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SCHOLARLY COMMUNICATION INSTITUTE 7: Spatial Technologies and the Humanities

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Introduction and Meeting Summary

With funding from The Andrew W. Mellon Foundation, the Scholarly Communication Institute (SCI) began in 2003 to provide an opportunity for scholars and leaders in scholarly disciplines and societies, academic librarians, information technologists, and higher education administrators to design, test, and implement strategies that advance the humanities through innovative information technologies. The Institute convenes each summer at the University of Virginia Library.

Scholarly Communication Institutes 1-4 focused on the promotion of digital scholarship and its supporting infrastructure in digital humanities (SCI 1 and 3); and in selected academic disciplines (Practical Ethics in SCI 2 and Architectural History in SCI 4). SCI 5 took a broad look at visual studies; and SCI 6 focused on humanities centers as sites of innovation, collaboration, and interdisciplinary exploration. (For more background on the Scholarly Communication Institute, see http://uvasci.org/.)

SCI 7, the subject of this report, focused on *spatial technologies and methodologies*—the specific modes of working they favor, the scholarly practices they enhance, and the infrastructure they demand to achieve scale and significance.

Why spatial technologies?

The humanities address dimensions of space and time—natural, social, and imaginary. An array of geospatial and mapping technologies that analyze and represent space and spatial relations are in widespread use today. They are the impetus behind what many are calling a "spatial turn." Scholars and students alike carry "location-aware" personal computing devices embedded with GPS technology. They use vernacular applications such as two- and three-dimensional Web mapping services in the classroom and sophisticated Geospatial Information Systems (GIS) software in long-term research collaborations. The ubiquity of spatial technology presents unique opportunities to humanities scholarship, but at the same time, it challenges long-standing scholarly practices. Therefore, it was important at SCI to take account of the

epistemological and methodological foundations of spatial reasoning as well as the technical complexities of using and managing spatial data and tools.

The goals of the meeting were to:

- better understand the significance of the spatial turn for the production and dissemination of knowledge;
- indentify the needs of infrastructure that can support spatial scholarship;
- evaluate the barriers to validating, credentialing, and publishing spatial scholarship;
- propose actions that will further the adoption of spatial scholarship and identify the actors best positioned to move that agenda forward.

We invited participants from geography, history, archaeology, and architectural history who are using advanced technologies to investigate social and physical spatial systems, with particular interest in how humans have interacted with and modified their physical environments. We also invited scholars studying cultural and imaginative constructions of space and time, along with computer scientists, librarians, publishers, university administrators, and funders. As a rule, scholars across all disciplines shared an interest in the nature of change over time and how to represent that change. But there were also strong differences in peoples' assessments of the value of existing tools for research and representation, as well as how to develop tools that are easy to use and still rigorous, precise, and able to support scholarship for decades, not just until the next software release.

Conversation at SCI 7 focused on three areas: knowledge production, technical infrastructure, and organizational infrastructure.

Knowledge production

Our attention to the "spatial" encompassed both space and time. Representation of spatial phenomena, especially from the past, is often done by making a map, a two- or three-dimensional model, or a visualization. These are not "illustrations" of ideas: creating a spatial representation is the process by which discoveries are made, through iteration and learning. The spatial element of both social and physical systems is so vital to the human experience that spatial technologies have powerful uses in nearly all disciplines. This accounts for the rich variety of organizational models for deploying spatial technologies across numerous campuses; there is no one solution to the provision of spatial technology services, because the use of these tools is so deeply inflected by domain-specific methods.

Geographers, whose own field was disrupted by the emergence of GIS in the 1960s, shared their perspective on spatial reasoning and representations. Joined by archaeologists and architectural historians whose research and discovery methods are based on gathering data and building models, maps, and spatializations, they argued that we need to develop skills that allow us to read deeply in maps and visualizations. We need to think about space as more than

a metaphor, and maps as more than illustrations; they have become platforms for data integration, discovery, analysis, and representation.

Technical infrastructure

SCI 7 participants across the board urged the development of tools and technologies to deal with ambiguity and uncertainty, changing toponyms, qualitative attributes, and representation of agency and subjectivity. Scholars need to work with technologists to develop better representational schemes for imaginary and sacred as well as non-Western secular spatial and calendrical systems. They want to be able to incorporate sensory data such as audio in models and spatializations. There also needs to be a continuum of tools at hand, from the simple yet powerful commercial Web applications that serve as a gateway for students and scholars to experience spatial modeling and mapmaking, to more robust systems with high functionalities that, in most cases, offer greater promise of persistence and reliability. In addition, to be useful to students and scholars at different junctures of their careers, there should be a portfolio of tools that can produce results within a few months, in a year, and over the course of long-term research projects.

Organizational infrastructure:
To nurture these new practices, universities and professional societies need to encourage and reward the collaborative working structures that spatial technologies demand. Campuses should provide working spaces amenable to collaborative discovery, such as laboratories and design studios. Scholars, professional societies, and campus leaders need to work out methods for appropriate crediting of individual contributions to collaborative work, ethical standards for handling sensitive data, and reward for good scholarship. In particular, professional societies should model and endorse appropriate protocols for validating and credentialing spatially-enabled scholarship. This means that senior scholars, who commonly play crucial roles in evaluation of new work, should be equipped to review scholarship that uses spatial arguments and presents those arguments through visualizations and maps. Leaders of professional societies and recognized scholars are critical to ensuring this work receives proper acknowledgement. This is necessary if they are to continue attracting and retaining creative and innovative scholars in their fields.

NEXT STEPS

Among the concrete actions that *professional societies and humanities centers* can take are the development of workshops. Societies and centers could provide a venue for:

- workshops that expose scholars at all stages of their career to spatially-enabled scholarship;
- workshops that impart technical and spatial reasoning skills;
- workshops that convene scholars to present and discuss case studies of high-impact spatial scholarship.

University administrators and CIOs should view spatial technology as a strategic enabler of research, rather than as a utility. Given the scale and variety of geospatial applications and data, universities should develop common infrastructure for collaboration, interoperable repositories, and shared services. They should begin now to include planning for geospatial infrastructure to be shared across campuses. This would mean, among other things:

- promoting the development and adoption of data standards;
- building interoperable geospatial data repositories;
- providing shared geospatial Web services.

Scholars and publishers should partner on developing and testing new models of scholarly publication, including redefining what constitutes an edition of a work of scholarship, and ensuring persistent linking for online spatial content referenced in journals and monographs.

Finally, *funders* can help by supporting development activities undertaken by scholars, societies, and institutions. Through their funding guidelines, they can encourage collaboration, data sharing, use of standards, and commitments to persistence.