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Monitoring Transmission Dynamics and Impact of Habit and Past Health Records on COVID-19

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ABSTRACT

COVID-19 stands for Corona Virus Disease 2019. World Health Organization (WHO) on March 11, 2020 declared COVID-19 as "pandemic". For fighting against COVID-19 pandemic, two issues are taken into consideration. The first issue is to monitor transmission dynamics, i.e., how the disease is spreading. The target of this research is to predict the spreading pattern beforehand. The second issue is to detect the occurrence of COVID-19 disease by analyzing former habits as well as history of other diseases. The objective of the first issue determines if it is feasible to use machine learning method to evaluate how much prediction results are close to original data related to Confirmed-Negative-Released-Death cases of COVID-19. For this purpose, a verification method is proposed that uses the concept of Deep-learning Neural Network. The data driven automated tool can confirm, estimate the current position of this pandemic, assesses the severity, and assists government and health workers to act for good decision-making policy. The second issue considers the outbreak of this disease happens based on numerous factors such as past health records and habits of patients. A deep learning framework is investigated to verify the relationship between past health records, habits of patients and COVID-19 occurrence. A stacked Gated Recurrent Unit (GRU) based model is proposed in this paper that identifies whether a patient can be infected by this disease or not. The proposed model reaches highest accuracy of 65.36%. Healthcare industry requires real time collection and processing of medical data. The main point of this industry considers the problem of data handling in real time for prediction and quick attention. Monitoring transmission dynamics and COVID-19 disease classification task are necessary to be performed for supporting current pandemic situation. The above-mentioned studies may assist the physicians or health workers by providing promising supplementary rechecking method.

Keywords: COVID-19, Past habits, Transmission dynamics, Past health records, Deep Learning

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