

# Geospatial Technologies for Human Health and Mobility Research



The University of Tokyo

Date and Time: Friday, July 26<sup>th</sup>, 14:00-16:30

Venue: Room 806, Faculty of Engineering Bldg. 14, The University of Tokyo. @Hongo Campus

(No registration is necessary for the in-person meeting; to attend online, please register at <https://u-tokyo-ac-jp.zoom.us/meeting/register/tZwsdOqvqTgsGNziHMRS-H1bG7DFteJdJRwl>)

## Advanced Geospatial Technologies and Methods for Human Mobility and Health Research

Human mobility is an essential element of people's spatiotemporal experiences, and these complex experiences cannot be fully understood by just looking at where people live. With the advent of new geospatial technologies and methods like GPS tracking and mobile sensing, a vast amount of complex spatiotemporal data can be collected and analyzed. However, human behaviors revealed by these data have not been fully understood. In this presentation, I discuss new methods developed for this purpose and draw upon recent conceptual and methodological developments to examine how a perspective that integrates the spatial and temporal dimensions and takes human mobility into account can help identify the relevant spatiotemporal context that influences people's health behaviors or outcomes. Using examples from my recent projects, I discuss how the collection and analysis of high-resolution space-time data enabled by advanced geospatial and mobile technologies can provide new insights into the relationships between human mobility, health behaviors and the complex spatiotemporal dynamics of environmental influences.



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## Co-location Analysis on Street Networks: Economic and Health Geography Applications

Capturing spatial co-location patterns—subsets of two or more types of events that are geographically close—is one of the primary interests in spatial analysis. To precisely analyze the micro-scale co-location, I recently developed a new statistical measure named network dual K function. Compared to the ordinary cross K function, the proposed methods have distinctive features such as assuming network-constrained space and using an exact statistical formula for a test. In the seminar, we introduce a set of three methods of network dual K function: global, local, and incremental methods. The proposed methods were applied to various types of stores in trendy districts in Tokyo to demonstrate the usefulness of the methods for studies on economic geography, and to improve our understanding of urban agglomeration. In addition, using a simpler method, I examined the association between spatial accessibility to grocery stores and older people's daily step counts in Yokohama, Japan. This study, the co-location analysis for walkability research, provided insights into neighborhood environments affecting human walkability.



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