Proceedings*, vol. 49, pp. 3187–3191, Jan. 2022, doi: [10.1016/j.matpr.2020.11.399](https://doi.org/10.1016/j.matpr.2020.11.399).
- [7] “Reliance on Artificial Intelligence, Machine Learning and Deep Learning in the Era of Industry 4.0 - Smart Healthcare System Design - Wiley Online Library.” <https://onlinelibrary.wiley.com/doi/abs/10.1002/9781119792253.ch12> (accessed Mar. 29, 2022).
- [8] P. K. Tiwari, A. Kumar, S. S. Malladi, P. Nuney, and V. K. Verma, “Stock Market Prediction Techniques: A Systematic Review and Taxonomy,” *SPAST Abstracts*, vol. 1, no. 01, Art. no. 01, Oct. 2021, Accessed: Mar. 29, 2022. [Online]. Available: <https://spast.org/techrep/article/view/2441>
- [9] “Stock Market Prediction Using RNN LSTM | IEEE Conference Publication | IEEE Xplore.” <https://ieeexplore.ieee.org/abstract/document/9587540/> (accessed Mar. 29, 2022).
- [10] I. K. Nti, A. F. Adekoya, and B. A. Weyori, “A systematic review of fundamental and technical analysis of stock market predictions,” *Artif Intell Rev*, vol. 53, no. 4, pp. 3007–3057, Apr. 2020, doi: [10.1007/s10462-019-09754-z](https://doi.org/10.1007/s10462-019-09754-z).
- [11] “Fundamental Analysis of Share Prices in Coal Mining Subsector Companies | Rahayu | Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences.” <https://www.bircu-journal.com/index.php/birci/article/view/2371> (accessed Mar. 29, 2022).
- [12] R. Dash, P. K. Dash, and R. Bisoi, “A self adaptive differential harmony search based Optimized extreme learning machine for financial time series prediction,” *Swarm and Evolutionary Computation*, vol. 19, Aug. 2014, doi: [10.1016/j.swevo.2014.07.003](https://doi.org/10.1016/j.swevo.2014.07.003).

- [13] M. Ballings, D. Van den Poel, N. Hespeels, and R. Gryp, “Evaluating multiple classifiers for stock price direction prediction,” *Expert Systems with Applications*, vol. 42, no. 20, pp. 7046–7056, Nov. 2015, doi: [10.1016/j.eswa.2015.05.013](https://doi.org/10.1016/j.eswa.2015.05.013).
- [14] A. Jadhav, J. Kale, C. Rane, A. Datta, A. Deshpande, and D. D. Ambawade, “Forecasting FAANG Stocks using Hidden Markov Model,” in *2021 6th International Conference for Convergence in Technology (I2CT)*, Apr. 2021, pp. 1–4. doi: [10.1109/I2CT51068.2021.9418216](https://doi.org/10.1109/I2CT51068.2021.9418216).
- [15] A. Verma, K. Maheshwari, S. Gupta, and A. Rana, *Stock Price Prediction using Hidden Markov Models and understanding the nature of underlying Hidden States*. 2021.
- [16] “Stock market prediction using Hidden Markov Model | IEEE Conference Publication | IEEE Xplore.” <https://ieeexplore.ieee.org/document/7065011> (accessed Mar. 29, 2022).
- [17] Md. R. Hassan, “A combination of hidden Markov model and fuzzy model for stock market forecasting,” *Neurocomputing*, vol. 72, no. 16, pp. 3439–3446, Oct. 2009, doi: [10.1016/j.neucom.2008.09.029](https://doi.org/10.1016/j.neucom.2008.09.029).
- [18] E. K. Ampomah, G. Nyame, Z. Qin, P. C. Addo, E. O. Gyamfi, and M. Gyan, “Stock Market Prediction with Gaussian Naïve Bayes Machine Learning Algorithm,” *Informatica*, vol. 45, no. 2, Art. no. 2, Jun. 2021, doi: [10.31449/inf.v45i2.3407](https://doi.org/10.31449/inf.v45i2.3407).
- [19] Mehar Vijha, Deeksha Chandolab, Vinay Anand Tikkiwalb, Arun Kumar, Stock Closing Price Prediction using Machine Learning Techniques, International Conference on Computational Intelligence and Data Science (ICCIDS 2019)
- [20] A. Kurani, P. Doshi, A. Vakharia, and M. Shah, “A Comprehensive Comparative Study of Artificial Neural Network (ANN) and Support Vector Machines (SVM) on Stock Forecasting,” *Ann. Data. Sci.*, Jun. 2021, doi: [10.1007/s40745-021-00344-x](https://doi.org/10.1007/s40745-021-00344-x).
- [21] “Machine Learning in Prediction of Stock Market Indicators Based on Historical Data and Data from Twitter Sentiment Analysis | IEEE Conference Publication | IEEE Xplore.” <https://ieeexplore.ieee.org/document/6753954> (accessed Mar. 30, 2022).
- [22] Saahil Madge, “Predicting Stock Price Direction using Support Vector Machines,” https://www.cs.princeton.edu/sites/default/files/uploads/saahil_madge.pdf
- [23] S. R. Nanda, B. Mahanty, and M. K. Tiwari, “Clustering Indian stock market data for portfolio management,” *Expert Systems with Applications*, vol. 37, no. 12, pp. 8793–8798, Dec. 2010, doi: [10.1016/j.eswa.2010.06.026](https://doi.org/10.1016/j.eswa.2010.06.026).
- [24] “A hybrid fuzzy time series model based on granular computing for stock price forecasting - ScienceDirect.” <https://www.sciencedirect.com/science/article/abs/pii/S0020025514009505> (accessed Mar. 30, 2022).
- [25] M. Nabipour, P. Nayyeri, H. Jabani, A. Mosavi, E. Salwana, and S. S., “Deep Learning for Stock Market Prediction,” *Entropy (Basel)*, vol. 22, no. 8, p. 840, Jul. 2020, doi: [10.3390/e22080840](https://doi.org/10.3390/e22080840).

- [26] I. Parmar *et al.*, “Stock Market Prediction Using Machine Learning,” in *2018 First International Conference on Secure Cyber Computing and Communication (ICSCCC)*, Dec. 2018, pp. 574–576. doi: [10.1109/ICSCCC.2018.8703332](https://doi.org/10.1109/ICSCCC.2018.8703332).
- [27] J. Tang and X. Chen, “Stock Market Prediction Based on Historic Prices and News Titles,” in *Proceedings of the 2018 International Conference on Machine Learning Technologies*, New York, NY, USA, May 2018, pp. 29–34. doi: [10.1145/3231884.3231887](https://doi.org/10.1145/3231884.3231887).
- [28] E. Hoseinzade and S. Haratizadeh, “CNNpred: CNN-based stock market prediction using a diverse set of variables,” *Expert Systems with Applications*, vol. 129, pp. 273–285, Sep. 2019, doi: [10.1016/j.eswa.2019.03.029](https://doi.org/10.1016/j.eswa.2019.03.029).
- [29] P.Naveen , B Diwan, “STOCK MARKET PREDICTIONS USING NEURAL NETWORK MODEL,” *Journal of Shanghai Jiaotong University*, Volume 16, Issue7, July. 2020
- [30] X. Pang, Y. Zhou, P. Wang, W. Lin, and V. Chang, “Stock market prediction based on deep long short term memory neural network: 3rd International Conference on Complexity, Future Information Systems and Risk,” *COMPLEXIS 2018 - Proceedings of the 3rd International Conference on Complexity, Future Information Systems and Risk*, pp. 102–108, Mar. 2018.
- [31] Abin Shakya, Anuj Pokhrel, Ashuta Bhattarai, Pinky Sitikhu, Subarna Shakya, “Real-Time Stock Prediction using Neural Network,” *International Research Journal of Engineering and Technology (IRJET) – IEEE*, 2018
- [32] X.K. Xie, H. Wang, Recurrent neural network for forecasting stock market trend, in: *Proceedings of International Conference on Computer Science, Technology and Application*, 2017, pp. 397–402.
- [33] A. Ghosh, S. Bose, G. Maji, N. Debnath, and S. Sen, “Stock Price Prediction Using LSTM on Indian Share Market,” Sep. 2019. doi: [10.29007/qgcz](https://doi.org/10.29007/qgcz).
- [34] N. Unnithan, E. A. Gopalakrishnan, V. Menon, and S. Kp, “A Data-Driven Model Approach for DayWise Stock Prediction,” 2019, pp. 149–158. doi: [10.1007/978-981-13-5802-9_14](https://doi.org/10.1007/978-981-13-5802-9_14).
- [35] W. Lu, J. Li, Y. Li, A. Sun, and J. Wang, “A CNN-LSTM-Based Model to Forecast Stock Prices,” *Complexity*, vol. 2020, p. e6622927, Nov. 2020, doi: [10.1155/2020/6622927](https://doi.org/10.1155/2020/6622927).
- [36] J. Shen and M. O. Shafiq, “Short-term stock market price trend prediction using a comprehensive deep learning system,” *Journal of Big Data*, vol. 7, no. 1, p. 66, Aug. 2020, doi: [10.1186/s40537-020-00333-6](https://doi.org/10.1186/s40537-020-00333-6).
- [37] J. Zhao, D. Zeng, S. Liang, H. Kang, and Q. Liu, “Prediction model for stock price trend based on recurrent neural network,” *J Ambient Intell Human Comput*, vol. 12, no. 1, pp. 745–753, Jan. 2021, doi: [10.1007/s12652-020-02057-0](https://doi.org/10.1007/s12652-020-02057-0).
- [38] S. Selvin, V. Ravi, E. A. Gopalakrishnan, V. Menon, and S. Kp, “Stock price prediction using LSTM, RNN and CNN-sliding window model,” Sep. 2017, pp. 1643–1647. doi: [10.1109/ICACCI.2017.8126078](https://doi.org/10.1109/ICACCI.2017.8126078).

- [39] D. P. Kuttichira, E. A. Gopalakrishnan, V. K. Menon, and K. P. Soman, “Stock price prediction using dynamic mode decomposition,” in *2017 International Conference on Advances in Computing, Communications and Informatics (ICACCI)*, Sep. 2017, pp. 55–60. doi: [10.1109/ICACCI.2017.8125816](https://doi.org/10.1109/ICACCI.2017.8125816).
- [40] K. Bheemaiah, M. Esposito, and T. Tse, “What is machine learning?,” *The Conversation*. <http://theconversation.com/what-is-machine-learning-76759> (accessed Mar. 30, 2022).
- [41] “Understanding LSTM Networks -- colah’s blog.” <https://colah.github.io/posts/2015-08-Understanding-LSTMs/> (accessed Mar. 30, 2022).
- [42] “A Comprehensive Guide to Convolutional Neural Networks — the ELI5 way | by Sumit Saha | Towards Data Science.” <https://towardsdatascience.com/a-comprehensive-guide-to-convolutional-neural-networks-the-eli5-way-3bd2b1164a53> (accessed Mar. 30, 2022).
- [43] “Convolutional Neural Networks (CNN) with Deep Learning.” <https://www.happiestminds.com/insights/convolutional-neural-networks-cnns/> (accessed Mar. 30, 2022).
- [44] J. Brownlee, “CNN Long Short-Term Memory Networks,” *Machine Learning Mastery*, Aug. 20, 2017. <https://machinelearningmastery.com/cnn-long-short-term-memory-networks/> (accessed Mar. 30, 2022).
- [45] “Root Mean Square Error (RMSE) - C3 AI.” <https://c3.ai/glossary/data-science/root-mean-square-error-rmse/> (accessed Mar. 30, 2022).
- [46] Stephanie, “Mean Absolute Percentage Error (MAPE),” *Statistics How To*, Apr. 25, 2021. <https://www.statisticshowto.com/mean-absolute-percentage-error-mape/> (accessed Mar. 30, 2022).
- [47] K. Yadav, M. Yadav, and S. Saini, “Stock Market Predictions Using FastRNN, CNN, and Bi-LSTM-Based Hybrid Model,” in *Machine Vision and Augmented Intelligence—Theory and Applications*, Singapore, 2021, pp. 1–10. doi: [10.1007/978-981-16-5078-9_1](https://doi.org/10.1007/978-981-16-5078-9_1).
- [48] Q. Liu, Z. Tao, Y. Tse, and C. Wang, “Stock market prediction with deep learning: The case of China,” *Finance Research Letters*, vol. 46, p. 102209, May 2022, doi: [10.1016/j.frl.2021.102209](https://doi.org/10.1016/j.frl.2021.102209).
- [49] D. S. A. Elminaam, A. E. Tanany, M. A. Salam, and M. A. E. Fattah, “CPSMP_ML: Closing price Prediction of Stock Market using Machine Learning Models,” in *2022 2nd International Mobile, Intelligent, and Ubiquitous Computing Conference (MIUCC)*, May 2022, pp. 251–255. doi: [10.1109/MIUCC55081.2022.9781756](https://doi.org/10.1109/MIUCC55081.2022.9781756).
- [50] I. K. Nti, A. F. Adekoya, and B. A. Weyori, “A novel multi-source information-fusion predictive framework based on deep neural networks for accuracy enhancement in stock market prediction,” *Journal of Big Data*, vol. 8, no. 1, p. 17, Jan. 2021, doi: [10.1186/s40537-020-00400-y](https://doi.org/10.1186/s40537-020-00400-y).

- [51] P. Mehta, S. Pandya, and K. Kotecha, "Harvesting social media sentiment analysis to enhance stock market prediction using deep learning," *PeerJ Comput. Sci.*, vol. 7, p. e476, Apr. 2021, doi: [10.7717/peerj-cs.476](https://doi.org/10.7717/peerj-cs.476).
- [52] H. Rezaei, H. Faaljoui, and G. Mansourfar, "Stock price prediction using deep learning and frequency decomposition," *Expert Systems with Applications*, vol. 169, p. 114332, May 2021, doi: [10.1016/j.eswa.2020.114332](https://doi.org/10.1016/j.eswa.2020.114332).
- [53] M. Ghahramani and H. E. Najafabadi, "Compatible deep neural network framework with financial time series data, including data preprocessor, neural network model and trading strategy." arXiv, May 11, 2022. doi: [10.48550/arXiv.2205.08382](https://doi.org/10.48550/arXiv.2205.08382).
- [54] K. Gajamannage and Y. Park, "Real-time Forecasting of Time Series in Financial Markets Using Sequentially Trained Many-to-one LSTMs." arXiv, May 10, 2022. doi: [10.48550/arXiv.2205.04678](https://doi.org/10.48550/arXiv.2205.04678).
- [55] Z. Shi, Y. Hu, G. Mo, and J. Wu, "Attention-based CNN-LSTM and XGBoost hybrid model for stock prediction." arXiv, Apr. 06, 2022. doi: [10.48550/arXiv.2204.02623](https://doi.org/10.48550/arXiv.2204.02623).