

Personal Activity Centres and Geosocial Data Analysis: Combining Big Data with Small Data

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Abstract Understanding how people move and interact within urban settings has been greatly facilitated by the expansion of personal computing and mobile studies. Geosocial data derived from social media applications have the potential to both document how large segments of urban populations move about and use space, as well as how they interact with their environments. In this paper we examine spatial and temporal clustering of individuals' geosocial messages as a way to derive personal activity centres for a subset of Twitter users in the City of Toronto. We compare the two types of clustering, and for a subset of users, compare to actual self-reported activity centres. Our analysis reveals that home locations were detected within 500 m for up to 53% of users using simple spatial clustering methods based on a sample of 16 users. Work locations were detected within 500 m for 33% of users. Additionally, we find that the broader pattern of geosocial footprints indicated that 35% of users have only one activity centre, 30% have two activity centres, and 14% have three activity centres. Tweets about environment were more likely sent from locations other than work and home, and when not directed to another user. These findings indicate activity centres defined from Twitter do relate to general spatial activities, but the limited degree of spatial variability on an individual level limits the applications of geosocial footprints for more detailed analyses of movement patterns in the city.

Keywords Geosocial Personal activity centres, Clustering Spatial analysis

