

Predicting Covid-19 Case Trend using Time Series Analysis Methods

**Prof. Dinesh B. Satre, Mrunal R. Yemale, Namrata A. Kassa,
Harshada N. Mankeshwarker, Rutuja N. Lokhande**

Department of Computer Engineering
Marathwada Mitramandal's Institute of Technology, Pune, India

Abstract: *The COVID-19 pandemic has created havoc all over the world. Millions of lives have been gone and thousands are vulnerable. It has also affected the world economy due to lockdown. So, there is a need to develop a time-series forecasting model for predicting future cases so that necessary precautions can be taken. The aim is to help in coping up with the situation without affecting lifestyle any further. Therefore, an accurate prediction of the future spread of COVID-19 becomes crucial in such a situation. In this comparative study, two different time-series analysis models, namely the ARIMA model, the Prophet model, which are machine learning model are investigated to determine which has the best performance when predicting the future case trends of COVID-19 in India. The project highlight is to predict the spread of COVID-19 so that countries can be better prepared and aware when controlling the spread.*

Keywords: COVID-19, Time-Series Forecasting, ARIMA, Prophet, machine learning

REFERENCES

- [1] 10101998 Coronavirus Update (Live). Cases and 501644 deaths from COVID19 virus pandemic - worldometer. Available at: <https://www.worldometers.info/coronavirus/>. [Accessed 28 June 2020].
- [2] Lok Kumar Sahai, Namita Rath, Vishal Sood, Manvendra Pratap Singh. ARIMA modelling & forecasting of COVID-19 in top five affected countries.
- [3] Sulasikin, Y. Nugraha, J. Kanggrawan and A. L. Suherman, "Forecasting for a data-driven policy using time series methods in handling COVID-19 pandemic in Jakarta," 2020 IEEE International Smart Cities Conference (ISC2), Piscataway, NJ, USA, 2020, pp. 1-6, doi: 10.1109/ISC251055.2020.9239066.
- [4] Andres Hernandez-Matamoros, Hamido Fujita, Toshitaka Hayashi. Forecasting of COVID19 per regions using ARIMA models and polynomial functions
- [5] S. Siami-Namini, N. Tavakoli and A. Siami Namin, "A Comparison of ARIMA and LSTM in Forecasting Time Series," 2018 17th IEEE International Conference on Machine Learning and Applications (ICMLA), Orlando, FL, 2018, pp. 1394-1401, doi: 10.1109/ICMLA.2018.00227.
- [6] V. Kotu and B. Deshpande, "Chapter 12 - Time Series Forecasting," in Data Science (Second Edition), V. Kotu and B. Deshpande, Eds. Morgan Kaufmann, Jan. 2019, pp. 395-445. ISBN 978-0-12-814761-0. [Online]. Available: https://www.sciencedirect.com/science/article/pii/B978_0128147610000125 [Page 8.]
- [7] "Prophet." [Online]. Available: <http://facebook.github.io/prophet/> [Pages 9 and 30.]
- [8] I. Yenidoğan, A. Çayır, O. Kozan, T. Dağ, and Arslan, "Bitcoin Forecasting Using ARIMA and PROPHET," in 2018 3rd International References | 57 Conference on Computer Science and Engineering (UBMK), Sep. 2018. doi: 10.1109/UBMK.2018.8566476 pp. 621-624. [Page 10.]
- [9] G. A. Papacharalampous and H. Tyrallis, "Evaluation of random forests and Prophet for daily streamflow forecasting," in Advances in Geosciences, vol. 45. Copernicus GmbH, Aug. 2018. doi: 10.5194/adgeo-45-201-2018 pp. 201-208, iSSN: 1680-7340. [Online]. Available: <https://adgeo.copernicus.org/articles/45/201/2018/> [Page 10.]
- [10] C. B. Aditya Satrio, W. Darmawan, B. U. Nadia, and N. Hanafiah, "Time series analysis and forecasting of coronavirus disease in Indonesia using ARIMA model and PROPHET," Procedia Computer Science, vol. 179, pp. 524-532, Jan. 2021. doi: 10.1016/j.procs.2021.01.036. [Online]. Available: <https://www.sciencedirect.com/science/article/pii/S1877050921000417> [Page 14.]

