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Intelligent Computing with Bayesian Regularization Artificial Neural Networks for a Nonlinear System of COVID-19 Epidemic Model for Future Generation Disease Control

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Abstract : In this research work, we design intelligent computing through Bayesian Regularization artificial neural networks (BRANNs) introduced to solve the mathematical modeling of infectious diseases (Covid-19). The dynamical transmission is due to the interaction of people and its mathematical representation based on the system's nonlinear differential equations. The generation of the dataset of the Covid-19 model is exploited by the power of the explicit Runge Kutta method for different countries of the world like India, Pakistan, Italy, and many more. The generated dataset is approximately used for training, testing, and validation processes for every frequent update in Bayesian Regularization backpropagation for numerical behavior of the dynamics of the Covid-19 model. The performance and effectiveness of designed methodology BRANNs are checked through mean squared error, error histograms, numerical solutions, absolute error, and regression analysis.

Keywords : mathematical models, beysian regularization, bayesian-regularization backpropagation networks, regression analysis, numerical computing
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