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Introduction: Spatial Big Data and Everyday Life

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Introduction: Spatial Big Data and Everyday Life

Commentary

Introduction: Spatial Big Data and everyday life

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Abstract
Spatial Big Data—be this natively geocoded content, geographical metadata, or data that itself refers to spaces and places—has become a pervasive presence in the spaces and practices of everyday life. Beyond preoccupations with "the geotag" and with mapping geocoded social media content, this special theme explores what it means to encounter and experience spatial Big Data as a quotidian phenomenon that is both *spatial*, characterized by and enacting of material spatialities, and *spatializing*, configuring relations between subjects, objects, and spaces in new and unprecedented ways.

Keywords
Spatial Big Data, everyday, anxiety, social media, geotag

Everyday spatial Big Data

It has been estimated that up to 80% of Big Data is "spatial" insofar as it is characterized by a locational component (Farmer and Pozdnoukhov, 2012; Folger, 2011), be this spatial coordinates, geographical meta-data, an associated street address, or where the content of data events themselves make reference to a place in physical space. This claim as to 80% of data productions being spatial in nature however predates the Big Data present; it was first made by Antenucci in 1989. To say that data is and has always already been spatial is therefore neither novel nor original. What, then, is it that is being made actual in spatial Big Data? This is the subject of the papers assembled here. This special theme arose from a series of sessions on "Spatial Big Data and Everyday Life" organized at the Association of American Geographers (AAG) annual conference in Chicago in 2015. There were two questions which motivated us: what difference does it make to conceptualize a specifically *spatial* Big Data as opposed to Big Data per se; and second, how does spatial Big Data play out, and with what effects, at the level of the everyday? Each of the papers advances unique responses to these questions, approaching spatial Big Data through multiple epistemological and theoretical lenses that offer up diverse interpretations of the spatiality of Big Data and its everydayness.

As a colloquial designator, "everyday" has connotations of ordinary, quotidian, and frequent. As articulated by Taylor et al. (2014), data has become entirely ordinary and expected presences in the spaces and practices of everyday life. Certainly, data has always been produced *in* places, by actors—both human and other than human—occupying those spaces. Many Big Data productions and attendant analytics regimes have their precursors in identifiably spatial/geographical antecedents. For example, location-based advertising, premised on the aggregation of individual spatial histories, real-time locations, and past consumptive behaviors, emerged from geodemographic information systems (GDIS), which coupled geodemographic analytics to interfaces of geographic information systems (Dalton and Thatcher, 2015). GDIS' themselves grew out of what Bouk (2015) refers to as "massifying" data practices of the 20th century, particularly those of mass marketing. Yet the "routine, taken-for granted" presence of geocoded and geolocatable content (data)

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"in homes, neighborhoods and communities" (Dyck, 2005: 234)—or what Taylor et al. (2014) alternatively call "the street"—is entirely unprecedented by previous socio-technical geographic information technology assemblages, genres of techno-cultural productions, or praxes. From the scale of the city (Graham, 2013) to that of the street (Taylor et al., 2014) and increasingly reaching into the intimate spaces of the home (Speed and Luger, 2014), our physical, emotional, and imagined landscapes, as well as our experiences of these spaces, are constituted, augmented, and mediated by data (Leszczynski, 2015b).

Our understanding of the spatial everyday is accordingly further informed by Berlant's (2011) observation that the present is not an object, but a "mediated affect." Importantly for Berlant, the everyday is also a series of ways of addressing anxieties, not as crises that create radical breaks, but as intensifications of already existing situations, what she calls "crisis ordinariness," wherein: "[c]risis is not exceptional to history of consciousness but [is] a process embedded in the ordinary that unfolds in stories about navigating what's overwhelming" (10).

In this sense, we advance spatial Big Data as an intensification of two related anxieties: (i) anxieties around data itself (what we term "data anxieties"), and (ii) anxieties latent in subjective individuation and the governance of subjects.

Everyday anxieties

The rise of spatial Big Data is intimately bound up with twinned anxieties around data: that of data being insufficient for tasks at hand, while simultaneously being over-sufficient). Kate Crawford (2014) discusses this in terms of the double fear of *not* being abstracted into data flows and consequently being "left out" of algorithmic socio-spatial sorting praxes which increasingly structure access to life opportunities, *and* that associated with the consequences of actually *being* abstracted into and algorithmically reassembled across data flows in ways that are overly revealing of the personal details of our most intimate selves. The public disclosures of the extensive data-driven surveillance practices of the securities agencies—many of which involve the capture, interception, and aggregation of specifically *locational* information about individuals—have engendered societal "anxieties of control" whereby individuals wish to direct and maintain the integrity of flows of their personal locational data at the level of devices, applications, and platforms, but overwhelmingly feel that any attempts to do so are effectively futile (Leszczynski, 2015a).

At the same time, Big Data, spatial and otherwise, is implicated within new modes of subject formation and

subjectivity that allow for nascent data practices of assembling and disassembling subjects, as well as targeting individuals within data-driven practices of surveillance (Tufekci, 2014) and location-based advertising (Dalton and Thatcher, 2015). Accordingly, a second circuit of intensification may be identified around the targeting and governance of subjects. Building on Foucault (2008), spatial Big Data it is created "at the interface of governors and governed . . . an element of transactional reality in the history of governmental technologies, a transactional reality which seems to . . . be absolutely correlative to the form of governmental technology we call liberalism" (297).

Subjects come to be individuated as data such that they may be governed in new ways through individual modes of subjective targeting (Amoore, 2011), but not governed too much such that data effects forms of "soft" rather than overt control (see Sadowski and Pasquale, 2015). Importantly, the data of governance—behaviors, negotiations, tactics, deals, computations, interactions with subjects and other lively objects—is transactions (of behavior, negotiation, computation, interaction, etc.) rather than simply attributes at locations (geotags). Spatial Big Data is a *representational* solution to capturing these interactions for a wide variety of purposes in a (neo)liberal market, through the capture of subjects and subjectivities as derivatives and data doubles (Amoore, 2011) that allow for new modes of highly targeted and individualized geosurveillance practices. Its biggest challenge may be in entering precisely that sphere of the "thinking-feeling" subject rather than just the "signifying-subjectifying" one (Anderson, 2015: 3).

In other words, there is an anxiety around spatial Big Data being able to cope with affects, which necessitate an expansion of the limited interpretation of the "spatial" in spatial Big Data' as geographical referents (coordinates, metadata, address, content) that may be attached to data events, or which are somehow intrinsic to data productions and flows (Crampton et al., 2013; Shelton, 2016). The papers that comprise this special theme do so by going not only "beyond the geotag," but also beyond the narrow engagement of easily available social media content as a source of spatial Big Data for analysis, mapping, methodological innovation, and theoretical engagement.

Beyond the geotag, beyond social media data

We do not mean to suggest that the now pervasive geocoding of content is not significant. Indeed, it importantly constitutes new sources of data previously unavailable for the identification and analysis of various kinds of socio-spatial processes, such as daytime

racial segregation in American cities (Shelton et al., 2015). Nevertheless, a fixation on "the geotag" engenders a fetishization of data that is mapped or mappable, betraying an implicit commitment to a spatial ontology underwritten by a "Cartesian ideal of space as divorced from social relations" that engenders an "over-privileg[ing of] the single latitude/longitude coordinate pair" (Shelton, 2016: 4, 3). Such fixations on the geotag undergird falsely universal claims about the world and the people who inhabit it drawn on the basis of what is non-representative data generated piecemeal by individuals who represent both selective and self-selecting populations. Given that small percentages of individuals in any one country are Twitter users, and only 1% of Tweets are natively geocoded, geocoded Tweets are *not*, for example, valid or meaningful proxies of global mobility patterns, contra for example Hawelka et al. (2014). Elsewhere, animated ectoplasm maps of trending topics on Twitter—such as those mentioning racialized police brutality culminating in police shooting of Michael Brown and subsequent organized activities in Ferguson, MI—promote an understanding of these events as "novel and fleeting" rather than as the gradual outcomes of social inequalities and disaffections rooted in the historical legacies and historical geographies of racial segregation and Jim Crow in the American South (Shelton, 2016: 6).

As Crampton et al. (2013) and Shelton (2016) vociferously argue, we must accordingly go "beyond the geotag" and attendant "burger cartographies"[1] by being attuned to and accounting for the social, political, economic, and cultural contexts of spatial Big Data production, circulation, capture, assembly, analysis, and visualization (see also boyd and Crawford, 2012; Graham and Shelton, 2013; Wilson, 2014). Crampton et al. (2013) provide a five-pronged heuristic that may serve as a framework for a nuanced engagement of geocoded social media content. They encourage scholars and researchers to "go beyond" (i) the "x,y" of data that is natively spatial, by, for example, identifying locations of retweets; (ii) the spatialities of the present, by examining the space–times of data diffusion; (iii) the proximate, by being attuned to the relationalities of data productions and flows; (iv) the human, by including content generated by the other than human, namely bots; and (v) user-generated data, by contextualizing, reading, and analyzing these productions against ancillary data sources (such as census data). Shelton (2016) expounds on this by advocating for a relational approach to geotagged social media data. At the most basic level, this does not involve changing the way that such data is mapped (represented) per se but instead emphasizes how geocoded spatial media content is collected and filtered by, for example, normalizing the selection of tweets relating to a particular topic by tweet density (all Twitter activity). More complex methodologies are available, such as calculating the confidence interval of an odds ratio, which give greater weight to locations characterized by heightened levels of Twitter activity which also experience greater relative degrees of tweeting about a particular topic (for examples of this approach, see Poorthuis et al., 2016; Shelton et al., 2014, 2015).

While these entreaties for going "beyond the geotag" provide robust methodological imperatives for transcending superficial fetishization of locational coordinate pairs, they themselves nevertheless overemphasize (geocoded) social media data. In the same ways that "the geotag" represents a limited facet of social content, geocoded social media data is likewise an instance of, but not sufficient for, the assemblage of data productions, presences, and practices that constitute and fall within the rubric of "spatial Big Data." In convening this special theme on spatial Big Data, we strive to go beyond not only the geotag, but also the fixation on social media content. The contributions brought together here do precisely this by engaging and interpreting the spatiality of (spatial) Big Data in nuanced through variegated ways.

Thatcher calls for attention to be given to the subjects producing spatial Big Data through quotidian engagements with location-aware and -enabled mobile devices as an object of research and scholarly attention. As he rightly argues, too often emphasis has been given to the content productions themselves (e.g., natively geocoded Tweets) rather than the subjectivities and subject positionalities of the individuals actively (and at other times passively) generating spatial Big Data. This importantly signals imperatives for research which, because they are methodologically and empirically far more challenging to address, remain open: how are individuals contending and reconciling with the realities of living in a (spatial) Big Data present? (Couldry and Powell, 2014; Leszczynski, 2015a). Beginning to unpack the nature of the "experience of Big Data" (Crawford, 2014) demands engagement with subjects and subjectivities as of course there is no such thing as universal experience; all experience is contingent on subject positionality. African-American communities, for instance, have long been subject to extensive regimes and practices of historical dataveillance that have reified and shaped material subjectivities and everyday lives along racial lines (Browne, 2015).

It is precisely to this question of what data mean to ordinary people on the street that Wilmott speaks to in her ethnography of embodied spatial experiences of locative media in the historical and geographical contexts of Sydney and Hong Kong. She presents multiple narratives that capture the ways in which Big Data is not only something that is located in space (has a

spatiality or geography), but something that simultaneously actively locates. The quotidian experience of spatial Big Data is thus always one of being located; or, alternatively, of the anxieties of *not* being located or of being unable to locate oneself in space, of intimately experiencing one's subjective erasure from the map-based interface, as recounted by an Aborigine interview subject in Sydney who identified the instrumentalist representation of space to be incongruous with Aborigine identity, claims to, senses of, and experiences of place. The subjective experience of being located is furthermore often one that is incomplete, an incompleteness that is rendered acute when spatial Big Data fails to accurately or effectively situate the subject in space.

Big Data, in other words, is neither total nor totalizing—it is, as per Straube, not a "singular formation." Straube resists the reducibility of complex Big Data infrastructures to a monolithic phenomenon or entity through the model of the stack by tracing the "spatial life" of the version control system Git. As defined by Straube, the stack is "a natively technical framework to think conceptually about the various layers of protocols, code, and data formats involves in the functioning of" digital networked data infrastructures. It provides a means for unpacking the ways in which data infrastructures are defined by and implicate particular spatialities (as well as temporalities), which Straube approaches through the introduction of the concept of "topology," or hierarchical relationships between layered "stacks" in the infrastructure. This captures the ways in which protocols are layered over top of each other in the stack, for example, such that rendering a web page (retrieving and reifying data) is made possible by vertically translating between complementary, hierarchically linked (and in the case of internet protocols, independent) components of software in particular sequence or order.

Big Data infrastructures enact their own spatialities, but they are simultaneously inflected by the geographical specificities of the sociocultural contexts of their production. In his contribution, Cockayne examines the ways in which the valuing of social media data is informed by the spatial exceptionalism of California's Silicon Valley/Bay Area startup culture, in which early stage technology firms (startups) compete social capital (users, adoption) as a basis for securing economic capital in an attention economy. He argues that in addition to functioning as systems for accumulation (venture investment, profit), social media platforms and attendant data productions simultaneously function as systems for securing, appropriating, and circulating user attention: adoption of platforms, generation of "likes," retweets, Instagram comments. This affective value is closely related to economic value, wherein

monetization of platforms through advertising/promotion or monetary windfalls to startup founders through buyouts/acquisitions is dependent on active and numerous membership and user base.

Emphasizing economic value over affective value, Alvarez León examines the ways in which spatial Big Data—or geoinformation—is being progressively intimately incorporated into the digital economy through the rubric of "property regimes," which he uses to describe the ways in which actors are working to stake ownership claims over spatial content as a means of extracting value (profit) from these data productions. Using the example of Google Street View, Alvarez Leon demonstrates the ways in which the integration of Street View imagery and perspectivalism into the broader Google search product through the transfer and appropriation of rights to and from users (use of API keys; capture of their presence on the street) constitutes perhaps the "most thorough and expansive commodification of geographic information ever attempted." The exchange of personal data (capture of one's presence on the street in Street View imagery) for the utility value of the interface (fine resolution spatial data at the level of the street; precise navigational functionality) implicates precisely the twin anxieties of spatial data (insufficient; overly sufficient) described above.

Conclusion

Here, we have advanced an engagement with spatial Big Data beyond the geotag *and* beyond content productions sourced from social media platforms by bringing together a series of interventions that take up and interpret the "spatial" in spatial Big Data in variegated and nuanced ways, approaching phenomena of spatial Big Data and their everydayness via different epistemological and methodological approaches. As a quotidian, pervasive presence in the spaces and practices of everyday life, Big Data is both located, and something that locates. Infrastructures, for instance, extend their own spatialities (as well as temporalities; Straube). The commodification of geographic information is both a response to and simultaneously fuels neoliberal political economic imperatives and the anxieties of monetizing and generating profit from networked platforms and services.

The everyday experience of data is increasingly one of being located in space; or at times, it is one of conspicuously *not* being located and of experiencing and contending with the anxieties of the failure of the incompleteness of Big Data that arise in instances where one cannot be placed (or actively place oneself) in space (Wilmott). Data is inflected by and bears the traces of the geographical specificities and neoliberal

effects of the sites of their production, in ways that implicate new modes of governing subjects, and the modes by which subjects govern themselves (Cockayne, 2016). In other words, these very Big Data productions are intimately bound up with subjectivity and subject formation (Thatcher) and the twinned anxieties of spatial Big Data (not enough, and too much data; individuated subjectivities which engender new modes of data-driven governance, but not too much governance).

Note

1. Hill AX (2015) In defense of burger cartography; or, time to fall in love with maps all over again. *Medium*, 28 March. Available at: http://andrewxhill.com/blog/2015/03/28/in-defense-of-burger-cartography/ (accessed 20 April 2016).

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