

Machine Learning Approach for the Prediction of COVID-19 Spread in Nigeria Using SIR Model.

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- **Abstract:** The recent evolution of the novel COVID-19 pandemic posed unprecedented challenges for the global community and researchers alike without reference literature or prior prediction approaches applied to that context, leading to its great impact on the economies of different countries. This work aims to address these challenges by predicting the spread of COVID-19 in Nigeria. In order to carry out this research, raw data on COVID-19 pandemic in Nigeria was gotten from John Hopkins University repository through Github as submitted by the Nigeria Center for Disease Control (NCDC) through the World Health Organization (WHO). Python, along with its packages such as Numpy, SciPy, Pandas, Matplotlib, and Plotly, was used to process and visualize the data for this model. Google Colab; a Jupyter notebook environment that run on the cloud was employed too. The SIR (Susceptible, Infected, Recovered or Removed) population model, which is commonly employed for modelling epidemics, was used to predict the spread of the pandemic in Nigeria. The machine learning Python packages used in the analysis included Pandas for data analysis and manipulation, Numpy for executing mathematical and logical operations, and SciPy for operations such as regression, minimization, and Fourier series. The model developed in this study predicted a peak of the pandemic between June and August, 2020, and a flattening of the curve in January 2021; the predicted dates were accurate when compared to real-world data. The outcome of the study provides better insight (for instance; rate of spread in response to certain conditions and corresponding mortality or survival rate) on the future of the COVID-19 pandemic; yielding more information that will help in planning for the future through evidenced correctness and reliability. The work present the recovery coefficient rate (β), the transmission coefficient (γ) and, the basic reproduction ratio (R_0) values for the data under consideration that indicates a reliable model for predictions.

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