

A COMPLETE REVIEW ON STATE-OF-THE-ART MACHINE LEARNING TECHNIQUES TO DIAGNOSE THE CORONA VARIANT INFECTION

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ABSTRACT

COVID-19 is no longer a pandemic, but rather an endemic disease that has claimed the lives of billions of people globally. COVID-19 has no specific treatment, thus living with the condition and its symptoms is unavoidable. To deal with COVID-19-related symptoms, researchers from all areas of study were brought in to cope up with this disease effectively. Machine learning (ML) methods are broadly utilized to detect a variety of infections in various diseases. To detect and diagnose corona viruses variant different machine learning methods are being used widely. In this paper, we will review various state-of-the-art machine learning algorithms and how it can be used to combat the epidemic.

KEYWORDS: SARS-COVID19 (Corona Virus Disease), SARS-CoV2 (Severe Acute Respiratory Syndrome Coronavirus 2), Corona Variant, Lockdown 24-March-2020, Delta variant, Gamma variant, Omicron, Neo Cov variant, Machine learning, Deep learning.

REFERENCES

1. Sayantani Basu, Roy H. Campbell, Going by the Numbers : Learning and Modeling COVID-19 Disease Dynamics, Chaos, Solitons and Fractals (2020), doi: <https://doi.org/10.1016/j.chaos.2020.110140>
2. Yakovyna and N. Shakhovska, Modelling and predicting the spread of COVID-19 cases depending on restriction policy based on mined recommendation rules Vitality,Mathematical Biosciences and Engineering Volume 18, Issue 3, pp. 2789–2812, 2021.
3. KrishnarajChadaga, SrikanthPrabhu, Bhat K Vivekananda, S. Niranjana&ShashikiranUmakanth, Battling COVID-19 using machine learning: A review, Cogent Engineering, 8:1, 2021. DOI: 10.1080/23311916.2021.1958666
4. L. J. Muhammad et al., Supervised Machine Learning Models for Prediction of COVID-19 Infection using Epidemiology Dataset, SN Computer Science pp. 2-11, Springer Nature Singapore 2021. <https://doi.org/10.1007/s42979-020-00394-7>
5. COVID-19 Scenarios. <https://neherlab.org/covid19/>, 2020.
6. COVID-19 Hospital Impact Model for Epidemics. <https://penn-chime.phl.io>, 2020.
7. Zixin Hu, QiyangGe, Li Jin, and MomiaoXiong. Artificial intelligence forecasting of COVID-19 in China. arXiv preprint arXiv:2002.07112, 2020.
8. Z. Wang et al., Evaluating the traditional Chinese medicine (TCM) officially recommended in China for COVID-19 using ontology-based side-effect prediction framework (OSPF) and deep learning, Preprints 2020, 2020020230, 2020.
9. Y. Wang et al., Abnormal respiratory patterns classifier may contribute to large-scale screening of people infected with COVID-19 in an accurate and unobtrusive manner. arXiv preprint arXiv:2002.05534, 2020
10. S. Wang, et al. A deep learning algorithm using CT images to screen for Corona Virus Disease (COVID-19), medRxiv, 2020.
11. P.K. Sethy and S. K.Behera. Detection of coronavirus disease (COVID-19) based on deep features, Preprints 2020, 2020030300, 2020.
12. Souza FSH et al., Predicting the disease outcome in COVID-19 positive patients through Machine Learning: a retrospective cohort study with Brazilian data. medRxiv, 2020.
13. Assaf D. et al., Utilization of machine-learning models to accurately predict the risk for critical COVID-19, Internal and emergency medicine, Vol. 15 Issue 8, pp.1435–1443. PMID:32812204, 2020;
14. Pourhomayoun M, Shakibi M., Predicting mortality risk in patients with COVID-19 using machine learning to help medical decision-making, Smart Health. 2021; p. 100178. PMID:33521226
15. Yan L, et al. Prediction of survival for severe Covid-19 patients with three clinical features: development of a machine learning-based prognostic model with clinical data in Wuhan. medRxiv. 2020.

16. M. Kamal et al., IOT MEETS COVID-19: STATUS, CHALLENGES, AND OPPORTUNITIES, arXiv:2007.12268v1 [cs.DC] 28 Jun 2020.
 17. V. Chamola et al., Comprehensive Review of the COVID-19 Pandemic, IEEE ACCESS, Special Section on Deep Learning Algorithms for Internet of Medical Things, Vol. 8, pp. 90225- 90265, 2020.
 18. M. Otoom et al., An IoT-based framework for early identification and monitoring of COVID-19 cases, Biomedical Signal Processing and Control, Elsevier, Vol. 62, 10214, 2020. doi: 10.1016/j.bspc.2020.102149
 19. M. N. Mohammed et al., Novel Covid-19 Detection and Diagnosis System Using IoT Based Smart Helmet, International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 7, pp. 2296-2303, 2020.
 20. Nasajpour et al., Internet of Things for Current COVID-19 and Future Pandemics: an Exploratory Study. J Healthc Inform Res 4, pp. 325–364, 2020. <https://doi.org/10.1007/s41666-020-00080-6>
 21. Tayarani N, M. H. (2021). Applications of artificial intelligence in battling against covid-19: A literature review. Chaos, Solitons, and Fractals, 142, 110338. <https://doi.org/10.1016/j.chaos.2020.110338>
 22. Tschoellitsch, T., Dünser, M., Böck, C., Schwarzbauer, K., & Meier, J. (2020). Machine learning prediction of SARS-CoV-2 polymerase chain reaction results with routine blood tests. Laboratory Medicine. <https://doi.org/10.1093/labmed/lmaa111>
 23. TsikalaVafea, M., et al. (2020). Emerging technologies for use in the study, diagnosis, and treatment of patients with COVID-19. Cellular and Molecular Bioengineering, 13(4), 249–257. <https://doi.org/10.1007/s12195-020-00629-w>
 24. Sachdeva, S., Aleem Ali, “Machine learning with digital forensics for attack classification in cloud network environment”, International Journal of System Assurance Engineering Management, Springer, 2021, <https://doi.org/10.1007/s13198-021-01323-4>
 25. Uddin, M. I., Shah, S. A. A., & Al-Khasawneh, M. A. (2020). A novel deep convolutional neural network model to monitor people following guidelines to avoid COVID-19. Journal of Sensors, 2020, 1–15. <https://doi.org/10.1155/2020/8856801> [Crossref], [Web of Science], [Google Scholar]
 26. Unberath, M., Ghobadi, K., Levin, S., Hinson, J., & Hager, G. D. (2020). Artificial intelligence-based clinical decision support for COVID-19 – Where Art Thou? Advanced Intelligent Systems, 2(9), 2000104. <https://doi.org/10.1002/aisy.202000104> [Crossref], [Google Scholar]
 27. Vadyala, S. R., Betgeri, S. N., Sherer, E. A., & Amritphale, A. (2020). Prediction of the number of covid-19 confirmed cases based on k-means-lstm. In arXivPrepr. arXiv2006.14752. [Google Scholar]
 28. Vaishya, R., Javaid, M., Khan, I. H., & Haleem, A. (2020). Artificial Intelligence (AI) applications for COVID-19 pandemic. Diabetes & Metabolic Syndrome: Clinical Research & Reviews, 14(4), 337–339. <https://doi.org/10.1016/j.dsx.2020.04.012>
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29. Vamathevan, J., et al. (2019). Applications of machine learning in drug discovery and development. *Nature Reviews Drug Discovery*, 18(6), 463–477.
30. Van der Schaar, M., et al. (2021). How artificial intelligence and machine learning can help healthcare systems respond to COVID-19. *Machine Learning*, 110(1), 1–14. <https://doi.org/10.1007/s10994-020-05928-x> [Crossref], [Web of Science ®], [Google Scholar]
31. Yan, L., et al. (2020). A machine learning-based model for survival prediction in patients with severe COVID-19 infection. *medRxiv*, <https://doi.org/10.1101/2020.02.27.20028027>.
32. Yang, D., Yurtsever, E., Renganathan, V., Redmill, K. A., & Özgüner, Ü. A vision-based social distancing and critical density detection system for COVID-19, 2020, In arXiv.
33. Mario A. Quiroz-Juárez, A. Torres-Gómez,(2021) .Identification of high-risk COVID-19 patients using machine learning. <https://doi.org/10.1371/journal.pone.0257234>.
34. Mustafa Abdul Salam ,S. Taha ,Md Ramadan(2021), COVID-19 detection using federated machine learning, <https://doi.org/10.1371/journal.pone.0252573>
35. S. Sachdeva, AleemAli,” A Hybrid approach using digital Forensics for attack detection in a cloud network environment", *International Journal of Future Generation Communication and Networking*, Vol .14, No. 1,pp. 1536-1546,2021.
36. S. Sachdeva, Aleem Ali,” Machine learning with digital forensics for attack classification in cloud network environment”, *International Journal of System Assurance Engineering Management*, Springer, 2021. <https://doi.org/10.1007/s13198-021-01323-4>.
37. R. Kaur, Aleem Ali,” A Novel Blockchain Model for Securing IoT Based Data Transmission”, *International Journal of Grid and Distributed Computing* Vol. 14, No. 1, pp. 1045-1055, 2021.
38. Kaur R., AleemAli,”Performance evaluation of secure blockchain framework for IoT based data communication”, *International Journal of System Assurance Engineering Management*, Springer, 2021. <https://doi.org/10.1007/s13198-021-01324-3>