A Economy and Space

Someone like you: Visualising co-presences of metro riders in Beijing

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Co-presence is a concept and a phenomenon of lasting interest among sociologists and the like (e.g. see Cooley, 1956; Mead, 1934; Zhao, 2003). It has two dimensions: co-presence as mode of being with others and co-presence as sense of being with others (Zhao, 2003). The former emphasizes the physical conditions that 'structure human interaction', whereas the latter stresses the 'subjective experience of being with others' (Zhao, 2003: 445). As cities become more and more populous and widespread, regardless of whether we like it or not, anonymity has become a defining characteristic of our daily lives (Milgram, 1977). Despite such anonymity, there are still recurrent physical co-presences of people in different locales and on different journeys that engender many 'familiar strangers' for us: we only know them by their respective faces and we never interact. They are treated as indispensable part of the environment or scenery (Milgram, 1977). We feel something missing if they are absent. They may look insignificant on the surface whereas are a precondition for more complex and meaningful social interactions that are crucial to a healthy community/city (Gehl, 2011).

Relying on traditional methods such as photographs and interviews, Milgram (1977) quantified and visualised physical co-presences of a small group of train riders at the platform level. Can we replicate that for thousands even millions of urban residents or visitors? It seems to be a daunting task. We are, however, still eager to accomplish it, hoping to acquire such knowledge as where and when co-presences are most likely to occur and what are the characteristics of the "where" and "when". Zhou et al. (2018) were able to quantify and

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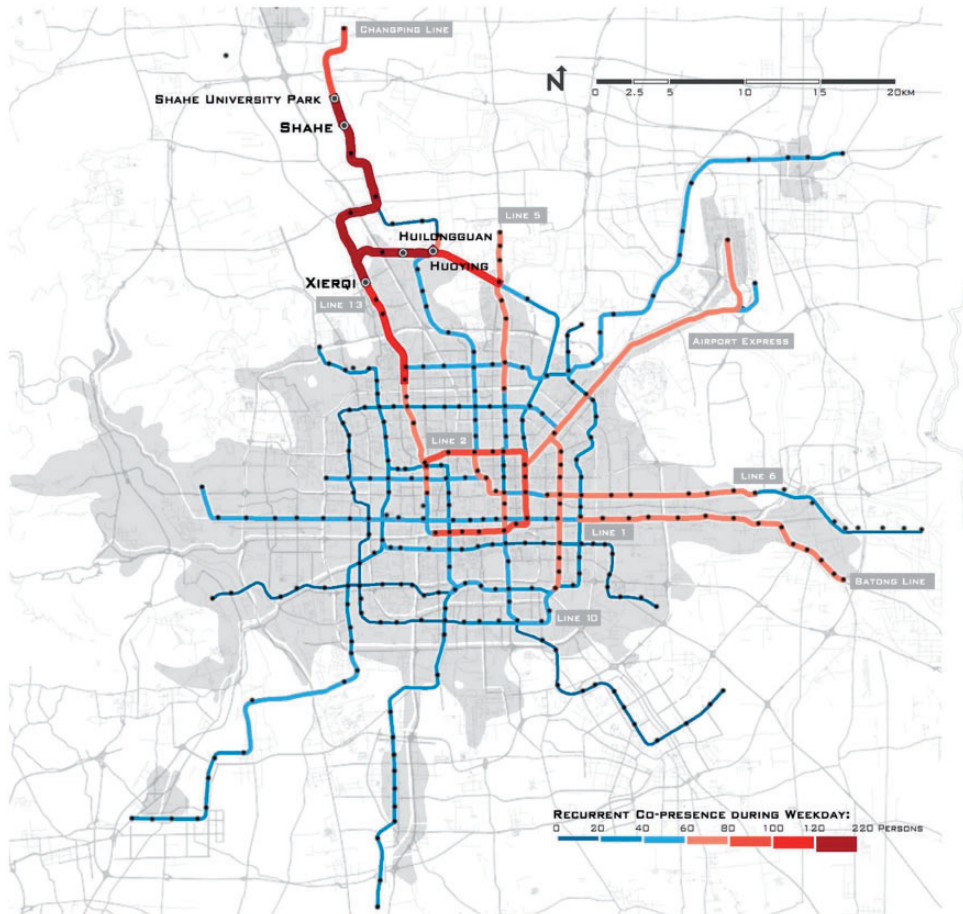Email: zhoujp@hku.hk

Figure 1. Co-presences of metro riders on weekdays.

visualise physical co-presences of metro riders around metro stations in Beijing on a typical weekday. In this essay, we employ their data plus some extra data to quantify and visualise physical co-presences of metro riders along certain routes of the local metro system. In particular, the data we use are smartcard swipe data for the period 10–16 August 2015 and .shp files for local metro lines in operation as of 2015. The data record journeys of about 2.5 million smartcard holders each day. A journey is defined as two actions in sequence for a distinct smartcard: a swipe into Station A at time X1 directly followed by a swipe out of Station B at time X2 and X2 is later than X1. We define co-presence of smartcard holders, i.e. most of the recurrent local metro riders, as those who complete the same journey on the same day, that is, 'someone like you' in terms of trip trajectories (A to B) and times (X1 to X2). Figures 1 and 2 visualise the co-presence of the local metro riders per day on weekdays and on weekends, respectively. The warmer/wider the colour, the more co-presences there were.

Probably the first of their kind in history, the visuals enable us to show and quantify patterns of co-presences of metro riders for Beijing, capital of China as well as an emerging global city with a population of more than 22 million. The patterns have several character-istics. First, weekends and weekdays saw quite different distribution of the co-presences. On weekdays, the metro lines (or line segments) that enjoyed the most co-presences were in
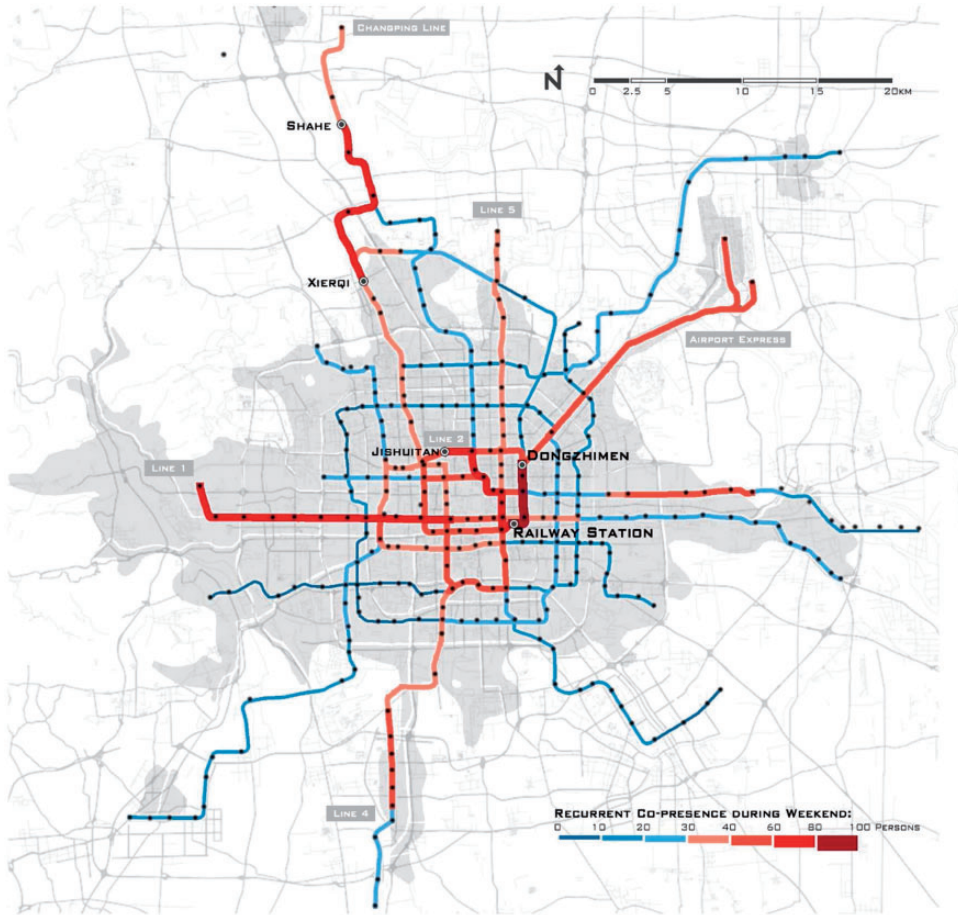
Figure 2. Co-presences of metro riders on weekends.

the northwest. On weekends, the metro lines that enjoyed the most co-presences become more dispersed. They were in/around the centre, in the west as well as in the northwest. Second, there may not be strong correlation between the co-presences and local peak-hour passenger volumes. No. 1, 4 and 10 metro lines, for instance, are notorious for peak-hour congestion. But they did not see the most co-presences either on weekends or weekdays. Third, special-purpose metro lines tend to generate a significant number of co-presences. Most notably, the airport express and Changping lines (a new exurban line) were among the top 10 lines that produce the most co-presences on both weekdays and weekends.

Software
MySQL 8.03; MS Excel 2017; ArcGIS 10.5.1; Photoshop CC.

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