NATIONAL ENDOWMENT FOR THE Humanities

OFFICE OF DIGITAL HUMANITIES

Narrative Section of a Successful Application

The attached document contains the grant narrative and selected portions of a previously funded grant application. It is not intended to serve as a model, but to give you a sense of how a successful application may be crafted. Every successful application is different, and each applicant is urged to prepare a proposal that reflects its unique project and aspirations. Prospective applicants should consult the Office of Digital Humanities program application guidelines at http://www.neh.gov/grants/odh/digital-humanities-start-grants for instructions. Applicants are also strongly encouraged to consult with the NEH Office of Digital Humanities staff well before a grant deadline.

Note: The attachment only contains the grant narrative and selected portions, not the entire funded application. In addition, certain portions may have been redacted to protect the privacy interests of an individual and/or to protect confidential commercial and financial information and/or to protect copyrighted materials.

Project Title: Visualizing Flow and Movement for the Humanities

Institution: University of Redlands

Project Director: Diana Sinton

Grant Program: Digital Humanities Start-Up Grants, Level 1

Enhancing the humanities through innovation - Movement is one of the most basic and universal actions of humanity. We once moved with the seasons, following plants and game; and later, to trade goods, colonize, and conquer. With the emergence of written languages, publishing technologies, and expanded social networks, "ideas" began to move around as well. This movement or flow of entities (people, ideas, languages, cultures, etc.) forms the basis of many of our narratives and investigations in the humanities, whether we study the spread of democracy or ancient trade and pilgrimage routes. Ideas of governance, belief systems, and cultural styles flow across locations, carried by foot historically and by digital technologies today.

Visualizing flow and movement over geographic space and time, and attendant issues of uncertainty and data representation, is a topic that has garnered the attention of digital humanities scholars, emerging as a common and widespread theme.[1] At the University of Redlands (Redlands), this research area has begun to provide fertile ground for interdisciplinary inquiry and cross-campus collaboration on digital humanities:

- A religious studies professor is researching the migration and intersection of Christian and Buddhist monks along documented networks of ancient trade routes. Using digital maps to visualize the movement of individuals, texts and ideas will help her re-frame research questions and gain new insights. What discernable patterns characterize ancient religious movement and migration? Can one trace the spread of particular ideas along a given route? How do points of intersection inform understandings of the range of ideas an individual traveler may have encountered? Who might be impacted by resultant cross-pollinating effects?
- An archaeologist is studying how Native American migrations were influenced by the desire to maintain visibility with sacred peaks – and how sacred landscapes were remembered and reconfigured once movement blocked a visual connection. He has started preliminary work with programmers on a prototype digital tool that allows users to "fly" through a virtual reconstruction of this ancestral landscape to explore spatial, visual, and chronological connections between landforms and ancient villages.
- Students in a historian's class are learning how nascent styles of jazz and blues music diffused across the US in the early 20th century, in fits and starts as affected by laws of racial segregation. Students are using a web-based map service to add nuggets of research and information in certain locales. They will then set in motion the paths of jazz and blues, creating a spatio-temporal "chart" in the way jazz musicians improvise music.

These scholars are asking central questions about flow, movement, diffusion, and migration. What channels and networks are used, when and why? What factors inhibit and restrict movement, and which facilitate and encourage it? What conditions control the magnitude or intensity of movement, whether they are texts or musicians or ideologies? Through their ongoing research, these scholars have begun to acquire deep insights into this information but we have yet to fully develop satisfying ways to *visualize* this movement or flow across geographic space. If we were to simply use the flow mapping tools existing today, with basic arrows and a limited capacity to represent uncertainty of origins, destinations, and the nature of the movements themselves, the results are likely to be underwhelming, unsatisfying, and most importantly, risk yielding few new insights.

Mapping flow and movement is a recognized need within the digital humanities community. At the 2005 Digital Tools Summit hosted by the University of Virginia, humanities scholars envisioned: *"an integrated suite of software tools that go beyond classic and general-purpose Geospatial Information Systems* [GIS]. *The suite should support domain specific contexts and should use visualization to facilitate understanding, perception, and hypothesis formation. It should aid the scholar in dealing with the data, highlighting data problems, understanding of large-and small scale data features and understanding different perspectives on the data."*[2] To conceptualize such tools, we need to bring together bright and focused minds from the humanities, geography, and information technology, to address specific humanistic questions surrounding flow and movement, and to further articulate user needs and technology specifications.

[1] For example, see: http://www.iath.virginia.edu/dtsummit/SummitText.pdf; http://www.arts-humanities.net/tools; http://www.stanford.edu/group/spatialhistory/cgi-bin/site/pub.php?id=29; http://www.uvasci.org.
[2] http://www.iath.virginia.edu/dtsummit/SummitText.pdf

For this reason, Redlands is requesting Level I funding to convene an interdisciplinary specialists' workshop to identify the core questions, issues, obstacles, and opportunities about flow mapping. We need a deeper and wider understanding of how humanists and geographers alike envision flow and movement. We need to explore the types of central questions mentioned above (the nature of routes, inhibitors, facilitators, magnitude changers, etc.). We need time to imagine representing flows, their origins and their destinations; especially when these locations are indefinite or uncertain, or when flows are non-linear or have complex branching patterns that are cyclical, episodic, or circular. As participants at our workshop, humanists and geographers will meet to share, explore, and brainstorm these topics while in the company of technologists who can provide their perspectives on tools for mapping and visualization. This investment of time spent on defining and clarifying conceptual and cartographic needs has been largely missing to date, and without this, we may continue to find the use of existing tools limited and unsatisfying. We will produce a report that describes the key issues and technology needs, and presents a conceptual design for a digital tool. We intend to apply for a Level II NEH grant to develop this technology for use in humanities research and teaching.

Environmental scan - Durable and easily usable tools for visualizing flow and movement across geography are uncommon. Most digital flow maps rely on Flash, Java, or other web programming technology.[3] While visually appealing, they require advanced skills and additional programming as well as an expensive commitment to maintain. And while social network mapping has received significant attention lately, and many digital endeavors have been launched, mapping connections in traditional geographic space is still a priority. Moreover, these dynamic animations have not dealt with some of the most interesting issues that humanists face when mapping in geographic space. Static maps can depict the different locations of people at Time 1, 2, and 3, but the nature and details of the movement itself are left to the imagination of the viewer. GIS-based maps with arrows imposed can indicate directionality of movement from one polygon to another,[4] or from one precise point to a second precise point,[5] while varying widths of arrows can suggest the volume or magnitude of the flow. But geospatial tools represent locations as exact and unambiguous; how do we deal with the uncertainty inherent in much historical and cultural information?

Automated solutions for visualizing flow and movement have been designed in the past. In the 1980s, geographer Waldo Tobler first released Flow Mapper, since updated for use with ArcGIS software.[6] A group of Dutch geographers also has developed a flow mapping tool.[7] These are designed to generate basic point-to-point representations, yet scant attention has been paid to how points are located or are represented, and the cartographic options for symbolizing flow arrows are absent or limited. Computer scientists at Stanford University have identified issues that make a "good" flow map in their opinion, including the ability to adjust or distort the representation of flow around features in the map, such as the shapes of countries, to optimize map readability.[8] They also combine or merge arrows coming from a single origin point to many destination points, and cluster lines cartographically, visually reducing clutter in the map. This attention to cartographic details begins to address important issues, but using the raw code itself (available for download) would be unrealistic by most humanities scholars. These tools are not easily used by the novice map maker or scholars largely unfamiliar with mapping applications.

History and duration of the project - The proposed workshop is an outcome of a campus-wide initiative to infuse maps, mapping and spatial perspectives into curriculum, research and operations at Redlands, where spatial thinking and GIS are an explicit focus of the current Strategic Plan. Since 1997, Redlands has invested well over $700,000 in new programs, computing infrastructure, and faculty and staff positions. Redlands hired a Director of Spatial Curriculum and Research and launched a new program called LENS: LEarNing Spatially.[9] Pioneering courses

[3] http://www.bbc.co.uk/scotland/education/geog/population/migration_map.shtml; and http://pewsocialtrends.org/maps/migration/
[4] http://www.forbes.com/2010/06/04/migration-moving-wealthy-interactive-counties-map.html
[5] http://republicofletters.stanford.edu/
[6] http://www.csiss.org/clearinghouse/FlowMapper/; and http://www.alanglennon.com/flowtools/fdmthelp.htm
[7] http://flowmap.geog.uu.nl/
[8] http://graphics.stanford.edu/papers/flow_map_layout/
[9] http://lens.redlands.edu

and research projects have been developed in conjunction with faculty from archaeology, biology, business, economics, education, environmental studies, government, history, music, race & ethnic studies, religious studies and sociology. Each of these efforts focuses on the *where* within each respective discipline, to gain new insights into *why*, *how*, and *when*. More than 40 people directly support this effort in the College of Arts and Sciences, graduate schools of Business and Education, the research-focused Redlands Institute, a graduate program in GIS, and the Library and Academic Computing. In 2009, Redlands received a 3-year grant from the W.M. Keck Foundation to support LENS, and focused its first year on a Mapping People theme.[10] During the 2010 LENS Summer Institute, participants confirmed that generating movement and flow visualizations are an ongoing interest and need.

Work plan (April 2011 – March 2012) - We request a 1-year grant to host a 4-day workshop in August 2011. NEH funding will support participant stipends and travel, as well as support staff. Participants will include 20 humanities faculty, computer programmers, and geographers, including Redlands faculty, in a format similar to *THATCamps*, with structured and open-ended discussion and technology mini-design sessions.

- *Task 1: Workshop Preparation* (April – July 2011) will include: (a) refining the list of participants, sending event notices and invitations, and workshop logistics; (b) creating a "wiki-space"/website for preparatory materials and discussions; and (c) gathering readings, tool examples and other materials for the website, designed to facilitate ongoing collaboration, and further tool development.
- *Task 2: Workshop Delivery* (August 2011). The 4-day workshop will be held in a lab and breakout rooms in our Library/Computing Center and supported by campus technology and event staff. We will cycle through group discussion, mini-presentations and tool critiques, and breakout sessions to articulate key issues, discuss limitations and possibilities for technology solutions, and create a first-cut needs assessment and conceptual design for a visualization tool for flow/movement. Participants will complete a narrative evaluation of the workshop experience and proposed tool.
- *Task 3: Workshop Synthesis* (August 2011 – March 2012) will involve: (a) summarizing and synthesizing workshop discussion into a white paper/report and tool concept design document; (b) sharing workshop findings at professional conferences (see below); and (c) writing and submitting a journal article.

Staff - Project Director Diana Stuart Sinton PhD is Director of Spatial Curriculum and Research at Redlands and director of the LENS initiative. Diana brings 13 years of experience working at the interface of geography, GIS/spatial thinking and higher education. Diana will oversee project management, lead the design, facilitation, and synthesis of the specialist workshop and develop the Level II grant proposal (5% of time during the grant). Project advisor Alan Glennon is a PhD Candidate at the University of California-Santa Barbara, whose research focuses on flow/movement tools in GIS. Alan will assist Diana in tool review, and in workshop design and facilitation (5% of time during grant). GIS Specialist David Smith will join Redlands Institute Technology Manager Nathan Strout and Analyst Programmer Stephen Daugherty to assist Diana and Alan with technology review, workshop tech support, and tool design; Designer Lindsey Devlin will develop the website. Other University staff will support grant management and event logistics.

Final product and dissemination - The proposed workshop will result in a white paper and report summarizing the intellectual, pedagogic, and technological context for developing a digital humanities tool to visualize flow and movement. This report along with workshop materials will be available through the workshop website/wiki-space. Participants from the workshop will be invited to collaborate on a journal article describing our conclusions. We will apply what we have learned immediately with our own faculty, and share with other scholars at both the Digital Humanities and Association of American Geographers conferences. In addition to pursuing a Level II NEH grant, we will pursue funding under the LENS initiative and support the ultimate release of the envisioned digital tool on the web. Redlands is committed to fostering a spatially-infused learning community, to building a solid portfolio of research and teaching around spatial thinking and GIS, and to providing financial and technical support to ensure the long-term sustainability of these efforts.

[10] http://www.spatial.redlands.edu/lens/summerinstitute/