Automating Volunteered Geographic Information Systems in Social Media: Theorizing VGI as Geodemographic Surveillance

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Abstract

This paper considers Volunteered Geographic Information (VGI), in particular the application of geotagging in social media photographs, as an emerging form of geodemographic consumer surveillance. Although the geoweb is typically framed within a context of participatory engagement with geospatial data by non-expert cartographers (Goodchild 2007; Elwood 2008), scholars have articulated the need to consider the political economy of the geoweb (Leszczynski 2012), as well as a critical discussion of the rhetoric of voluntary information and participation (Tulloch 2008; Elwood 2008). Outside of GIS, scholars have likewise theorized the changing infrastructural configuration of new media interactivity through automated surveillance and social sorting (Andrejevic 2005; Beer 2010; Graham and Wood 2003). This paper seeks to provide a theoretical contribution to VGI contextualizing it within a larger shift in social media infrastructure. It specifically traces the development of Facebook's use of geotagging as it relates to the production of geospatial data through mobile phone photography, particularly as new technical affordances allow for the automated geotagging of GPS data in photographic metadata. It argues that VGI practices embedded within private social media sites are encouraging the automated collection geospatial knowledge in order to realize geodemographic information, thereby inferring knowledge of consumer lifestyles and tastes (Burrows and Gane 2006; Phillips and Curry 2003).

Background and Relevance

The primary purpose of this research is to create a theoretical framework for analyzing the production of geographic knowledge in social media platforms through automated surveillance techniques. It does so specifically by analyzing how geographic knowledge is increasingly embedded within a dialectical process of volunteered participation and automated collection. In this respect, this research is informed by interdisciplinary approaches such as surveillance studies and communicative geography (Lyon 2003; Adams and Jansson 2012). Although some geoweb scholars have argued the need to move "beyond the geotag" with respect to its methodological and explanatory value (Crampton, Graham, Poorthuis, Shelton, Stephens, Wilson and Zook 2013), social media continues to push for the geotagging of social media content, suggesting that the geotag still deserves critical scholarly attention. In this respect, the move towards social media geotagging contains some elements of VGI principles, however, it is also the case that when considered as a form of consumer surveillance and value production, VGI practices become inherently complicated by a politic of interactivity, suggesting the need for a more nuanced conceptual framework.

The geoweb emphasizes the central role of non-experts in producing contemporary cartographic knowledge, including through the voluntary participation of everyday users of geospatial media (Goodchild 2007; Elwood 2008). This has brought forth discussions surrounding the political economy of the geoweb, and with this an understanding of the power dynamics of spatial data creation, participation, and use (Leszczynski 2012; Tulloch 2008; Elwood 2010). Although the geoweb has tended to be represented by open forms of community and civic engagement with producing geospatial data, particularly in order to empower marginalized communities (Elwood 2006; 2008), it is worthwhile to point out that the private sector has likewise been engaged in developing applications which might broadly fall under the geoweb, particularly within mobile information systems such as location based services (LBS), which incorporate space and place into the routine production of social media content (Humphreys 2007; Goggin 2012; de Souza e Silva and Firth 2010). The hybridization of photography and LBS such as through Instagram has likewise been proposed as a key everyday information practice wherein geotagging is increasingly on by default, transforming everyday spatial relations and understandings (Hjorth and Pink 2013).

This suggests that photography in social media is increasingly being used as a mechanism for extracting geospatial data, and therefore indicating a future area for theorizing the geoweb in commercial social media, particularly as social media as a commercial endeavour is engaged in creating geodemographic knowledge of consumer lifestyles through consumer profiling. Geotagging photographs in social media draws attention to the ways in which geolocation is increasingly automated within social media content primarily as a form of extracting surplus value from web 2.0 content production methods by maximizing the surveillance of users (Fuchs 2011). Moreover, there is evidence to suggest that the notion of voluntary participation in VGI requires further analysis and nuance (Elwood, Goodchild & Sui 2012). Thus, the purpose here is to theorize why commercial social media would be interested in automating the production of geospatial data; the automated geotagging of photographs therefore serves as an ideal example to illustrate

Geodemographic knowledge of consumer lifestyles, preferences, and tastes is a key commercial application of Geographic Information Systems (GIS), typically in order to segment populations into particular categories and markets. Historically, commercial techniques of geodemographic market segmentation have fixated around residential location, typically relying on postal codes to understand the lifestyles and behaviours of its inhabitants (Harris, Sleight and Webber 2005). The success of this method of producing knowledge about populations, which contains information about income, education, ethnicity, age, and other social variables, has stimulated new research priorities for the social sciences, particularly inter-disciplinary work in communicative geography, software studies, and surveillance studies (Adams and Jansson 2012; Dodge and Kitchin 2005; Lyon 2003). Underlying this call for future research into GIS stems a growing concern about the status of empirical sociology, sample-based research methods and epistemologies, and the capacity for the private sector to develop concise understand-

ings of populations based on access to large quantities of data (Savage and Burrows 2007). Scholars have specifically highlighted the need to develop research into the spatialization of class, particularly in order to understand the clustering of people into homogenous spaces, and the role of information technology in producing geocoded knowledge about these spaces and populations (Parker, Uprichard & Burrows 2007; Burrows and Gane 2006).

The spatialization of class arguably can be observed as undergoing new modulations through VGI systems and social media. Geotagging and location based services are perhaps the two dominant modes for producing or extracting geospatial information from social media content. Increasingly we see new media platforms, which typically rely on user-generated content for producing value, embedding features such as check-ins or geotagging into its content production platforms and metadata. Likewise, geolocative social media has come to occupy a particularly unique position in the field of mobile social media wherein content distribution and consumer analytics are increasingly premised upon geospatial data (Humphreys 2007; de Souza e Silva and Firth 2010). The unabated move towards what we might call the 'geocoding' of social media indicates first that geography still matters in everyday life, but moreover that the private sector is turning to geospatial media for producing surplus value from content. Thus, there is a certain imperative that research into VGI consider the underlying political economy which drives the scope and direction of media (Leszczynski 2012; Mosco 2009).

Methods and Data

Because this study is both exploratory and in its infancy, the focus is thus on theorizing geocoding in social media by focusing specifically on embedding VGI in political economy. However, it is likewise important to demonstrate the application of theory onto empirically observable instances. This research will therefore explore contemporary developments in social media to analyze their appropriation of geocoding in order to sketch out an analytical framework of geocoding. This research will draw on ethnographic approaches to software studies and infrastructure (Star 1999; Dodge and Kichin 2005) to explore how geocoding and VGI principles are embedded in social media. Using Facebook's Places as a case study, data collected includes first a broad overview of the social media interface, exploring the social affordances for geotagging content. Second, Facebook Places is explored in detail through a discourse analysis of key posts and documents released by Facebook Engineering, as well as secondary sources which have sought to comment or critique Facebook's push to geotag content. In doing so, a brief history of Facebook Places is offered in order to theorize the move towards automated forms of geotagging.

Results

Initial observations suggest that it is possible theorize the geocoding of social media using two complimentary analytical modes of spatial knowledge production. The first con-

cerns the self-coding of space by individuals and groups. That is, it denotes a series of 'vernacular methods' by which users are placing space as an important organizational framework to the production of self-narratives and the performance of identity online (Phillips 2006). Self-coding as an analytical framework can therefore denote a mode of information extraction in which individuals are free to code space in ways they see fit, and in some respects represents an ideal type conceptualization of VGI ontologies. This emphasis on the move towards self-surveillance and self-governing forms of online performance is essential to consider primarily because geoweb scholarship into surveillance has arguably situated surveillance in relation to its implications for privacy (Elwood and Leszczynski 2011). It is moreover the case that privacy as a concept has a long and complex history with multiple meanings and interpretations (Bennett and Raab 2006). Therefore, the emphasis on vernacular methods of online presentation suggest the need to transcend privacy and consider surveillance within a larger institutional mode of identity management and performance.

The second mode of spatial knowledge production concerns the automation of geospatial data in which space and place are automatically logged by the infrastructure, and does so through automated protocols of surveillance and social sorting (Wood and Graham 2003; Lyon 2003). Increasingly, we find this mode, which we might call 'automated-coding,' penetrating into social media. However, it is not yet clear whether one can argue that automated coding methods are replacing VGI. At best, we might argue this to represent a 'mutual augmentation' of surveillance (Trottier 2012). In the case of Facebook Places, a key institutional shift can be observed in the amount of control users can exert over geotagged content since its inception in 2010. Whereas the "first generation" of Facebook Places offered users the ability to disable geotagging, the current installation of Facebook Places will only allow users to remove geotags after they have been recorded on the map. Additionally, users must manually remove geotags, point by points; there is no option to remove all tags at once. This process can actually prove to be quite difficult if a user is tagged in several dozen instances, and moreover means that the user has to remove themselves completely from the post. This means that users do not have the option to remain tagged, but not geotagged, from a post; Facebook has redesigned its Places arguably in order to make it quite difficult if not pragmatically impossible to un-tag one's geolocation.

In the case of mobile phone photography, it is also worth considering how changes at the infrastructural level are encouraging users to automate geotagging, making it part of the 'background' of routine digital content production. Recent developments in mobile operating systems, such as iOS7, have allowed users to automatically embed geospatial data into the photograph's EXIF metadata. Facebook, as well as other social networking sites such as Twitter, have capitalized upon this with their mobile applications. This means that, provided users have allowed their mobile phone camera to automatically record geospatial data through GPS, social media sites can now automatically embed geotags into social media content, in many respects reflecting some of Andrejevic's (2005; 2007) concerns about digital enclosures as automating certain practices of consumer surveillance. Theoretically, it is possible to see how social networks are making it

increasingly difficult to not embed geotagging into content, suggesting that it is increasingly becoming a key part of their business model for extracting commercially relevant data about its users. As Facebook itself has claimed, the goal is to make location tagging "universal" (Mangla 2012); built, in other words, in to all aspects of content production allowing for the ubiquitous mapping of space and place by volunteered and automated practice of geotagging.

Conclusions

The primary purpose of this research is to begin to theorize VGI in social media which acknowledges the increasing automation of geocoding in content production systems as part of a larger trend in consumer surveillance. At the same time, the research project does not necessarily negate the voluntary and participatory processes which structure VGI, but instead recognizes that there is a certain element of mutual augmentation between automated and vernacular practices which influences decisions to geocode social media content. The initial analysis offered here into the geotagging of photographs on Facebook Places, coupled with infrastructural trends to make geotagging part of the 'background' of routine mobile phone photography thus helps to reveal how users are increasingly encouraged, if not required to produce geospatial data about themselves as a means of extracting surplus value for commodifying social media data. This in many respects contributes to contemporary discussions about new media labour and the production of value (Fuchs 2011; Terranova 2000), as well as the increasing role of spatial maps in organizing sociological data (Savage and Burrows 2006). However, the focus here is to theorize the complimentary practices of geotagging. A core argument thus advanced is that there are good reasons to critique the extent to which we can call VGI in social media a volunteered system of knowledge production. Instead, a deeper politic both concerning the production of self-knowledge, and in turn the commodification of that geographic information into economic value, suggests that VGI practices such as geotagging are increasingly becoming a necessary if not entirely coerced engagement with participating in social media and digital culture.

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