TOWARDS GEOSPATIAL HUMANITIES: REFLECTIONS FROM TWO PANELS

CLIO ANDRIS, EDWARD AYERS, KARL GROSSNER, YINGJIE HU, KATHY HART, JAMES THATCHER, AND ROBERT T. TALLY JR. WITH ALBERTO GIORDANO

INTRODUCTION

As part of the 2019 UCGIS Symposium, we organized two 75-minute panels held on Tuesday, June 11, and Wednesday, June 13, 2019. The objective was to bring together researchers from the geosciences and the humanities to debate how to conduct transdisciplinary research, how to make progress towards the geospatial humanities, and to think about a curriculum for the geospatial humanities. Broadly categorized, Tuesday's panel included scholars with a geography and GIScience background working and reflecting on how these disciplines and fields may contribute to humanities research. Wednesday's panel was organized with the opposite perspective in mind and included researchers from the humanities who engage with geography and GIScience in their scholarship and profession. In addition to representing different disciplines, the panelists are at different stages in their academic or professional career: some have engaged with the spatial humanities, the geohumanities, and more broadly the digital humanities for decades – in fact, they are pioneers in the field – while others have only recently become interested in doing research in these fields. We did this intentionally, as we hoped that different perspectives and expertise would provide a range of experiences, opinions, and expectations of special interest to the multidisciplinary readership of the IJHAC.

Prior to the symposium, we sent three questions to the panelists. The questions were intended to get the conversation started at the event, provide a common thread to guide the discussion across the seven presentations and the two panels,

International Journal of Humanities and Arts Computing 14.1-2 (2020): 6–26
DOI: 10.3366/ijhac.2020.0242

www.euppublishing.com/ijhac

and as a common core for this published contribution. Both at the symposium and in their written statements, the panelists chose to tackle all three questions or only one or two, and elected to answer the questions in the order provided or merged into a narrative. The three questions were as follows:

Question 1: *Research collaborations between GIScientists and humanities scholars have multiplied in the past several years, but collaborations often require taking down disciplinary walls, the embrace of different methods and theories, an openness to reevaluate long-held convictions, and a deeply personal willingness to learn from practitioners of other disciplines. In your experience, what will it take for this collaboration to be a truly transdisciplinary research effort? What would the benefits be of such collaborations, to the humanities and to GIScience?*

Question 2: *The spatial humanities and the geohumanities are both part of the digital humanities and are different manifestations of the so-called spatial turn in the humanities. While the former can be broadly characterized as quantitative in methodology and based on abstract notions of space, the latter tends to be qualitative and rooted in theories of place. While a convergence is slowly forming between the geohumanities and the geospatial humanities—hence the title of this symposium, the "geospatial humanities"—with mixed methods analysis and a movement towards a "GIS of place," a tension that is often ideological and epistemological still exists between the two camps. At times, geographers and GIScientists favoring one or the other approach are more likely to collaborate with researchers in the humanities than with each other. Do you agree with this characterization and, if so, what steps could be taken to facilitate a move towards the geospatial humanities? Most importantly, what would be gained by this collaboration, what would it be based on, and how would it benefit the humanities, geography, and GIScience?*

Question 3: *The university educational model still tends to privilege specialization and separation between fields. In contrast, becoming an academic researcher in the geospatial humanities or a practitioner of the field of the digital humanities in general, requires interdisciplinary skills. What would a curriculum in the geospatial humanities look like at the undergraduate and graduate level? How do we teach how to conduct interdisciplinary, multidisciplinary, and transdisciplinary forms of collaboration? Related to this issue, and specifically as concerns the academic field, do you agree that interdisciplinary research can still be risky for a successful career in academia?*

Panel on Tuesday, June 11, 2019:
INTEGRATING SPACE AND PLACE IN GISCIENCE: EXAMPLES, CHALLENGES, AND OPPORTUNITIES
Participants: Clio Andris, Pennsylvania State University; Karl Grossner, University of Pittsburgh; Yingjie Hu, University at Buffalo; James Thatcher, University of Washington, Tacoma.

Answers by Clio Andris:

Using scientific methods and computing technologies to examining humanities phenomena has yielded new findings about society and its artefacts. The digital humanities have led the field in using technology, data mining and AI to answer vital questions about law, art, film, music, religion and literature. As a result, we can extract basic statistics from large cultural corpora, such as the determination of three critical turning points in pop music from a database of a million songs (Mauch et al. 2015). We can use chemical analysis to examine textile dyes' geographical route, and decompose paint's organic compounds to detect art forgeries (Brereton, 2013). Even personal relationships are being examined analytically: models of chaos theory, Lorenz attractors, and tipping points are now used to show common pathways of success and trouble in marriage (Gottman et al. 2005). This movement toward measuring things that may seem unmeasurable (the works of Shakespeare, Renaissance Art, etc.) does not claim to supplant the work of scholars who provide more nuanced observations, but adds another perspective to the humanities.

The geospatial humanities is a unique branch of research that adds a spatial component to the pursuit of elucidated storytelling and the unveiling of societal processes. GIS researchers who engage with humanities questions have done more than research the *what* and *where* of GIS – which are perhaps the most explicit and straightforward tasks – but have tackled the more difficult questions of *how* and *why* – as well as *so what*? These deeper questions are evident in historical GIS and platial GIS initiatives (Elwood, Goodchild, and Sui, 2013; Giordano and Cole, 2018) that stretch the limits of what GIS was originally created to do. Successful geospatial humanities approaches seem to exhibit two major qualities. First, GIS analysts appear to carefully choose geospatial methods that best complement and capture the data and deep backstory behind the stories, and foregoing the latest (and trendy) tools in order to do so. Second, these works seem to be the result of iterative communication between co-authors: from the constant refining of research questions and methods between humanities domain experts and GIS methodologists (as the pathway is not always clear from the start!) to decisions to omit hard-earned results if they do not quite fit into the overall narrative. It takes sincere creativity to avoid running every tool in the kit in search for statistical significance, and discipline to leave some results on the cutting room floor.

The GIS community can further support these endeavors in many ways, and is well-situated to do so. The community can continue to appreciate applied work – by publishing it, calling for it, and using it in the classroom. I often see and review (and write) papers on urban mobility (taxi, Uber, etc.), GPS traces, check-ins, tweets in GIS, where there is no theory to test, and no hypotheses. It is as if the data's location is arbitrary and ignored, which is not only shortsighted, but is outside the foundations of our discipline. Although big data wrangling is commendable and impressive – and gives us new ways of measuring the world – the lack of theory can be an unfortunate oversight. At best, articles cursorily mention Jane Jacobs, Jan Gehl, or Kevin Lynch at the beginning, and conclude with an empty promise that their analysis will be helpful for policy makers, geographers, and urban planners. To continue to steer our community in the right direction, peer-reviewed journals and conference editors can parlay serious requirements for their manuscripts. First, we suggest that papers have hypotheses about their study area and is relation to the phenomena at hand. The case *against* the hypothesis is strong in bid data (Good 1983; Steadman 2013): we want to avoid personal "bias", we are interested only in the tool and how it works, programming puzzles feel like more of an accomplishment to solve, or that a case study makes the tool seem un-generalizable. But the hypothesis serves as evidence of ownership over the phenomena being studied. The geospatial humanities community has successfully examined the spatio-temporal properties of a dataset with equal rigor, but adding deep interpretation or context. These researchers elect not to write discussion sections that simply, and vaguely, allude to analysis being helpful for urban planners and policy makers, but to give a clear recommendation of exactly *how* their research can be used and what its implications are. This approach allows the results to speak across disciplines.

The geospatial humanities are also, by nature, interdisciplinary. Successful studies require a commitment to reading articles – memos, reports, archival sources, legal documents, etc. – that do not pertain to their method, but to understanding why people do what they do. These papers are the antithesis to computer code and programming documentation, as they leave much up for interpretation. Our technical papers should also include ethnography and deeper implications of technology use. One helpful example is a 2011 ACM conference paper entitled 'Performing a check-in: emerging practices, norms and "conflicts" in location-sharing using Foursquare' (Cramer, Rost, and Holmquist, 2011), because it tells us what it means to perform a check in, why people do it, why do they not. Such efforts allow us to seamlessly bridge human behavior research with data mining.

Success in the geospatial humanities may also require patience. In a system that increasingly privileges rapid productivity, it takes longer to produce interdisciplinary work, because a gold-standard paper likely plays a dual-role in innovating GIS methods and contributing to the understanding of humanities.

Good collaborations invite co-authors from industry, fine arts, performing arts, NGOs, historical societies, civic groups, grassroots organization, media and more, who provide a treasure trove of wisdom on the 'why' of human behavior. Working with coauthors outside academia requires building their trust, and making the collaboration fruitful for their professional or personal goals, as well as merging schedules. Interdisciplinary work can also face hurdles in the grant-garnering (and publication) process, as proposals receive twice the number of reviewers, which can invite poignant scrutiny, and so, high-risk research seems difficult for large funding agencies to prioritize.

Still, the outcome is worth these risks. There is no evidence, to my knowledge, that innovation in machine learning, data mining and big data analytics is weakened by partnering with non-technical domain specialists to interpret data results. (Quizzically, partnerships outside of computation and statistics specializations are often seen as threats to methodological advances.) Yet, these partnerships are mutually beneficial, as humanities researchers learn new 'rules' about a familiar system, and GIS analysts have data that can be interpreted at a more meaningful level, as well as new proof that GIS tools are adaptable and that they work. In addition, the humanities researcher provides depth (quotations, multimedia, personal experiences) to large flat files, while the spatial analyst describes how generalizable single case studies might be – adding more power to small samples. This mutual appreciation cultivates a deep respect for researchers whose approach to knowledge discovery is quite different than one's own and makes geographic space an important part of the human experience.

Answers by Karl Grossner:

What's in a Name?

Encouraging connections between GIScience and the digital humanities was a prime motivation for the creation of the GeoHumanities SIG of the Association of Digital Humanities Organizations (ADHO), which I co-founded with Kathy Hart in 2012. The group had some success heightening awareness of geospatial methodologies and bringing people with similar interests together for workshops and networking gatherings. At the large DH conference in Utrecht in July 2019, the SIG hosted a well-attended half-day 'conversations workshop.' The group's name was chosen over 'Spatial Humanities' very deliberately. Our interest was in bringing greater awareness of the discipline of geography to the DH community, and not focusing only on spatial analytical methods associated with particular GIS software packages and the libraries available for programming languages like Python and R. To date the SIG has not engaged with the cultural and critical geography communities, but the postulated dividing line between quantitative and qualitative is not fixed or sharp in my view. In many fields there is barely a dividing line. Research based on interviews, for example, entails encoding

and annotating natural speech and texts, then performing statistical analyses, and finally a qualitative (and often contestable) interpretation of those results. Such mixed methods seem to me very appropriate for many historical humanities studies and are not uncommon.

The term spatial humanities is seen far more frequently than geohumanities for a few reasons, I believe. It was the title of a successful 2009 NEH-funded project at the University of Virginia and the name stuck. Spatial humanities was the title of an influential edited volume subtitled 'GIS and the Future of Humanities Scholarship' (Bodenhamer et al. 2010), and it was subsequently adopted as the title of research initiatives at the University of Indiana and Lancaster University. By contrast, another edited volume (Dear et al. 2011) titled 'GeoHumanities,' is tellingly subtitled 'art, history, text at the edge of place.' Finally, it seems evident that many non-geographers are reluctant to use the term 'geographic' or the prefix 'geo' because it is a marker for an academic discipline that is not their own. The same is not true of the term 'spatial,' which is trans-disciplinary. This deference is natural and commendable, but a side-effect is that the discipline of geography is downplayed.

The term 'geospatial humanities' seems like an appropriate compromise, but 'spatial humanities' has had a head start. It is less important that we end up with three labels for what is essentially the same research activity than that this interesting and useful work is pursued.

Furthering the field with collaboration

The more frequently members of the GIScience and Humanities research communities publish in each other's journals and present at each other's conferences, the more transdisciplinary collaborations will follow. One option is to organized geospatial humanities-themed pre-conference workshops at conferences in both domains, such as the one in Utrecht mentioned earlier. Also, to the extent spatial research and methodologies in both communities become spatial-temporal in practice, the more GIScience will become relevant to historical research. The following are further ideas for forging more connections between the domains.

<u>On the GIScience side:</u>

- Greater recognition of the value and relevance of historical questions to modern day societal and policy issues. Case studies in GIScience are dominated by modern data and modern problems, e.g. wayfinding (including recommender systems), social media, and movement optimization for emergencies.
- Work on generalized spatial-temporal models tends to use modern and/or environmental data as examples. Many of these could be applied to

historical questions, but the models and related software are experimental, and require computational expertise to manipulate; i.e. they are not available as "ready-to-use" solutions and their implementation is beyond the capability of most humanities researchers.
- If more GIScience research used historical textual data as exemplars, and tackled its attendant problems of quality, more humanities researchers might see ways to use geospatial methods in their own work. This has begun in the sub-fields of geo-semantics, Linked Data and gazetteers.

On the humanities side:

- Many digital humanities researchers defiantly view some of their representation challenges as insurmountable, e.g. various forms of uncertainty ("approximately", "between A and B", "probably", "possibly", "not before"). Engaging concretely on such issues with an open mind would benefit them greatly.
- Geometric representations of vague regions get a similar reaction. Solutions can be cartographic or educational in some combination. For example, region labels on maps are well understood to be imprecise, and producers of digital historical works can do a better job of communicating their epistemological assumptions and managing users' expectations.
- The historical method is empirical, i.e. evidence-based, and rigorously analytical, yet railing against positivism is commonplace amongst many historical scholars. Historians may not use the term "explanatory variable," but they certainly have them. It is probably best if GIScientists confine their outreach to self-described practitioners of the *digital* humanities.

Benefits

GIScience practitioners and humanists can learn from each other, and also I believe learn of non-obvious similarities in their respective methodologies. It is worth noting that all academics are to some extent invested in differentiating disciplines more so than finding common ground. Perhaps the concepts of 'place' and 'region' make a natural common ground: place conceived most generally as experienced space, and regions both as natural places and analytical computed objects.

Most DH practitioners' research is historical and a large proportion of historical evidence is textual. That evidence contains a great deal of embedded spatiality, and researchers want not only to map place references, but to understand the conceptions of geographic space and of experienced places of that period. The encoding of spatial and 'platial' references in texts for subsequent analysis is an area that would benefit greatly from contributions by GIScientists. In another vein, GIScience and spatial information theory are not limited to

quantitative and computational methodologies, but include numerous topics related to spatial cognition, i.e. spatial thinking. 'Historical spatial thinking' seems promising as a new field of inquiry, or given the naming issues described above it should be 'historical geographic thinking.'

Answers by Yingjie Hu:

Answer to Question 1:

As a junior GIScience scholar, I have not had a chance to complete a project with humanities scholars yet. However, I recently started to interact with some humanities scholars as my interest in geospatial humanities grows. It is indeed extremely important to keep an open mind and be willing to accept the discomfort that will inevitably happen sometimes. I think this discomfort comes from two sources. One is the ignorance of the work that has already been done in some other areas. For example, I recently discussed my work on extracting place names from texts with a professor of Classics, and he informed me of a related project done by a professor in the Department of English. As scholars, we often feel uncomfortable if there exist some related studies that we do not know. However, such situations are probably inevitable since we may not be familiar with research published in journals in fields we typically do not follow and in academic communities with which we have not yet interacted with. The second source of discomfort may come from different ways of doing research. GIScientists tend to think spatially and quantitatively, while many humanities scholars may prefer to use a storytelling approach to organize ideas. These different ways of doing research may conflict during collaborations.

To make these interdisciplinary collaborations truly effective, I think we should anticipate and embrace the discomfort. Sure, ignorance of studies in other fields will make us feel uncomfortable but we are also learning a lot about the progress on this topic in other domains. Sure, researchers in different fields will have different ways of doing research, but combining these different ways may give us a more comprehensive picture of the topic being studied. In terms of the benefits of such collaborations, funding support is a clear one, since many funding agencies, such as NSF and NEH, explicitly require the research team to be interdisciplinary in some of their FOAs (e.g., the recent NSF Convergence Accelerator). In addition, scholars from GIScience and humanities can learn from each other and help increase the impact of both fields.

Answer to Question 2:

I think moving towards the geospatial humanities needs the recognition and appreciation of different research methods. Quantitative and computational methods can help us systematically analyze a large volume of data within a

reasonable amount of time. For example, we can quickly grasp the main ideas of a collection of one million news articles using topic modeling (an automatic natural language processing technique), whereas it is highly difficult, if not impossible, for anyone to manually read these news articles and understand their main content. Qualitative approaches, on the other hand, are necessary for us to achieve a deeper understanding of some data. For example, topic modeling does not tell us the exact story of each article, and a better follow-up approach is probably to sample some news articles from each identified topic, and then use qualitative methods to analyze these news articles. In addition to acknowledging the value of different research methods, it is also important to hold events (such as the 2019 UCGIS Symposium) to bring scholars from different areas together to exchange ideas and foster collaborations.

Answer to Question 3:

I think a curriculum for geospatial humanities should aim to equip students with the abilities of critical thinking and spatial thinking as well as hands-on technique skills to answer humanities questions. To achieve this goal, an undergraduate curriculum may have the following courses:

Required courses (9 courses):

- **Introduction to geospatial humanities** (What are the geospatial humanities? What are the basic concepts, such as space and place, in the geospatial humanities? What are the typical questions asked and answered in the geospatial humanities?)
- **Introduction to GIS** (Basics about geographic information systems, cartographic principles, and spatial analysis methods)
- **Computer programming** (An intro-level programming course based on Python or R)
- **Quantitative and qualitative analysis methods** (A course that introduces students to both types of methods and examples that use mixed methods)
- **Spatial and textual analysis for geospatial humanities** (A course for helping students learn spatial and textual analysis methods for processing corpora data)
- **Geo-social network analysis** (A course for helping students analyze relations between people and places)
- **Data visualization** (A course for helping students learn how to visualize their data and analysis results)
- **Data collecting and sharing in geospatial humanities** (A course that teaches students where and how to find existing data, how to collect data themselves, and how to share the data they have collected on public-accessible repositories)

- **A capstone geospatial humanities project** (A course where students will propose a project idea, form interdisciplinary teams, and complete the project together)

Elective courses (students should select at least 3 courses from a list of courses from other departments, such as art, communication, history, English, classics, and so forth; some examples, based on the courses offered at the University at Buffalo, are provided below)

- Art and life
- Mass media and policy
- Machines, codes, and cultures
- Literature and technology
- United States history
- Greek civilization
- ...

A graduate curriculum may be based on similar courses in the undergraduate curriculum but adds a number of research-oriented courses, such as:

- Colloquium on geospatial humanities
- Research design for geospatial humanities
- Graduate independent research
- ...

I think a good way to help students learn how to conduct multidisciplinary, interdisciplinary, and transdisciplinary collaboration is to encourage them to do such collaborations in their course projects. We can start this geospatial humanities program as a minor which is open to students from all majors. By doing so, we can hopefully attract students from various departments. During course projects, we can encourage students from different departments to form interdisciplinary teams and work together. Through these projects, students may gradually enhance their skills in interdisciplinary collaborations by learning how to interact with people from other fields and how to understand and appreciate different views and methods.

Answers by James Thatcher:

In preparing for and reflecting upon the panel, *Integrating Space and Place in GIScience*, participants were charged with three questions revolving around what transdisciplinary research between GIS and the humanities looks like and how it might be conducted. Due to the shared themes between questions, this response will inevitably leap between the questions; but, the over-arching structure will

focus upon the first and the third. I will also endeavor to keep some of the conversational tone which made the panel itself so informative and far-reaching.

The first question asked what it will take for collaborations to become truly transdisciplinary and what the benefits of such approaches would be. To answer this question, I want to pivot a bit away from the 'humanities' and towards a more general discussion of bringing the lens offered by disciplinary geography – not just GIS or GIScience – into conversations with other disciplines and what that matters. The 2019 UCGIS Symposium was hosted in Washington, D.C., and as such made an appropriate venue to discuss how transdisciplinarity could better inform discussions around electoral districting.

Glossing over a host of details in the interest of the space of this forum, it is necessary to note that in the popular press as well as in many court documents, discussions of fair and just electoral districting often center around mathematical measures of compactness on a Euclidean plane (although there are exceptions, see *Navajo Nation v. San Juan County*, 2019). Those measures, usually derived from topology and geometry, assume that space is flat and frictionless and that movement around a district occurs in straight lines. Such an approach works, right up until someone hits a river without a bridge, a several blocks long skyscraper, or any one of the number of *things* that make how humans move through space (and create place) both complicated and fascinating. When we take such considerations into account, we are able to ask questions about districts that move beyond Newtonian, absolutist representations of space and begin to ask questions like: what are communities of interest; what are neighborhoods; how, where, and when do these categorizations emerge; and what do they mean for fair and just representation within a democracy?

These are profoundly ***geographic*** questions, but they push at the boundaries of GIScience which, at least in recent history, has been more focused upon analysis within quantitative, discrete models of space than engagements with bendings, foldings, and twistings thereof (see O'Sullivan et al. 2018 for a discussion on the historical reasons for and exceptions to this). Returning to districting itself, a transdisciplinary approach brings topological constructs and computer science algorithms into direct conversation with critiques of epistemology, ontology, and being-in-the-world. There is ultimately no perfect solution to the problem of representation, lines in a map will always mark inclusion and exclusion, recognition and elision; and, personally, I am far less concerned if that consideration comes from human and radical geography or from the sometimes amorphously titled 'humanities' than I am that such considerations are always foundational to the questions being asked and the methods undertaken.

It is far too easy in our current moment to become swept up in purely quantitative representations; the data spectacle has been both commercially and academically valorized (Gregg 2015). Transdisciplinarity requires an approach that sweeps away that *sui generis* solutionism that demands radical, a-contextual

disruptions of the present as the only approaches worth pursuing; instead, it roots research within the sociotechnical milieu in which we live, deepening historical ties, and opening up alternative voices for consideration.

The third question posed asked what a curriculum for the geospatial humanities might look like and what the dangers of operating inter- and trans-disciplinarily within the neoliberal university might be. The geospatial humanities, if they are to grow, offer a potential path forward for a curriculum that, at least in my experience, has too often become an overly reified ritual of button pushing in what ultimately amounts to little more than 'Excel, but for maps!' The geospatial humanities, then, offer the opportunity to resurrect GIScience as an always transdisciplinary praxis, one that requires an understanding not only of technology, but also theory itself, as situated within a sociotechnical milieu wherein the creation and understanding of space and place are recursively informed by and inform both current technologies and social norms. At the most banal, this can be understood simply through funding mechanisms. As pure as one's work may be, what gets funded is always influenced by social and political situations as well as the methodologies allowed by various technological systems.

In order to achieve this, the geospatial humanities must be more than 'the importance of the humanities, but this time we used some python so you won't cut our department;' instead requiring a (re)thinking through of where the gaps between the close and distant readings that permeate the humanities and GIScience emerge, one never fully obfuscating the other. And, yes, this call is dangerous. It is significantly easier to not consider the very real limits and problems with your research, to not make it open to outside voices, ontologies, and ways of being in the world. That work is hard, takes time, and necessarily invites further critique.

Far simpler to say 'this is the truth and here is the math that proves it' and move on to the next, well valorized, project. *Look at how many data sets I have analyzed. Surely that is significant, is truth?* But, such an approach is a disservice to our society and to our students. Instead, a curriculum in the geospatial humanities must not simply ask how, but also what, where, when, and why. Ultimately, also, why not?

Panel on Wednesday, June 11, 2019:

BUILDING A BRIDGE TO THE HUMANITIES WITH GISCIENCE

Participants: Ed Ayers, University of Richmond; Kathy Hart, Library of Congress; Robert Tally, Texas State University.

Answers by Ed Ayers:

If you will excuse me, I need to sketch my own path through the digital humanities and geography so you will see where I am coming from. In graduate

school in the 1970s I used the computers of the time for what is now simple statistical work but what at the time involved mainframe computers, punch cards, and massive printouts. In the 1980s, I did mapping, still using mainframes but this time using remote terminals and batch jobs. The mapping required enormous work and then had to be printed out on a vast printer, state by state, cross-hatching by cross-hatching, before I could see the mistakes I had made. In the 1990s, I helped instigate one of the first web-based digital history projects, the Valley of the Shadow, fundamentally defined by geographic questions: how different were the American North and South and how did those differences led to the Civil War? I co-authored, with my friend Will Thomas (Thomas and Ayers 2003), a native digital peer-reviewed history article in the *American Historical Review* from that archive, using GIS, and wrote two books. In 2007, when I went to the University of Richmond as president, I founded the Digital Scholarship Lab, which has focused ever since on visualization, especially mapping. My colleagues – a historian gifted in coding, a GIS specialist, and a visual designer – have been building *American Panorama* since then, a digital atlas of US history involving a range of innovative techniques. I am trying to contribute now to the collective enterprise through a project called *Southern Journey: The Migrations of the American South, 1790–2020.* It is based on GIS by my colleagues, using areal interpolation of census data to track the movements of white people, black people, and immigrants from abroad over those two centuries. The final product will be, of all things, a book. Louisiana State University Press has agreed to publish 80 full-color maps in a landscape orientation. The maps are the basis of all my arguments, but those maps have to be translated into linear language to be an argument that other people can understand, and a book seems the best technology for extended text.

History, to address the panel's questions, has not quite known what to do with the more analytical, technologically enabled component of geography. That is in part because history is, at heart, a humanistic discipline rather than a social science. History tends toward the singular and particular, toward interpretation rather than generalization, toward the narrative rather than the model. Each representation tends to be handmade, custom-built. Unfortunately, the patterns I see in my maps of migration, intricate and shifting, are too complex to explain easily in words or even numbers. We can see more in the maps than we can say in a reasonable number of words. As the geographer Donna Peuquet points out, 'the linear (i.e., one dimensional) nature of language is ill-suited to represent the higher dimensionality of a spatial information.' As she wryly challenges, 'try verbally describing the shape of Canada or the United States.' Therefore, the challenge is to combine the obvious strengths of geographic understanding with the focus on the ineffable, the irreducible, the singular, that are at the heart of history. The problem is how to integrate structure, process, and event, how to

combine space, place, and time. For all their inadequacy, words are necessary, narrative is necessary.

I think we are seeing at this conference how to proceed with another of the panel's questions on how to make a *truly transdisciplinary research effort?* We need to think of important questions and then assemble a team to address them. The key is that all participants receive a meaningful return within their own discipline. We have to acknowledge that academic careers are organized by disciplines. Our universities are basically disciplines incarnated in bureaucracy. Tenure, promotion, and advancement are geared toward reproducing the discipline, advancing the discipline, promoting the discipline. Whether that's for the best or not is not the issue for people who are trying to build careers in the existing structures.

For the humanities, geospatial scholarship will be read by our peers as digital scholarship. I chaired a commission for the American Historical Association to address the place of digital scholarship in hiring, tenure, and promotion in 2015 and we told departments, deans, and provosts something that may seem obvious to other disciplines, but is not for history: 'Since digital scholarship often includes collaborations, departments should consider developing protocols for evaluating collaborative work, such as co-authored works, undergraduate research, crowd sourcing, and development of tools.'

Collaboration is a problem for history because quantitative history, drawing from sociology, economics, and political science, died a quick death in the 1980s. Statistics, historians decided, are not well-suited to historical explanation, which are about non-reproducible events than about correlations and regressions. Standard statistical techniques, even proportions, cannot explain things because they wash out geographic variation and pattern. History turned toward culture, especially anthropology and literary theory. Fortunately, geography was not besmirched by its association with the quantitative disciplines. Most historians do not understand that geography is not only cartography. They would be shocked to look into your journals and see that many articles have no maps at all. That misunderstanding is good, because geography may be the most productive form of digital scholarship to integrate with history. Maps, even those profoundly quantitative in origin, will need to be interpreted in a humanistic language, but that is an exciting opportunity.

Geography 'has sometimes been called *the* bridging discipline or an *interfacing* or *fusing* discipline,' geographer Stanley Brunn argues (Ayers 2010, 2). History deals with the other defining context in human life: time. Maps and historical narratives are deeply complementary. As D. W. Meinig, a pioneering practitioner of both disciplines, argues, 'geography, like history and unlike the sciences, is not the study of any particular kind of thing, but a particular way of studying almost anything. Geography is a point of view, a way of looking at things. If one focuses on how all kinds of things exist together spatially, in

areas, with a special emphasis on context and coherence, one is working as a geographer' (Meinig 1992). If we substitute 'temporally' for 'spatially' in the preceding sentence, and exchange 'historian' for 'geographer,' we are describing history. History and geography are capacious, welcoming disciplines. The two have a lot to say to another if we can only find a common language.

Answers by Katherine Hart:

Librarians, such as myself, work and support the geohumanities through access to and expertise with, maps and geographic information. My views come through a library lens on what librarians provide individually through expertise and as collaborators, and what library organizations provide through infrastructure and collections.

Libraries are a natural bridge. They are neutral territory on campus – connected to the humanities broadly as well as a bridge to the humanities within GIScience. Librarians provide an *entrée* to collections, infrastructure, and techniques that support geohumanities research. The collections include texts, maps, photographs, manuscripts as well as statistical and geographic data. Librarians also provide expertise and training on software and tools as well as the infrastructure necessary for geohumanities research, such as digital repositories, copyright, project management, metadata, data management plans, preservation and sustainability, research and scholarly communication, and the organization of information. Librarians work in a transdisciplinary model, often with deep subject expertise and advanced degrees, but they are capable of working across disciplinary lines. Libraries are often the sites of digital humanities centers, sometimes in collaboration with an academic unit, that provide training on digital methods and tools, a focal point for seminars and lectures, and computer labs that serve as spaces for exploration.

Be open to collaboration with librarians/archivists/museum curators – all are professionals with expertise in their fields. Effective and fair collaborations define the scope and extent of work, acknowledge labor, and are appropriate regarding co-authoring. When writing grant proposals, speak to the data management and scholarly communication librarians who will support the data management plans, as this will result in stronger grant proposals. Librarians are effective collaborators and bring a range of interdisciplinary skills to collaborations, including how to create and support successful collaborative work. On this topic, the 'Memorandum of Understanding Workbook' (Mirza, Currier, and Ossom Williamson 2010) supports clarifying expectations, document decisions, and standard language.

Librarianship is extremely interdisciplinary. Professional librarians build their academic credentials through a library or information science (MLIS/MIS)

master's degree added to a bachelor's degree in any discipline. Some of these master's programs offer a specialization or certificate program, such as in archival studies, digital preservation, or other areas. In the past dozen years or more, many former library-focused master's programs have shifted their focus to a 'school of information' model, moving more prominently into information science rather than traditional library science. You see the obvious overlap between the 'i' in the information schools and the 'I' in 'G-I-S.'

Many GIS professionals who work in libraries, however, do not hold a master's degree in librarian studies, although they do much of the same work as librarians. There are many examples of GIS professionals employed and doing fabulous work in libraries. However, there are gaps in the training and education for this particular librarian specialization. Since the time GIS was introduced to universities and libraries, approximately twenty years ago, there have been only a few graduate library or information programs that provided a cartography, GIS or geographic information course, much less a formal specialization. Librarians who specialize in maps and geographic information may have acquired expertise through coursework or experience prior to their master's librarian and information science program, but often they have learned on the job. They may have taken a GIS or cartography course through a geography department, which is how I learned about GIS.

Geo-librarians have focused on geo-related librarianship education and work to close that gap by building curricula to focus on the skills needed to be a successful geoinformation librarian, and much of these skills cross over into the geohumanities. The first attempt to outline this professional specialization was my co-authored work titled 'A New Model of Geographic Information Librarianship: Description, Curriculum and Program Proposal' (Weimer and Reehling 2006). Among the proposals was to co-list and co-teach LIS/iSchool and Geography/GIS courses in a joint certificate. Soon after, the American Library Association's Map and Geographic Information Round Table, which I led, defined the core competencies for map and GIS librarians (ALA MAGERT 2008). Those two documents were foundational and used as building blocks for a 2012 IMLS Institute of Museum and Library Services funded project which was part of the Laura Bush Twenty-First Century Librarianship Program. Wade Bishop and Tony Grubesic developed a curriculum for Geographic Information Librarianship that expanded upon the general concepts found in the LIS curriculum with a deeper focus on geographic topics, including geographic metadata creation, geographic information collection, copyright and the licensing of geographic information. The curriculum also focused on tools, such as GIS software, that facilitate instruction and use of geographic information based on the cartographic principles of scale, projection, grids,

and geographic coordinate systems. Taking these concepts a step further, Bishop created a model curriculum at the University of Tennessee iSchool which includes two electives focused on geographic information to supplement required courses (University of Tennessee 2019).

As mentioned earlier, numerous digital humanities centers offer a digital humanities certificate. Often this is a 12-hour minor that is added to a student's graduate degree. These certificates are built upon existing courses and often require a three-hour individual research project. For example, UCLA offers a graduate certificate in the digital humanities with the stated goal to provide students with knowledge about the tools, methods, and theoretical issues central to digital scholarship. Topics include text analysis, data mining, visualization, modeling and simulation, geo-spatial and mapping, and others. The courses in the certificate are from liberal arts, computer science, visualization, archaeology, religious studies, library and other programs. (See https://dh.ucla.edu/ for details.)

There currently are 390 GIS certificate programs in the United States (personal communication with Diana Sinton, Executive Director of the UCGIS, on June 12, 2019). How many are on campuses co-located with a masters LIS program, or support a digital humanities center or certificate? For those of you who are on these campuses, and even for those of you who are not, I implore you to seek out educational partners to build certificate programs or co-list classes in library and information science as well as in digital humanities. This strategic disciplinary collaboration will expand expertise and understanding that support GIScience as well as the geohumanities. To support this panel session theme of building bridges, I encourage you to build a bridge with the digital humanities center or working group on your campus, or to seek out those engaged in geohumanities projects. Attend their guest lectures and other events. If there is not yet a geo-perspective in the digital humanities center, find a way to fold in your interests in GIScience and the geohumanities. Talk to you library liaison and faculty in library or information sciences. Go build the bridges!

Answers by Robert T. Tally Jr:

The spatial turn in the humanities and social sciences has been marked by an enhanced awareness of space, place, and mapping and of their significance, but in practice the wide variety of approaches, methods, practices, tools, and technologies employed by those involved in spatially oriented research and teaching makes it difficult to characterize this work without gross oversimplification. Within my own area of study, literature, various spatially oriented approaches have emerged over the years, and while it is true that most critics would find that such practices as geocriticism, literary geography,

literary cartography, geopoetics, and spatial literary studies frequently overlap in intriguing ways, others would argue that they are quite distinctive and ought to remain separate. Compared with spatially oriented work outside of literary studies entirely, these practices seem all the more distinct and separate.

For my own part, I have tried be remain somewhat ecumenical in my support for spatial literary studies, broadly conceived, even if the work I engage in through my own writings may be rather different from that undertaken by others. My edited book series, 'Geocriticism and Spatial Literary Studies,' includes works of literary criticism dealing with geography, architecture, urban studies, international relations, regionalism, and so on. This could also include work by scholars making use of GIScience and GIS, I would hope, as well as those engaged in other forms of literary geography. Although this work is interdisciplinary to a certain extent, I must also admit that disciplinary boundaries still hold up and, indeed, still matter. While working across departmental lines remains an admirable goal in the main, I worry that in many cases, so-called interdisciplinary research can risk becoming simply undisciplined. Disciplinary boundaries are artificial, of course, but that makes them no less significant, and these distinctive fields have emerged, developed, and taken shape mostly according to good faith efforts of a diverse array of practitioners desiring to clarify the methods and goals of their work, even if the results may later take the form of administrative divisions and bureaucratic hierarchies. True, the definitions of a given field of study can sometimes appear to be constraining, and I would be the last person to say that literary critics should read only other literary critics, as if it scholars ever limited their reading to their own narrow specialization. But sometimes those with inadequate knowledge or training in certain fields, often with the best of intentions, diminish the value of this research by too blithely ignoring the academic and intellectual rigor demanded by different fields.

For example, I am not qualified to do the work of a geographer, still less of someone knowledgeable about GIS, and to the extent that my writings on literary cartography may partake of the insights of professional geographers or may brush up against aspects of what they do, I hope that I always show due respect to those particular knowledges and practices developed within those disciplinary fields that are well beyond my level of expertise. We must remain careful, and indeed *critical*, when it comes to our interdisciplinary work and to the collaborations that facilitate it. By engaging in inter- or transdisciplinary research and teaching, we do not want to lose what is most valuable within the disciplinary formations that have constellated themselves in productive ways historically and in our own time.

As with my non-specialized sense of 'spatial literary studies,' where the word *spatial* serves as a broadly understood adjective, terms like the 'spatial humanities' or 'geohumanities' should have a very wide application, so as not

to exclude or to specify qualitative versus quantitative research, for instance. Were it up to me, any spatially oriented approach to humanistic study would fall under the broader category of something like the spatial humanities, whether it involved GIS-science or geopoetics, geocriticism, literary geography, and so on. I understand, however, that even rather useful labels have a tendency to become brands and that brands then circulate and compete with others. For example, in a review of *The Routledge Handbook of Literature and Space* (2017), a proponent of literary geography has criticized spatial literary studies for being insufficiently oriented 'toward geographical and, more generally, social science aims and methods' (Hones 2018). Here as elsewhere, in an effort to defend one's turf from encroachment, one winds up establishing and policing new disciplinary borders.

Such terminological disputes, carried to their logical conclusion, would result in each named scholarly practice ossifying into a new, more strictly defined mini-discipline. This in turn means that the erstwhile interdisciplinary research represents merely a preliminary stage in a process leading toward ever greater and more jealously guarded disciplinary territories. Regardless of my reservations about a too facile sense of interdisciplinarity, I certainly hope that we who are interested in these ideas would not want to move too forcefully in the other direction, that is, by establishing rigid borders between putatively interdisciplinary fields like the spatial humanities or geohumanities. If the phrase *geospatial humanities* helps, then I am all for it, but I would like to believe that these various forms of scholarship, criticism, and pedagogy – all dealing with space, place, mapping, spatial relations, and so forth – could both coexist and fruitfully inform one another.

Along those lines, I am gratified to see such enthusiasm for forging connections among these various forms of research and teaching. My *Topophrenia: Place, Narrative, and the Spatial Imagination* (2019) appears in David Bodenhamer, John Corrigan, Trevor Harris's excellent 'Spatial Humanities' series at Indiana University Press, even though those editors knew my work did not involve GIS at all. I am delighted to see the diversity of approaches on display in such seminal collections as their *Spatial Humanities* (2010) and *Deep Maps and Spatial Narratives* (2015) as well as in the monumental volume *GeoHumanities*, edited by Michael Dear, Jim Ketcham, Sarah Luria, and Douglas Richardson (2014), books that have themselves led to so much more research in recent years. Collaborative project, such as the excellent *Narrating Space / Spatializing Narrative*, co-authored by narratologist Marie-Laure Ryan and geographers Kenneth Foote and Maoz Azaryahu (2016), offer other intriguing possibilities. And, finally, I acknowledge and thank everyone at the symposium devoted to 'the geospatial humanities' and to the transdisciplinary opportunities explored there. I feel confident that however these lines of inquiry are followed, transgressed, extended, and ultimately

transformed, we will be making critical contributions to our understanding and interpretation of the world we live in, which is after all crucial to the process of changing this world for the better.

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