for neuron 6. Also, neuron six had outperformed these for these two models as compared to neurons. Further, the neuron 6 of the CO and CU model gives the lowest AIC values as 1.2054 and 1.1093, respectively, with the highest stationary and quality. Similarly, for the DE model, the neuron 12 had offers the lowest MSE metrics with 3.4151 as well as the lowest AIC value with 585.7667 as compared to other neurons by employing the artificial neural network with the NARX algorithm. Therefore, the proposed COCUDE model predicts the precise future infection cases, cured cases, and decease cases. Such that the results of the proposed COCUDE model might more helpful for respective authorities to plan future any necessities because of the COVID-19 pandemic. Future work will concentrate on evaluating the proposed COCUDE model for all other states of India. Moreover, evaluating the survivability factor after recovering from COVID-19 and other influencing factors of the COVID-19 will be investigated.

Compliance with Ethical Standards:

Conflicts of interest: Nil
Research involving human participants and/or animals: Nil
Informed consent: NA

References

[1] Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, Ren R, Leung KS, Lau EH, Wong JY, Xing X. Early transmission dynamics in Wuhan, China, of novel coronavirus–infected pneumonia. New England Journal of Medicine. 2020 Jan 29.
[2] World Health Organisation. Coronavirus disease 2019 (COVID-19): 2020 [Press release].
[3] European Centre for Disease Prevention and Control. Novel coronavirus disease 2019 (COVID19) pandemic: increased transmission in the EU/EEA and the UK –2020: [Press release]. ECDC, Stockholm.
[4] Tang Z, Li X, Li H. Prediction of new coronavirus infection based on a modified SEIR model. medRxiv; 2020 Jan 1.
[5] Ayubali AA, Satheesh SR. On predicting the novel COVID-19 human infections by using Infectious Disease modelling method in the Indian State of Tamil Nadu during 2020. medRxiv. 2020 Jan 1.
[6] Li L, Yang Z, Dang Z, Meng C, Huang J, Meng H, Wang D, Chen G, Zhang J, Peng H, Shao Y. Propagation analysis and prediction of the COVID-19. Infectious Disease Modelling. 2020 Jan 1;5:282-92.
[7] Corman VM, Landt O, Kaiser M, Molenkamp R, Meijer A, Chu DK, Bleicker T, Brünink S, Schneider J, Schmidt ML, Mulders DG. Detection of 2019 novel coronavirus (2019-nCoV) by real-time RT-PCR. Eurosurveillance. 2020 Jan 23;25(3):2000045.
[8] Ranjan R. Predictions for COVID-19 outbreak in India using Epidemiological models. medRxiv. 2020 Jan 1.
[9] Gupta R, Pal SK. Trend Analysis and Forecasting of COVID-19 outbreak in India. medRxiv. 2020 Jan 1.
[10] Read JM, Bridgen JR, Cummings DA, Ho A, Jewell CP. Novel coronavirus 2019-nCoV: early estimation of epidemiological parameters and epidemic predictions. MedRxiv. 2020 Jan 1.
[11] Shao Y, Wu J. IDM editorial statement on the 2019-nCoV. Infectious Disease Modelling. 2020;5:233.

[12] Hethcote HW. The mathematics of infectious diseases. SIAM review. 2000;42(4):599-653.
[13] Li MY, Wang L. Global stability in some SEIR epidemic models. In Mathematical approaches for emerging and reemerging infectious diseases: models, methods, and theory 2002; Springer, New York, NY. 295-311.
[14] Zhou X, Cui J. Analysis of stability and bifurcation for an SEIR epidemic model with saturated recovery rate. Communications in nonlinear science and numerical simulation. 2011 Nov 1;16(11):4438-50.
[15] Levin SA. New directions in the mathematics of infectious disease. In Mathematical approaches for emerging and reemerging infectious diseases: models, methods, and theory 2002; Springer, New York, NY. 1-5.
[16] https://api.covid19india.org/csv/
[17] https://nhmtn.maps.arcgis.com/apps/opsdashboard/index.html#/095ad0a1c0254b058fa36b32d1ab1977
[18] Theerthagiri, P. CoFEE: Context-aware futuristic energy estimation model for sensor nodes using the Markov model and autoregression. International Journal of Communication Systems, 201; e4248.
[19] Benvenuto D, Giovanetti M, Vassallo L, Angeletti S, Ciccozzi M. Application of the ARIMA model on the COVID-2019 epidemic dataset. Data in brief. 2020 Feb 26;105340.
[20] Anne R. ARIMA modelling of predicting COVID-19 infections. medRxiv. 2020 Jan 1.
[21] Theerthagiri, P. FUCEM: futuristic cooperation evaluation model using Markov process for evaluating node reliability and link stability in mobile ad hoc network. Wireless Netw (2020).
[22] Ghosh P, Ghosh R, Chakraborty B. COVID-19 in India: State-wise Analysis and Prediction. JMIR Public Health Surveill 2020;6(3):e20341.
[23] Rafiq D, Suhail SA, Bazaz MA. Evaluation and prediction of COVID-19 in India: A case study of worst hit states. Chaos, Solitons & Fractals. 2020 Oct 1;139:110014.
[24] Theerthagiri P, Thangavelu M. Futuristic speed prediction using auto-regression and neural networks for mobile ad hoc networks. International Journal of Communication Systems. 2019 Jun;32(9):e3951.
[25] Prasannavenkatesan, T. Forecasting Hyponatremia in hospitalized patients Using Multilayer Perceptron and Multivariate Linear Regression Techniques. arXiv preprint arXiv:2007.15554.