

Disease Informed Neural Network and Mathematical Modeling of COVID-19 with Human Intervention

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The NSF-IHBEM Project INSIGHT collaboration between teams from IAUPR and GMU introduce a Disease Informed Neural Network (DINN) trained using synthetic data obtained from mathematical modeling and its analysis. The compartmental model of COVID-19 integrates human interactions that alters a normal behavior responding to a perceived increase of the infections in the local environment.

In this poster we will present the DINN model and analyze its results and performance. A Sensitivity analysis is introduced calculating the sensitivity index of the Basic Reproduction Number (\mathcal{R}_0). We show the impact of parameter on the variables using forward sensitivity analysis introducing some modifications to the original model. Results will be discussed to gain valuable insight, and to showcase the importance of mathematics and these diverse tools in health emergencies such as COVID-19.