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DEEP LEARNING MODELS TO PREDICT COVID-19 CASES IN INDIA USING AIR POLLUTION AND METEOROLOGICAL DATA

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Abstract

A worldwide pandemic caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), known as coronavirus disease 2019 (COVID-19), has killed many people. More than 31.6 million cases have been recorded in India alone till 2021. The main aim of this study is to identify the relationship between COVID-19 and air pollution concerning geographical location. Considerably air pollution also increases the cases, and COVID-19 disease causes damage to the respiratory system. Applying the Long short-term memory (LSTM) and Bidirectional Long short-term memory (BiLSTM) deep Learning model, this work attempts at giving insight into the connection between the various factors impacting COVID-19 mortality rates, i.e., the dispersion between the confirmed number of cases and the air pollution levels in major urban centres, namely Delhi, Bengaluru, Chennai, Mumbai, and Kolkata in India. COVID-19 infections discovered that there is an association between high PM10 and PM2.5 pollution levels and having confirmed diseases are high. There is a concrete relationship between PM2.5 and COVID-19 mortality, which confirmed by the developed deep learning model that uses multiple regression analysis. The research model estimate, forecast and track COVID-19 case infections effects on air pollution, particularly in metropolitan cities. The BiLSTM model gives better score values between 0.903 and 0.951, whereas the LSTM model scores between 0.754 and 0.829. This research reveals a link between health and air pollutions parameters during this pandemic period. The results obtained from the research show a constructive co-relationship between the level of air pollution and diffusion of coronavirus.

Keywords: air pollution, BiLSTM, coronavirus, deep learning, mortality rates

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