

# We Know Where You Are: In Space and Place - Enriching the Geographical Context through Social Media

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## ABSTRACT

The convergence of social media and GIS provides an opportunity to reconcile space-based GIS and place-based social media. For this purpose, the authors conduct an empirical study in Columbus, Ohio, aiming to enrich both the spatial and platial context of geo-tagged data, using location-based social media Foursquare checkins as an example. An exploratory analytical approached is used to enrich the geographic context of social media data in both space and place. Specifically, exploratory spatial data analysis and point of interest matching are applied to analyze about 50,000 checkins crawled from social media feeds. It is found that checkins tend to be spatially clustered near the center of the city. Popular places related to food, services, and retail shopping venues are more likely to be reported by social media users. The authors also conducted platial analysis of the top 25 popular place venues in the study area.

## KEYWORDS

Place, Social Media, Space

## 1. INTRODUCTION

Space and place are two fundamental concepts in geography that together define geographers' view on the world (Tuan, 1977). Both concepts have a long history in geography and related disciplines. Scholars in multiple fields throughout the history have developed a voluminous literature on conceptualizations of space and place (Wainwright and Barnes, 2009; Agnew, 2011; Casey, 2013). Conceptually space is often related to an abstract view perceived as a "top-down" while place is related to be a more concrete one considered as a "bottom-up" (Agnew, 2005; Sui, 2011). Partial

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focus on either space or place might serve as an impediment to a more holistic understanding of the world from a geographic perspective (Sui, 2011).

The difference between space and place has been mainly discussed by human geographers, but received little attention in GIScience as these two words have been used interchangeably in the GIScience literature. In fact, until recently the space perspective has dominated GIS and geographic objects are mainly represented using Euclidean geometry and Cartesian coordinate system (Sui, 2011). In contrast to space, place can be considered as a “bottom-up” view that focuses on capturing the local environment and human activity in a qualitative manner (Sui, 2011). Some pilot work has begun in shifting from space to place in GIS practices (Goodchild, 2011). Indeed, how to incorporate place into GIScience will be both interesting and challenging.

The convergence of social media and GIS (Sui & Goodchild, 2011) provides an opportunity to reconcile the world of space (traditional GIS) and the world of place (social media). Until recently all geographic information was produced mainly through a top-down process by government mapping agencies or corporations in the mapping industry. The emergence of social media such as Twitter, Facebook and Foursquare and the widespread adoption of GPS-enabled tagging of social media content provide new opportunities for us to study activities of people from a place perspective. These internet-based micro-blogging applications allow users to post and read short messages related to local environment through a shared social connection (Boyd and Ellison 2008). Such data usually present with fine spatial-temporal granularity and sometimes have rich context such as text, photos and other qualitative information. The geography of social media data such as the user or messaging location is invaluable for researchers to link where we are to what we do or feel, using real-time or archived data.

Spatially identifying user-generated conversations on social media may implement policy more effectively to where the targeted audiences live (Ghosh and Guha, 2013). Scellato et al. (2011) try to predict social link by detecting user patterns in Foursquare, a popular location-based social network. In addition, Cramer et al. (2011) aim to discern users' location sharing patterns from the individual user's perspective. As Jiang and Miao (2014) argue, “Location-based social media enable users to track individual historical trajectories, their friends, and even the growth of social media. Unlike with conventional cities, the trajectories of social media are well documented by the hosting companies; and unlike conventional census data, social media data is defined at individual level, often at very fine spatial and temporal scales” (page 2). The explosive growth of location-based social media in recent years provides us an unprecedented opportunity to explore human activities in both space and place.

In this article, social media data are crawled from a location-based service website Foursquare<sup>1</sup>. The goal of this paper is to conduct an empirical study in the GIS environment aiming to enrich both the spatial and platial context of social media data, using checkins as an example. We explore three main research questions:

- What spatial patterns are discernible with regard to social media checkins in Columbus, Ohio?
- In what urban places are social media users actively engaging in the creation of online checkins?
- What light do these social media checkin activities shed on understanding place as a “meaningful location”?

The rest of this paper is organized as follows: section two discusses the history of the terms “space” and “place” by exploring theoretical meanings and setting the context for which the terms will be used in this paper. In section three we present the study area, methods and data of our case study. We then proceed to demonstrate the results of empirical studies in section four along with our discussion, followed by summary and discussions on future work in the last section.

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