

## **Exploration of Temporal-spatially varying Impacts on COVID-19 Cumulative Case in Texas using geographically weighted regression (GWR)**

Since COVID-19 is extremely menacing human's health, it is a significant to expose on its factor's impacts for curbing the virus. To address the complexity of COVID-19 expansion in spatial-temporal scale, this research is appropriately analyzed the spatial-temporal heterogeneity at county-level in Texas. First, factors impact of COVID-19 are captured on social, economic, and environmental multiple-facets and the Communality is extracted through Principal Component Analysis (PCA). Second, this research is used COVID-19 CC as the dependent variable and the common factors as the independent variable. According to the degree of the virus spreading, spatial-temporal disparity is categorized four quarters in the modeling GWR analysis. The findings are exhibited that GWR models provided higher fitness, more geodata-oriented information than OLS models. In Texas El Paso, Odessa, Midland, Randall areas, population, hospitalization, and age structure presented static, positive influences on COVID-19 cumulative cases, indicating they should be adopted stringent strategies in curbing COVID-19. Winter is the most sensitive season for the virus spreading, implying the last quarter should be pay more attention to prevent the virus and take precautions. This research is expected to provide references for preventing and controlling COVID-19 and related infectious diseases, evidence for disease surveillance and response systems to facilitate the appropriate uptake and reuse of geographical data.