Modeling the social media information network over space

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This paper takes a data-driven approach to model how social media information diffuses over geographic space to form an information network. Using an innovative variance decomposition of the vector autoregression model (Diebold & Yilmaz, 2009, 2012, 2014) and Hurricane Ida as a case study, we construct a weighted and directed climate disaster information network on Twitter described by an information network adjacency matrix. We further analyze the relative importance of disaster-specific factors, demographics, and pre-existing social networks in explaining the climate disaster information generation and diffusion. We also compare the Twitter information network structure to several social network structures including friendship, mobility, and migration. Our analytical framework can be directly applied to analyze information transmission of other topics on Twitter (e.g., science and public health communication). The online network structure can be linked to offline behaviors to understand social learning in a human network.