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## Deep Mapping and the Spatial Humanities

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In 2012, the Virtual Center for Spatial Humanities (VCSH) held an advanced institute in Indianapolis, Indiana, on spatial narratives and deep maps. Sponsored by a major grant from the National Endowment for the Humanities, a U.S. government agency that funds humanities research, the institute invited twelve scholars—seven from the U.S. and five from Europe—whose work at the intersection of digital technologies and their disciplinary domains (history, religious studies, literary studies, geography and geographic information science, archaeology, and museum studies) promised to advance an institute aim of re-envisioning the theories and technologies of spatialization to serve the needs of humanities research more completely.

Rather than asking humanists to adopt unabridged geo-spatial technologies, such as GIS, that are based on positivist epistemologies often ill-suited to the humanities, the institute focused on a range of available geospatial technologies including GIS, geo-visualization, the geospatial semantic web, wiki-maps and mash-ups, social media and mapping systems, spatialized tag clouds, and self-organizing maps. Powerful as maps are, the institutes proposed to link and deepen scholarly understanding of complex humanities data and geospatial technologies through a focus on two innovative forms—spatial narratives and deep maps—that bend spatial and other digital technologies to the intellectual traditions of humanists, thereby constituting a bridge between diverse avenues of investigation. In doing so, it addressed two goals of the NEH call for proposals, namely, to bring together humanists and technologists to advance an innovative approach to the digital humanities and to assess the tools and methods available to support it.

Developments in Geographic Information Systems (GIS) over the past few decades have been nothing short of remarkable. So revolutionary have these advances been that the impact of GIS on many facets of government administration, industrial infrastructure, commerce, and academia has been likened to the discoveries brought about by the microscope, the telescope, and the printing press. But the dialogue between geographic information science (GISci) and the humanities has thus far been limited and largely revolves around the use of 'off-the-shelf' GIS in historical mapping projects. This limited engagement is in stark contrast to the substantive inroads that GIS/GISci has made in the sciences and social sciences, as captured by the growing and valuable field of a social-theoretically informed Critical GIS. Not surprisingly, the humanities present additional significant challenges to GISci because of the complexities involved in meshing a positivist science with humanist traditions and predominantly literary

and spatial methods. And yet it is the potential dialogue and engagement between the humanities and GISci that promises reciprocal advances in both fields as spatial science shapes humanist thought and is in turn reshaped by the multifaceted needs and approaches represented by humanist traditions. We use the term *spatial humanities* to capture this potentially rich interplay between Critical GIS, spatial science, spatial systems, and the panoply of highly nuanced humanist traditions.

The use of GIS in the humanities is not new. The National Endowment for the Humanities has funded a number of projects to explore how geospatial technologies might enhance research in a number of humanities disciplines, including but not limited to history, literary studies, and cultural studies. The National Science Foundation and National Institutes of Health also have supported projects related to spatial history, such as the Holocaust Historical GIS (NSF) and Population and Environment in the U.S. Great Plains (National Institute of Child Health and Human Development). In Europe the list of projects is equally impressive, with studies of nineteenth-century railroad development and urbanization, a spatial analysis of child mortality in industrializing Great Britain, and a detailed geography of the Irish famine among the more noteworthy accomplishments.

Although successful by their own terms, these projects have revealed the limits of the technology for a wider range of humanities scholarship, which an increasing body of literature discusses in detail. Chief among the issues are a mismatch between the positivist epistemology of GIS, with its demand for precise, measurable data, and the reflexive and recursive approaches favored by humanists and some social scientists (e.g. practitioners of reflexive sociology) who wrestle continually with ambiguous, uncertain, and imprecise evidence and who seek multivalent answers to their questions. The problem, it seems, is both foundational and technological: we do not yet have a well-articulated theory for the spatial humanities, nor do we have the tools sufficient to meet the needs of humanists.

Addressing these deficits is at the heart of much current work in the spatial humanities, with the focus on four interrelated areas research and development. First, researchers are exploring the epistemological frameworks of the humanities and GISci for the purpose of locating common ground on which the two can cooperate. This step is invariably been overlooked in the rush to apply the new technology but it is the essential point of departure for any effort to bridge them. This venture is not to be confused with a more sweeping foundational analysis of ingrained methodological conceits within the sciences and the humanities, and certainly should not be misunderstood as a query about the qualitative approach versus the quantitative approach. Rather, what is desired here is to expose humanities scholars to the breadth of

geospatial technologies and subsequently for the technology itself to be interrogated as to its adaptability. This approach is in full understanding that the technology has, in its genesis, been epistemologically branded and yet still offers potential for the humanities. GIS, for all of its demonstration of confidence in Euclidean space, quantification, disambiguation, and reduction, has proven its capability to represent uncertainty and variability in the visualization of geospatial data. In weather forecasting and ocean modeling, for example, uncertainty can be encoded with the data and visualizations fashioned that are multivariate and multidimensional. The technology, then, is more supple than its critics suggest. What is required is an appropriate intellectual grounding and arena in the humanities that will enable skilled humanities scholars to draw the technology further out of its positivistic homeland.

In a similar way, the development of spatial humanities requires both an understanding of the ontology and epistemology of GIS and a closer collaboration with its GIScience practitioners. The challenge is how to realize the promise of hybridity between humanistic critical discourses and the theoretical perspectives of Critical GIS. Humanists can give more thoughtful consideration to location and spatial relationality, and can take leads from visualizations of data such as self-organizing maps and Virtual GIS, which can capture complex data at the same time that they indicate relativity and ambiguity. The payoff for collaboration will be a humanities scholarship that integrates insights gleaned from spatial information science and spatial theory into scaled narratives about human lives and culture. Such rewards are glimpsed, for example, in Mei-Po Kwan's and Guoxiang Ding's analysis of "geo-narratives," assembled from oral history sources and a blend of other qualitative and quantitative data as a way to understand the lives of Muslim women in Columbus, Ohio after 9/11.<sup>2</sup>

Humanities scholars work largely with texts, and the majority of those texts take the form of language, alongside material artifacts, behavioral enactments, art, and the like. A key part of the challenge of thinking spatially and leveraging spatial technology is to design and frame narratives about individual and collective human experience that are spatially contextualized. At one level, the task is defined as the development of reciprocal transformations from text to map and map to text. More importantly, the humanities and social sciences must position themselves to exploit the Geospatial Semantic Web, which in its extraordinarily complexity and massive volume, offers a rich data bed and functional platform to researchers to effectively mine it, organize the harvested data, and contextualize it within the spaces of culture. The agenda here is to advance textual analysis that understands the bi-locality of text in both metaphorical space and geographic space. Humanities scholars can benefit by

learning to extract spatial relationships embedded in text and devise narrative forms that join spatial story-telling to more traditional humanities semantics. Here, the payoff is potentially rich; a significant extension of work already underway in literary and cultural studies (e.g. narrative topographies, the spatial *imaginaire*, and novel mappings). Not only is the vast bulk of human experience recorded as text rather than in quantitative form, words are the preferred medium of both ordinary and scholarly communication, regardless of topic or field. Finding ways to make the interaction among words, location, and quantitative data more dynamic and intuitive will yield rich insights into complex socio-cultural, political, and economic problems, with enormous potential for areas far outside the traditional orbits of humanities research. In short, we should vigorously explore the means by which to advance translation from textual to visual communication, making the most of visual media and learning to create “fits” between the messages of text and numbers and the capabilities of visual forms to express spatial relationships.

An emphasis on absolute space based on Euclidean coordinate systems often frustrates the humanist’s effort to understand how spaces change over time, and how spatial relativities emerge and develop. There is an urgent need for the development, within GIS specifically and spatial technologies more generally, of spatio-temporal tools that will enable humanities scholars, social scientists, geographers, and others to incorporate time into analyses that are spatially contextualized. The increasing utilization of GIS by historians suggests that the historical interests in cause and effect, the development and alteration of networks, and the temporal patterning of events is served at least to some extent by current technologies. Such historical studies, however, strain to translate a technology that treats time as categorical and discontinuous into a tool that can represent the richly contingent flow of culture, opting by default for a model that strings together spatio-temporal snapshots on the way to a story-as-collage. The importance of narrative within the humanities can stimulate the development of better spatial tools that incorporate time as well, just as spatial thinking and tools can encourage richer considerations of spatial relationships in narrative time.

Central to the emergence of the spatial humanities is a trust that the contingent, unpredictable, and ironic in history and culture can be embodied within a narrative context that incorporates space alongside of time. For the humanities—and for social scientists who are influenced by the humanities—it is above all the thick weave of events, locations, behaviors, and motivations that make human experience of space into place. Place is the product of “deep contingency” and of the human effort to render that experience meaningful in language, art, ritual, and in other ways. Place is constructed out of the imagination as much as through what is visible and tangible in experience. Humanists, social

scientists, and geographers, and all who are interested in seeing a spatial humanities mature, should plan for a future state of affairs that will extend the frontiers of “deep mapping.” That is, we should build increasingly more complex maps (using the term broadly) of the personalities, emotions, values, and poetics, the visible and invisible aspects of a place. The spatial considerations remain the same, which is to say that geographic location, boundary, and landscape remain crucial, whether we are investigating a continental landmass or a lecture hall. What is added by these “deep maps” is a reflexivity that acknowledges how engaged human agents build spatially framed identities and aspirations out of imagination and memory and how the multiple perspectives constitute a spatial narrative that complements the verbal narrative traditionally employed by humanists.

Here is where the deep map becomes important. An avant-garde technique first urged by the Situationists International in 1950s France, the approach “attempts to record and represent the grain and patina of place through juxtapositions and interpenetrations of the historical and the contemporary, the political and the poetic, the discursive and the sensual...”<sup>3</sup> Its best form results in a subtle and multilayered view of a small area of the earth. As a new creative space, deep maps have several qualities well-suited to a fresh conceptualization of GIS and other spatial technologies as they are applied to the humanities. They are meant to be visual, time-based, and structurally open. They are genuinely multi-media and multilayered. They do not seek authority or objectivity, but involve negotiation between insiders and outsiders, experts and contributors, over what is represented and how. Framed as a conversation and not a statement, deep maps are inherently unstable, continually unfolding and changing in response to new data, new perspectives, and new insights.

The analogue between a deep map and advanced spatial technologies seems evident. Geographic information systems operate as a series of layers, each representing a different theme and tied to a specific location on planet earth. These layers are transparent, although the user can make any layer or combination of layers opaque while leaving others visible. A deep map of heritage and culture, centered on memory and place, ideally would work in a similar fashion. The layers of a deep map need not be restricted to a known or discoverable documentary record but could be opened, wiki-like, to anyone with a memory or artifact to contribute. However structured, these layers would operate as do other layers within a GIS, viewed individually or collectively as a whole or within groups, but all tied to time and space that provide perspectives on the places that interest us. It is an open, visual, and experiential space, immersing users in a virtual world in which uncertainty, ambiguity, and contingency are

ever-present but all are capable of being braided into a narrative that reveals the ways in which space and time influences and is influenced by social interaction. In narrative theory, this space is one in which both horizontal and vertical movement is possible, with the horizontal providing the linear progression we associate with rational argument and vertical movement providing the depth, texture, tension, and resonance of experience.

The coalescence of digital technologies over the past decade, especially seen in the toolkit of Web 2.0, makes it possible to envision how geospatial technologies might contribute to the formation of a deep map, just as the various theories about spatial narratives offer guidance on the structure they may take. However, work in both areas is still too scattered and too abstract to be useful to humanists. And it is here that the institute sought to make its greatest contribution: it worked collaboratively across disciplines and with experts in technology to develop structured approaches to deep mapping and spatial narratives that in turn could be tested as prototypes, with the aim of developing a robust platform in subsequent grants

Divided into three teams, the participants developed three approaches to a deep map, using spatially enabled data provided by the institute directors. The data include: (1) the rich set of religious adherence and demographic data for each of the nation's 3,000+ counties, included in the Digital Atlas of American Religion, a web-based GIS ([www.religionatlas.org](http://www.religionatlas.org)); (2) a large archive of digital, spatially referenced ethnographic, image, interview, and video data from the six-year Project on Religion and Urban Culture conducted by the Polis Center from 1996-2002 that examined the intersections between religion and community in 20<sup>th</sup>-century Indianapolis; (3) the SAVI Community Information System for Central Indiana, an interactive web-based GIS community information system developed by the Polis Center that contains an enormous amount of data on over 2,000 geographical units in the eleven-county Indianapolis MSA from 1990 to the present; and (4) the digital newspaper and print, image, and audio archives of the Indiana Historical Society and Indiana State Library. The problem supported by the data focused on an important issue in modern American history and culture, namely, social fragmentation and spatial change as evidenced in American religion at national, state, local, and neighborhood levels.

The essays that follow are reports of work-in-progress. We offer them because they represent different ways to think about the challenges and potential of deep mapping, but their importance is much larger than the schema presented here. They are in fact among the first efforts to make the attempt to move toward a more integrated, less GIS-dependent

spatial framework for humanities research. As such, they are prototypes from which we can learn as we seek to learn what works in this new and exciting field.