Weibo Footprint: A Web-based Visualization System to Analyzing Spatial-temporal Movement of Geo-tagged Social Media Users

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Introduction

We propose a visualization system allowing users to explore their own trajectories from geo-tagged social media. Our system enables users to understand the global movement trends and spot interesting and memorable behaviors. We can observe many interesting patterns shared by users and their friends. With our tool, we aim to bridge the gap of general public and their understanding of data.
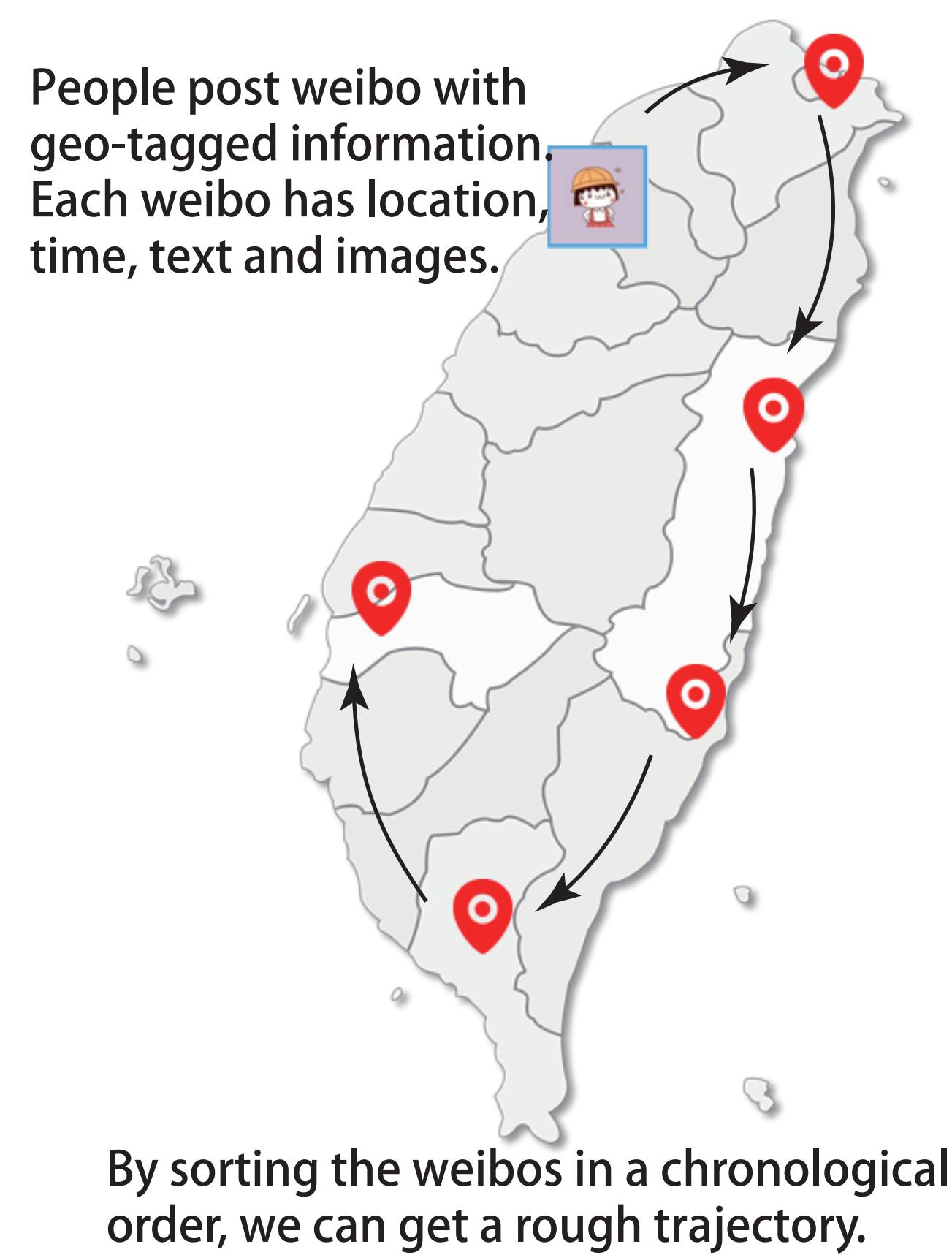
Visualization

Our system has three components, including data authoring, visualization and sharing.
1) The timeline view shows the time histogram of all the geo-tagged weibos.
2) The spatial view provides multiple layers to show people's trajectories with different levels of details. Aggregated and raw routes are shown, with the
3) The distribution timeline of places updates according to people's interactions.
4) The detailed timeline pops up to show the weibo contents in a chronological order.
Through exploratory interactions, users derive many interesting patterns in different periods of time. Furthermore, users could annotate the events, share and invite friends to visualizing their movement.

Data

People post weibo with geo-tagged information. Each weibo has location, time, text and images.

By sorting the weibos in a chronological order, we can get a rough trajectory.

Interactive Exploration

We can drill down the multi-level pattern analysis for one individual user.
a) Country-level Overview (Shanghai and Heilongjiang are highlighted)
b) Drilling down to Shanghai, there are several outstanding positions, including Pudong (210), Yangpu/Hongkou (56) and Xuhui (30) region. The most frequent revisiting pattern is Pudong-Xuhui-Pudong revisiting.
3) In Pudong region, we can drill down to the details of Zhangjiang District, where she went to restaurants, teaching buildings and the dormitory (c).


(a) (b) (c)
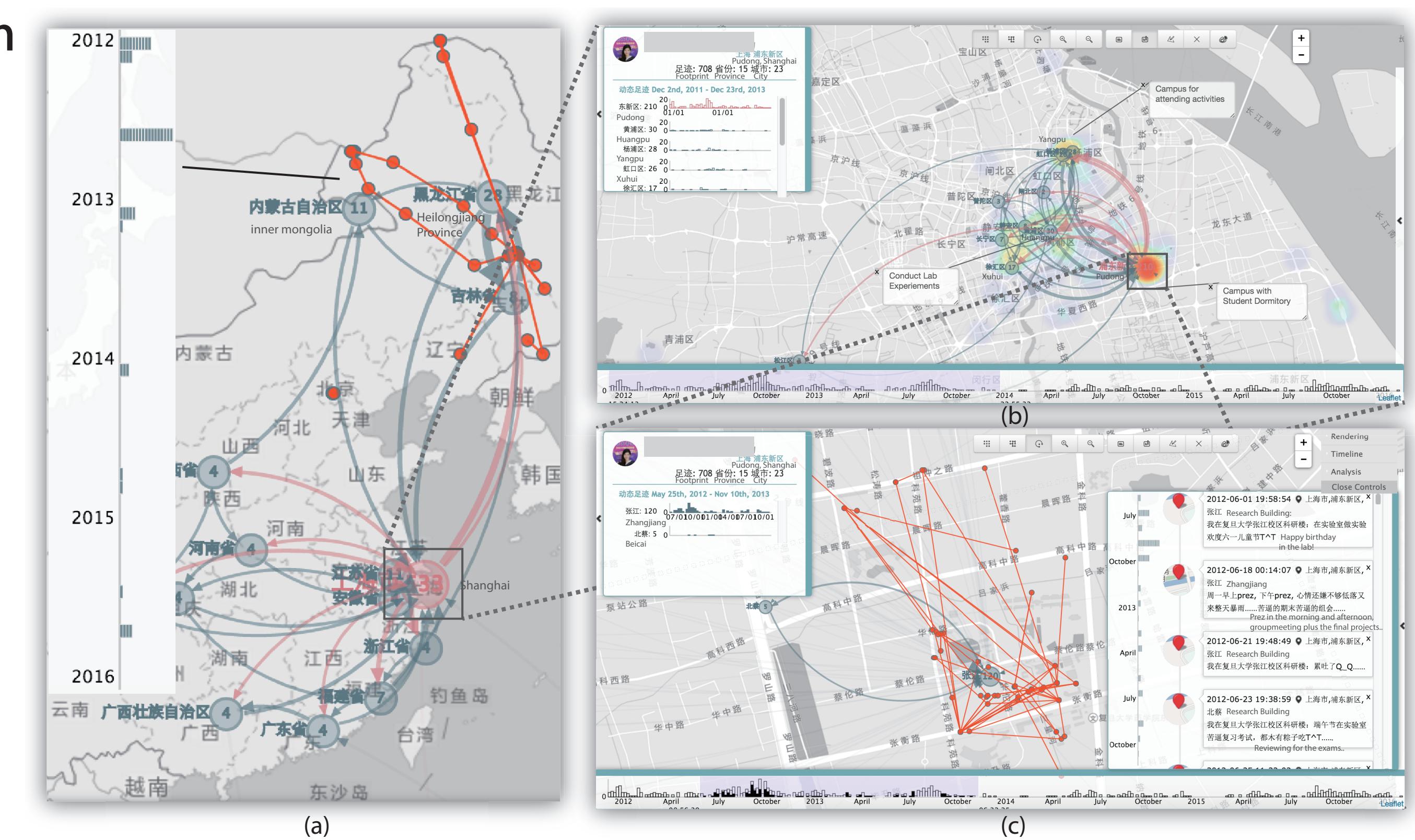
Diverse Movement Patterns

An Academic Researcher's Footprint


(a)
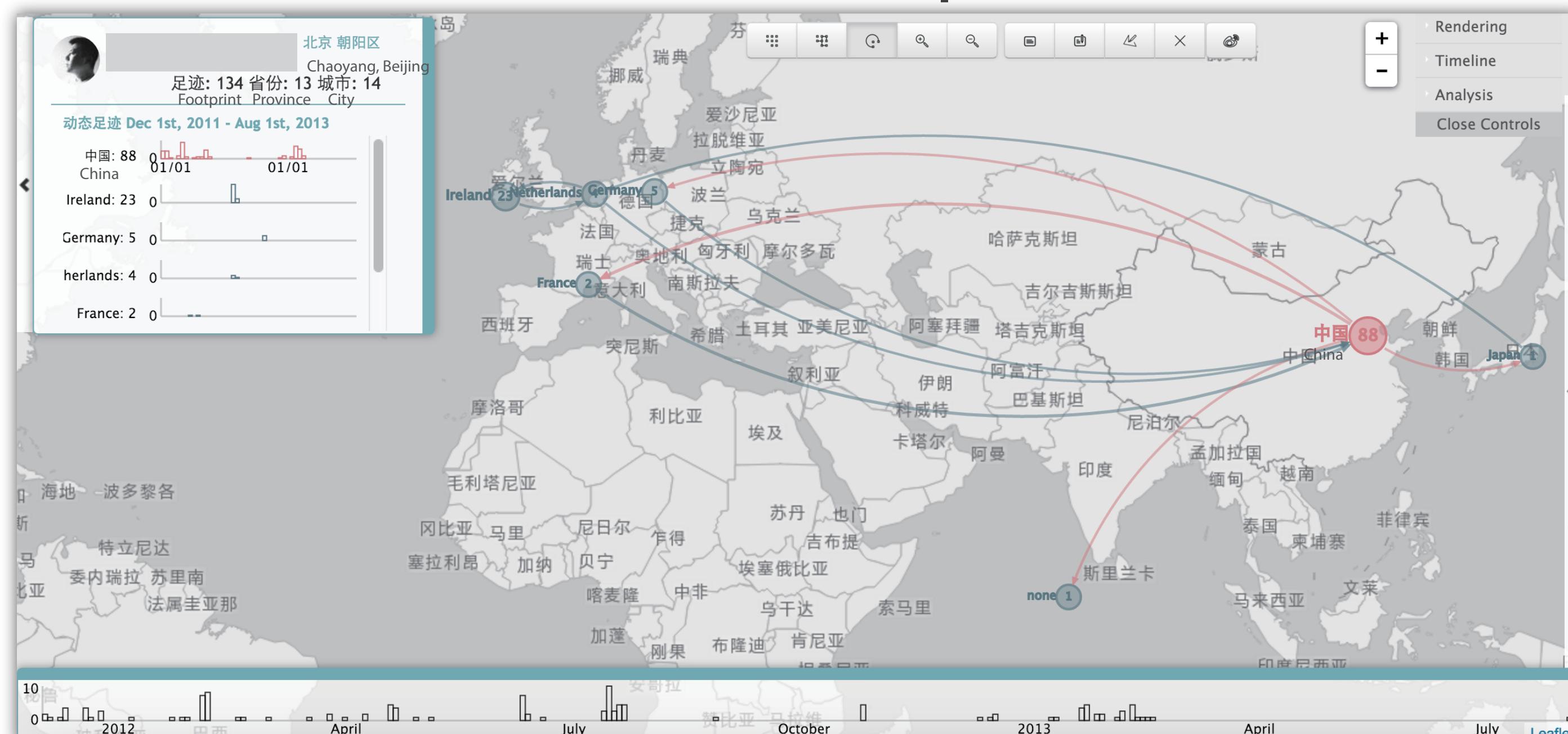
A Pilot's Footprint

(b)
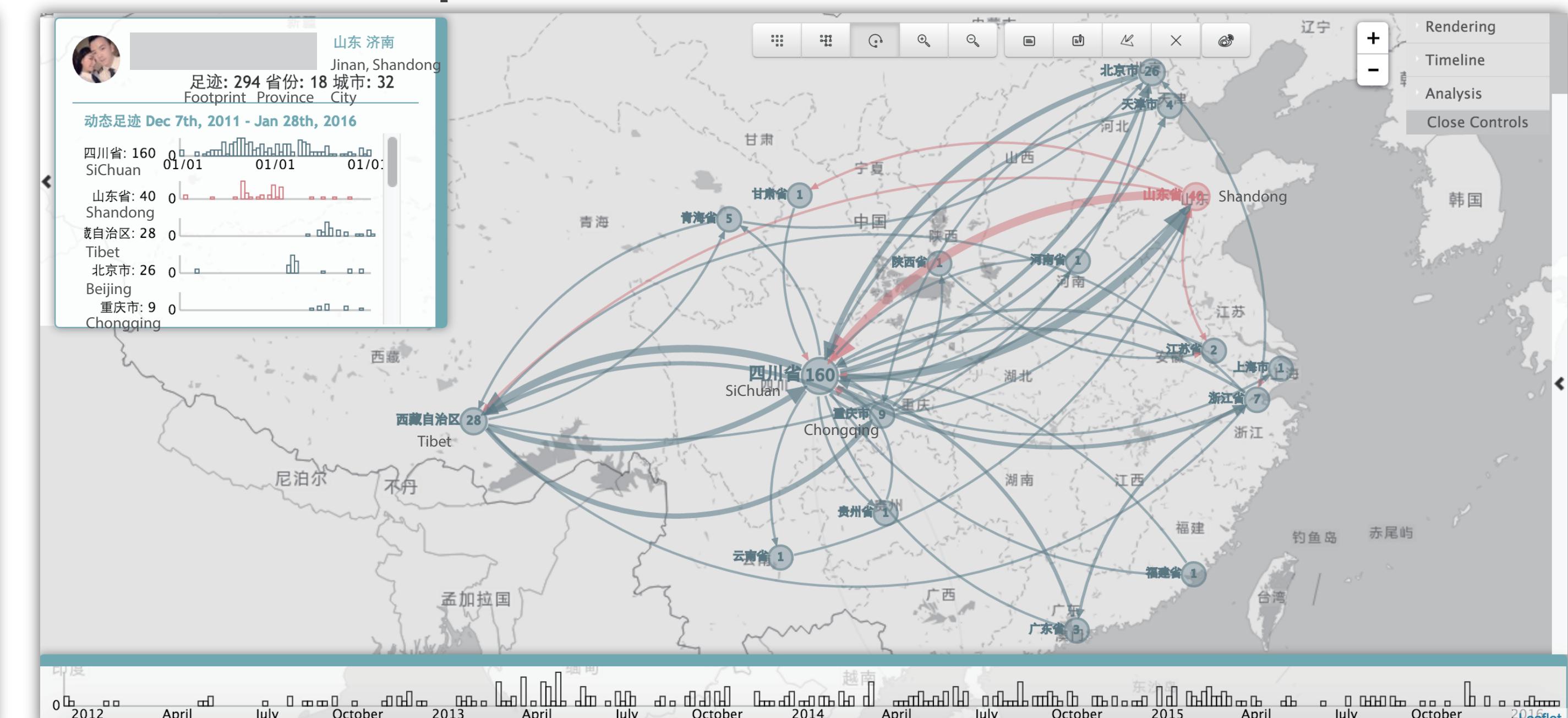
A Traveller's Footprint

(c)
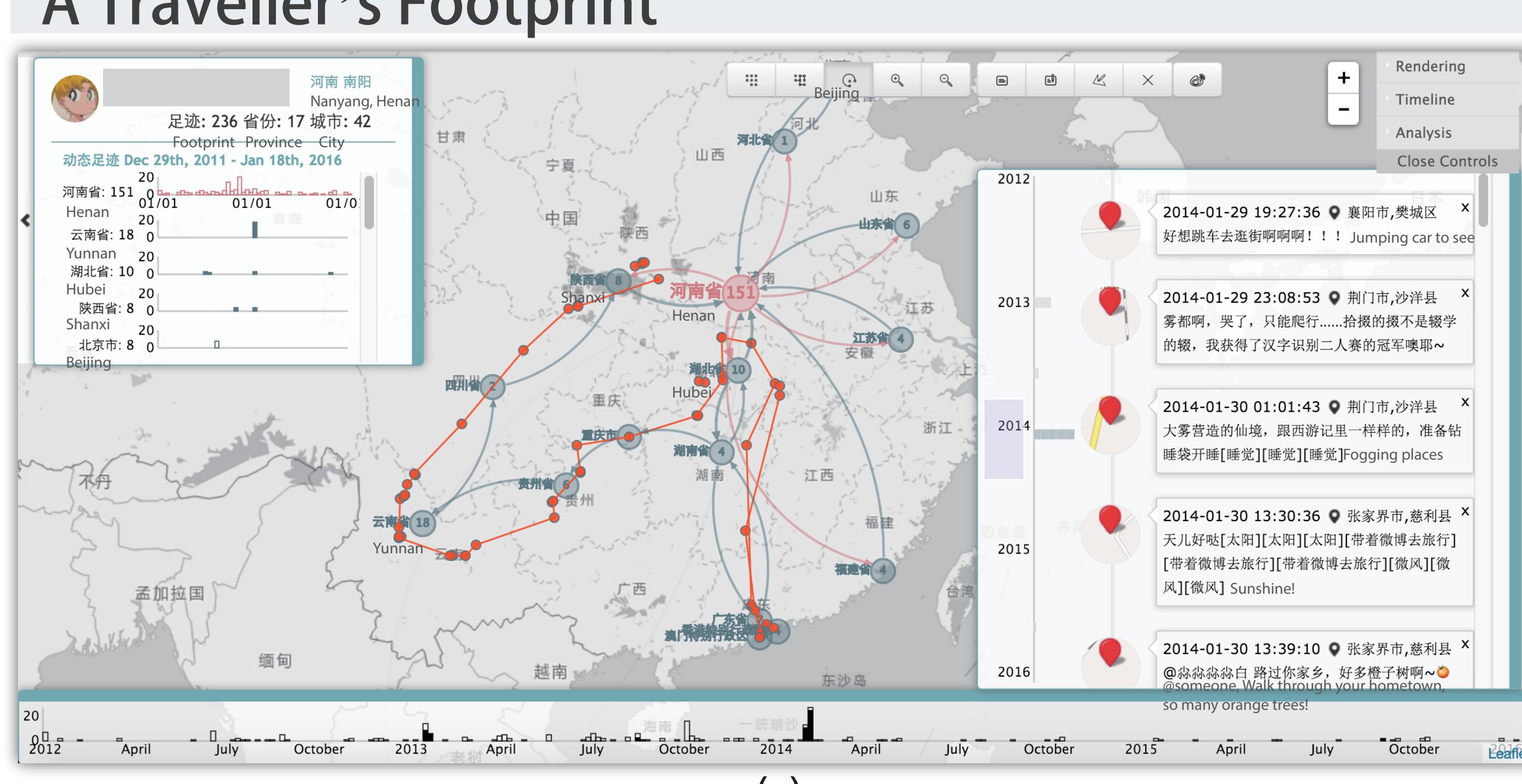
A Nurse's Wroking-Home Pattern

(d)
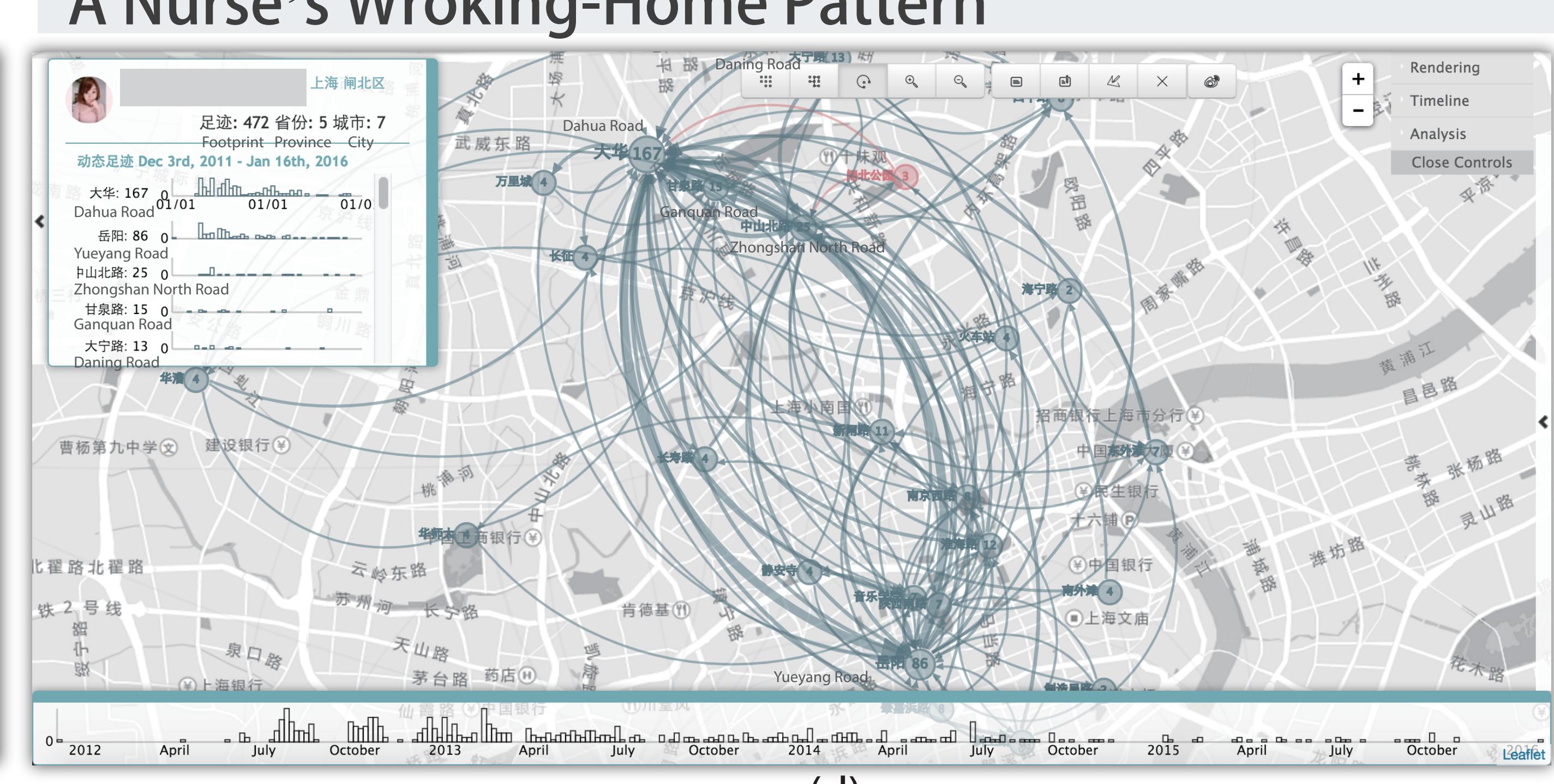
Different characters of individual people's movement.
(a) A academic researcher, visiting different countries to attend conference; (b) A pilot, addressing the general OD pattern of her airline;
(c) A traveler, indicating the traveling routes across multiple places of interest; (d) Work-home revisiting patterns of general people.
Geo-tagged social media acts as sensors recording people's behavior. People could create their own foorprints with different visiting position time and revisiting patterns.

Acknowledgements

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