Abstract

In this thesis, we study the history of computer network virus (CNV) and significance of mathematical modeling in computer network virus control. We do formulation and scaling of CNV mathematical model. After modeling we check the existence, boundedness, uniqueness and positivity of the solution of the model. Then we do stability analysis of our CNV model.

Furthermore, we do sensitivity analysis of our CNV model and also visualize the graphical images to recognize the most sensitive parameter. After performing sensitivity analysis, we apply optimal control strategies to our CNV model for better understanding.

This study aims to model the dynamics of computer network viruses using epidemiological frameworks, particularly the SIS (Susceptible-Infected-Susceptible) and SEIR (Susceptible-Exposed-Infected-Recovered) models. The objective is to incorporate optimal control analysis to determine the most effective vaccination (anti-virus) strategies that can minimize the spread and impact of viruses within a network.