Department of Computer Science

St. Francis Xavier University

Presents

Effective Vaccination Strategy for Infectious Diseases by Analyzing the Age and Comorbidity Attributes of Individuals on Social Network

by

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The impact of infectious diseases on human society is immense, and the failure to control them can lead to a catastrophic outcome. Infectious diseases can be minimized and prevented by vaccination, one of the most comprehensive and effective methods available. There is therefore a need to know how to apply a limited number of vaccines to a population such that outbreaks of disease are minimized.

In this study, we are proposing a system that can be beneficial to minimize disease spread by developing effective vaccination strategies. It is designed to work with a graph representing a real social network, and for modeling the spread of the disease, we will use the Susceptible, Exposed, Infectious, Removed (SEIR) epidemic model. We will construct an epidemic model taking into account the age and comorbidities of the individuals in a community, and then run it using Genetic Programming (GP) to discover new vaccination strategies. Having derived vaccination strategies, we will then examine how age and comorbidities of individuals influence vaccination strategies. In this study, all the parameters will be determined by focusing on the COVID-19 disease, however, the method can also be applied to other epidemics.