عنوان مقاله:

Estimating algorithms for prediction and spread of a factor as a pandemic: a case study of global COVID-۱۹ prevalence

نویسندگان:

Hamidh Rezaei Nezhad - *Department of Computer, Kerman Branch, Islamic Azad University, Kerman, Iran*

Farshid Keynia - *Department of Energy Management and Optimization, Institute of Science and High Technology and Environmental Sciences, Graduate University of Advanced Technology, Kerman, Iran*

Amir Sabagh Mola Hoseini - *Department of Computer, Kerman Branch, Islamic Azad University, Kerman, Iran*

خلاصه مقاله:

Background: This paper presents open-source computer simulation programs developed for simulating, tracking, and estimating the COVID-۱۹ outbreak.Methods: The programs consisted of two separate parts: one set of programs built in Simulink with a block diagram display, and another one coded in MATLAB as scripts. The mathematical model used in this package was the SIR, SEIR, and SEIRD models represented by a set of differential-algebraic equations. It can be easily modified to develop new models for the problem. A generalized method was adopted to simulate worldwide outbreaks in an efficient, fast, and simple way.Results: To get a good tracking of the virus spread, a sum of sigmoid functions was proposed to capture any dynamic changes in the data. The parameters used for the input (infection and recovery rate functions) were computed using the parameter estimation tool in MATLAB. Several statistic methods were applied for the rate function including linear, mean, root-mean-square, and standard deviation. In addition, an adaptive neuro-fuzzy inference system (ANFIS) was employed and proposed to train the model and predict its output.Conclusion: This procedure is presented in such a way that it can be generalized and applied in other parts and applications of estimating the scenarios of an event, including the potential of several models, including SIR, which is sensitive to pollution, etc. This program can be used as an educational tool or for research studies and this article promises some lasting contributions to field of COVID-۱۹.

کلمات کلیدی:

Algorithms; COVID-۱۹; Epidemiology; Pandemics; Viruses

لینک ثابت مقاله در پایگاه سیویلیکا:

https://civilica.com/doc/1546717