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Demand Forecasting for Textile Products Using Machine Learning Methods

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Abstract

Due to its close relationship with various operational decisions, market demand forecasting has been considered one of the essential activities in all organizations. Unfortunately, the textile industry has been the most difficulty generating forecasts, mainly due to the volatility caused in the market by short product life cycles, special events, and competitions. From the beginning, forecasting has been using traditional statistical methods. However, the increasing use of artificial intelligence has opened a new catalog of prediction methods currently being studied for their high precision. This study explores machine learning (ML) as a tool to generate forecasts for the textile industry, applying regression-focused algorithms such as Linear Regression, Ridge, Lasso, K-nearest neighbor, Support Vector Regression (SVR), and Random Forest (RF). To this end, time series were used as inputs for the models, supported by external variables such as Google Trends and special events. The results show that ML as a prediction method has higher precision than purely statistical basic prediction models. Additionally, SVR and Ridge models obtain a lower error in metrics such as MSE (0.09787 and 0.09682), RMSE (0.31285 and 0.31117), and RSE (0.32977 and 0.32800), respectively. Meanwhile, Google Trends reduces the MSE error by 2% and 15%, RMSE 1% and 7% and, RSE 1% and 7% for SVR and Ridge models, respectively. © 2022, Springer Nature Switzerland AG.


Author keywords

Demand forecast; Google trends; Machine learning; Textile industry

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- 1 Nenni, M.E., Giustiniano, L., Pirolo, L.
Demand forecasting in the fashion industry: A review
([Open Access](#))

(2013) *International Journal of Engineering Business Management*, 5 (SPL.ISSUE). Cited 72 times.
http://cdn.intechopen.com/pdfs/45565/InTech-Demand_forecasting_in_the_fashion_industry_a_review.pdf
doi: 10.5772/56840

[View at Publisher](#)

- 2 Fumi, A., Pepe, A., Scarabotti, L., Schiraldi, M.M.
Fourier analysis for demand forecasting in a fashion company
([Open Access](#))

(2013) *International Journal of Engineering Business Management*, 5 (SPL.ISSUE). Cited 44 times.
http://cdn.intechopen.com/pdfs/45558/InTech-Fourier_analysis_for_demand_forecasting_in_a_fashion_compa.pdf
doi: 10.5772/56839

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Would you like to help us improve the References section on the document details page in Scopus?

- 3 Liu, N., Ren, S., Choi, T.-M., Hui, C.-L., Ng, S.-F.
Sales forecasting for fashion retailing service industry: A review (Open Access)

(2013) *Mathematical Problems in Engineering*, 2013, art. no. 738675. Cited 65 times.
doi: 10.1155/2013/738675

View at Publisher
-
- 4 Seçkin, M., Seçkin, A.Ç., Coşkun, A.
Production fault simulation and forecasting from time series data with machine learning in glove textile industry (Open Access)

(2019) *Journal of Engineered Fibers and Fabrics*, 14. Cited 8 times.
<https://journals.sagepub.com/toc/JEF/current>
doi: 10.1177/1558925019883462

View at Publisher
-
- 5 Desore, A., Narula, S.A.
An overview on corporate response towards sustainability issues in textile industry

(2018) *Environment, Development and Sustainability*, 20 (4), pp. 1439-1459. Cited 82 times.
www.wkap.nl/journalhome.htm/1387-585X
doi: 10.1007/s10668-017-9949-1

View at Publisher
-
- 6 Sabir, E.C., Batuk, E.
Demand forecasting withof using time series models in textile dyeing-finishing mills

(2013) *Tekstil ve Konfeksiyon*, 23 (2), pp. 143-151. Cited 3 times.
<http://www.tekstilvekonfeksiyon.com/pdf/20130429121653.pdf>
-
- 7 Teucke, M., Ait Alla, A., El-Berishy, N., Beheshti-Kashi, S., Lütjen, M.
(2014) *Forecasting of Seasonal Apparel Products*
Presented at the
https://doi.org/10.1007/978-3-319-23512-7_63
-
- 8 Abolghasemi, M., Hurley, J., Eshragh, A., Fahimnia, B.
Demand forecasting in the presence of systematic events: Cases in capturing sales promotions (Open Access)

(2020) *International Journal of Production Economics*, 230, art. no. 107892. Cited 12 times.
<https://www.journals.elsevier.com/international-journal-of-production-economics>
doi: 10.1016/j.ijpe.2020.107892

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Would you like to help us improve the References section on the document details page in Scopus?

- 9 Loureiro, A.L.D., Miguéis, V.L., da Silva, L.F.M.
Exploring the use of deep neural networks for sales forecasting in fashion retail
(2018) *Decision Support Systems*, 114, pp. 81-93. Cited 89 times.
doi: 10.1016/j.dss.2018.08.010
View at Publisher
-
- 10 Tanaka, R., Ishigaki, A., Suzuki, T., Hamada, M., Kawai, W.
Determination of shipping timing in logistics warehouse considering shortage and disposal in textile industry
(Open Access)
(2019) *Procedia Manufacturing*, 39, pp. 1567-1576.
<http://www.journals.elsevier.com/procedia-manufacturing>
doi: 10.1016/j.promfg.2020.01.285
View at Publisher
-
- 11 Kück, M., Freitag, M.
Forecasting of customer demands for production planning by local k-nearest neighbor models
(2021) *International Journal of Production Economics*, 231, art. no. 107837. Cited 29 times.
<https://www.journals.elsevier.com/international-journal-of-production-economics>
doi: 10.1016/j.ijpe.2020.107837
View at Publisher
-
- 12 Pena, M., Vazquez-Patino, A., Zhina, D., Montenegro, M., Aviles, A.
Improved Rainfall Prediction through Nonlinear Autoregressive Network with Exogenous Variables: A Case Study in Andes High Mountain Region (Open Access)
(2020) *Advances in Meteorology*, 2020, art. no. 1828319. Cited 8 times.
<http://www.hindawi.com/journals/amet/>
doi: 10.1155/2020/1828319
View at Publisher
-
- 13 Şahin, U., Ballı, S., Chen, Y.
Forecasting seasonal electricity generation in European countries under Covid-19-induced lockdown using fractional grey prediction models and machine learning methods
(2021) *Applied Energy*, 302, art. no. 117540. Cited 24 times.
<https://www.journals.elsevier.com/applied-energy>
doi: 10.1016/j.apenergy.2021.117540
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-
- 14 Zhang, H., Nguyen, H., Vu, D.-A., Bui, X.-N., Pradhan, B.
Forecasting monthly copper price: A comparative study of various machine learning-based methods
(2021) *Resources Policy*, 73, art. no. 102189. Cited 11 times.
www.elsevier.com/inca/publications/store/3/0/4/6/7/
doi: 10.1016/j.resourpol.2021.102189
View at Publisher

Would you like to help us improve the References section on the document details page in Scopus?

- 15 Ahmad, M.W., Reynolds, J., Rezgui, Y.
Predictive modelling for solar thermal energy systems: A comparison of support vector regression, random forest, extra trees and regression trees ([Open Access](#))
- (2018) *Journal of Cleaner Production*, 203, pp. 810-821. Cited 158 times.
<https://www.journals.elsevier.com/journal-of-cleaner-production>
doi: 10.1016/j.jclepro.2018.08.207
- [View at Publisher](#)
-
- 16 Mei, J., He, D., Harley, R., Habetler, T., Qu, G.
A random forest method for real-time price forecasting in New York electricity market
- (2014) *IEEE Power and Energy Society General Meeting, 2014-October* (October), art. no. 6939932. Cited 34 times.
<http://ieeexplore.ieee.org/xpl/conferences.jsp>
ISBN: 978-147996415-4
doi: 10.1109/PESGM.2014.6939932
- [View at Publisher](#)
-
- 17 Stekhoven, D.J., Bühlmann, P.
Missforest-Non-parametric missing value imputation for mixed-type data ([Open Access](#))
- (2012) *Bioinformatics*, 28 (1), art. no. btr597, pp. 112-118. Cited 1837 times.
doi: 10.1093/bioinformatics/btr597
- [View at Publisher](#)
-
- 18 Lebel, J.M., Kratz, F., Bloch, G.
Missing values rebuilding by prediction and ARIMA modelling in time series (1989) *IFAC Proc*, 22, pp. 357-361.
[https://doi.org/10.1016/S1474-6670\(17\)54400-6](https://doi.org/10.1016/S1474-6670(17)54400-6)
-
- 19 Alghushairy, O., Alsini, R., Soule, T., Ma, X.
A review of local outlier factor algorithms for outlier detection in big data streams ([Open Access](#))
- (2021) *Big Data and Cognitive Computing*, 5 (1), art. no. 1, pp. 1-24. Cited 34 times.
<https://www.mdpi.com/2504-2289/5/1/1>
doi: 10.3390/bdcc5010001
- [View at Publisher](#)
-
- 20 Balaji Prabhu, B.V., Dakshayini, M.
Performance Analysis of the Regression and Time Series Predictive Models using Parallel Implementation for Agricultural Data ([Open Access](#))
- (2018) *Procedia Computer Science*, 132, pp. 198-207. Cited 15 times.
<http://www.sciencedirect.com/science/journal/18770509>
doi: 10.1016/j.procs.2018.05.187
- [View at Publisher](#)

Would you like to help us improve the References section on the document details page in Scopus?

21 Joshi, S.
(2019) *Time Series Analysis and Forecasting of the US Housing Starts Using Econometric and Machine Learning Model*. *Arxiv.Org*. Cited 3 times.

22 Shafiee, S., Lied, L.M., Burud, I., Dieseth, J.A., Alsheikh, M., Lillemo, M.
Sequential forward selection and support vector regression in comparison to LASSO regression for spring wheat yield prediction based on UAV imagery ([Open Access](#))

(2021) *Computers and Electronics in Agriculture*, 183, art. no. 106036. Cited 29 times.

www.elsevier.com/inca/publications/store/5/0/3/3/0/4

doi: 10.1016/j.compag.2021.106036

[View at Publisher](#)

23 Xin, J., Chen, S.
Bus Dwell Time Prediction Based on KNN ([Open Access](#))

(2016) *Procedia Engineering*, 137, pp. 283-288. Cited 18 times.

<http://www.sciencedirect.com/science/journal/18777058>

doi: 10.1016/j.proeng.2016.01.260

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24 Smola, A.J., Schölkopf, B.
A tutorial on support vector regression ([Open Access](#))

(2004) *Statistics and Computing*, 14 (3), pp. 199-222. Cited 7193 times.

doi: 10.1023/B:STCO.0000035301.49549.88

[View at Publisher](#)

25 Tiwari, R., Srivastava, S., Gera, R.
Investigation of Artificial Intelligence Techniques in Finance and Marketing ([Open Access](#))

(2020) *Procedia Computer Science*, 173, pp. 149-157. Cited 10 times.

<http://www.sciencedirect.com/science/journal/18770509>

doi: 10.1016/j.procs.2020.06.019

[View at Publisher](#)

26 Paredes, A.P., Ángeles, J.A.C., Villalobos, A.M.G., Fonseca, V.J.
Importancia de los pronósticos en la toma de decisiones en las MIPYMES (2018) *Organ. Y Negocios*, 5, pp. 97-114.
Rev. GEON (Gestión)
<https://doi.org/10.22579/23463910.17>

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