Quantifying Mobility Perturbation in America's Cities during COVID-19: A Network-Based Approach

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ABSTRACT

The pandemic of COVID-19 has caused severe disruptions in urban lives. Understanding and quantifying these disruptions is important to inform the development of targeted and effective measures to control the pandemic and its impact. One way of achieving this object is to measure the urban mobility perturbation caused by the pandemic. In this study, we built mobility-based networks for seven major metropolitan statistical areas (MSAs) across the United States in the years of 2019 and 2020, respectively. We quantified the disruptions of urban mobility by computing and comparing a set of network-based metrics before and during the pandemic. The proposed approach is able to uncover the impact of COVID-19 in cities and provides new insights into the resilience of cities when facing large-scale disasters.