Understanding Metropolitan Crowd Mobility via Mobile Cellular Accessing Data

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Understanding crowd mobility in a metropolitan area is extremely valuable for city planners and decision makers. However, crowd mobility is a relatively new area of research and has significant technical challenges: lack of large-scale fine-grained data, difficulties in large-scale trajectory processing, and issues with spatial resolution. In this article, we propose a novel approach for analyzing crowd mobility on a "city block" level. We first propose algorithms to detect homes, working places, and stay regions for individual user trajectories. Next, we propose a method for analyzing commute patterns and spatial correlation at a city block level. Using mobile cellular accessing trace data collected from users in Shanghai, we discover commute patterns, spatial correlation rules, as well as a hidden structure of the city based on crowd mobility analysis. Therefore, our proposed methods contribute to our understanding of human mobility in a large metropolitan area.