Chapter 1

Introduction

Figure 1.1 The Lascaux Cave paintings (Hall of Bulls). Photo courtesy of Jack Versloot (http://flickr.com/photos/80749232@N00).
From Lascaux to the Sea of Tranquility

The series of Paleolithic paintings of humans, animals, and cryptic signs that adorn the stone walls of the Lascaux cave complex in southwestern France (figure 1.1) bestow on humanity a 20,000-year-old tableau that we can appreciate, in an ontological sense, as one of the earliest humanities GIS models ever created. To literal minds, the images perhaps represent no more than the esoteric daubs of our ancestors huddled in fear around a primordial fire. To imaginative minds, however, the creative use of pigments, derived from local flora and fauna, illustrates a prehistoric knack for storytelling, artistry, and technological prowess. Indeed, these cave paintings, because they unambiguously plot the human-environmental interactions of hunter-gatherers, act as a primal GIS created to convey the “spatial stories” of a nomadic people still in thrall to the great myths and mysteries of the universe.

Fast-forward to the late twentieth century. We see Homo sapiens chart the solar system and navigate an Apollo rocket and lunar module to the Sea of Tranquility on the surface of the moon. Through its portal, we gaze back on an earthrise from the module’s hi-tech cave. Now we cue the spool of history to the present to witness the digital revolution creating waves that ripple through the sciences, arts, and humanities. Amidst this great change, words such as mapping have emerged as important metaphors. In the arts and humanities, scholars navigate texts and explore the spatial and geographical dimensions of literary, cultural, and historical works. Indeed, these spatial and cultural turns reveal that there are still many regions of terra incognitae left to explore and map.

Drawing on tropes in the spatial and digital humanities, literary theory, and critical thought, this book illustrates how geographers can model and apply GIS techniques typically employed in the natural and social sciences to literary, cultural, and historical studies. This book takes the view that a humanities GIS model provides a discursive and artistic platform that we can use to visualize and spatialize stories and plot conventional empirical narratives. In addition, GIS can also be employed to perform ergodic and deformative interpretive mappings of literary, cultural, and historical works; create innovative, interactive digital texts; and foster insightful mapping experiences. This book targets students, researchers, and academics engaged in the digital humanities and anyone interested in how location, place, and space can illuminate their respective area of study.

What is a GIS?

For centuries, maps were sketched painstakingly by hand with materials such as ink, papyrus, sheepskin, parchment, and paper. The transition from traditional forms of mapmaking to interactive, digital mapping platforms, such as GIS, began in the late twentieth century. In our age, geocoded digital images proliferate, conjured on plasma...
screens by fingertip strokes on cybernetic keyboards that parse signals from earth-orbiting satellites. In the 1970s, computer mapping introduced the first digital maps and automated the drafting process from the sketching table to the computer screen. In the 1980s, electronic database systems linked to digital maps, which allowed the visual display of multidimensional data variables and provided the foundation for many GIS systems operating today.

A geographic information system, or GIS, provides a digital platform upon which multiple map layers (called shapefiles and rasters) electronically stack on top of each other to create composite images. Each shapefile layer and its attendant data table display unique variables (represented as points, polylines, and polygons). Layers can also be composed of a pixelated terrain or map images called rasters. The GIS operator digitally manipulates the order of the stacked layers and associated data tables, creating any number of connections between the spatialized variables to produce composite mappings, visual representations, and spatial models for analysis.

GIS software offers the potential to orchestrate, analyze, and visualize spatial stories as numerous as the shapefile and data variable combinations GIS operators can make. Collectively, as David Staley notes,

*Geographic information systems are one example of a suite of technologies—from data mining to immersive virtual reality displays to complex mathematical spaces—that have been collectively labelled “information visualizations.” A visualization is any graphic that organizes data into spatial forms for purposes of display, analysis, interpretation, and communication.*

Traditionally, GIS technology has engaged Cartesianism and Euclidian geometry with positivist methodologies to create what the historian Michel de Certeau describes as “a formal ensemble of abstract places.” Similar to cartographic tools that translate the perceptible world onto a legible tableau, GIS constitutes an “abstract machine” designed to create conceptual spaces in which users can collate and then quantify, geocode, and visualize singular events and larger patterns to produce a qualitative “collage of moments.” The space-time backgrounds created by this combination of cybernetic systems and software languages produce a “qualulative” world in which calculation is defined as not necessarily being precise and super-computing technologies, qualitative choices, and ambiguity empower users to explore place and write space in different ways, both literally and metaphorically. In this new world, GIS can be configured for use beyond positivistic endeavors and applied with innovation and imagination to the *terrae incognitae* of the humanities.

In this regard, a humanities GIS model provides a phenomenological tool that brackets events and patterns in both time and space. GIS can help users devise methodologies that are both quantitative (plotting geometric and numerical data relationships) and qualitative (juxtaposing attribute data relationships) to tackle important questions in literary, cultural, and historical studies. (See examples of the former in chapter 3 and the latter in chapters 4, 5, 6, and 7.) Whether a GIS is employed for quantitative or
qualitative research, the selection of data involves a high degree of subjectivity—a trope with which arts and humanities scholars are conversant. Using GIS, these scholars can employ a spatial lens and apply many perspectives and analyses to any given subject by combining shapefile layers, data variables, and methodological approaches gathered from the sciences, the arts, and the humanities.

In the preface, GIS is defined as an “abstract machine.” For the humanities, the significance of this abstract machine lies in its potential to contextualize the system’s hardware and software nexus in a discipline that employs human and electronic cybernetic systems to advance our understanding of physical and social systems. According to Donna Haraway, the cybernetic perspective of the late twentieth century emerged when innovators began to theorize human interactions with technology and fabricate the machine-organism hybrids called cyborgs. This perception encouraged a mass proliferation of cybernetic assemblages that technologically disrupted Western ontologies and epistemologies. Far from being deterministic or dystopian, however, “cyborg imagery can suggest a way out of the maze of dualisms in which we have explained our bodies and our tools to ourselves . . . it means both building and destroying machines, identities, categories, relationships, space stories.” At its basic level, GIS constitutes a language of abstractions—a spatialized and cyber syntax articulated by cyborg authors who digitally reproduce perceptions of physical and social systems in codescapes of algorithmic, computerized commands.

This capacity suggests a cybernetic map—to parse Gilles Deleuze and Félix Guattari’s aphorism, in which “there is no longer the tripartite division between a field of reality (the world) and a field of representation (the book)—or the map—“and a field of subjectivity (the author)”—or the mapmaker. The digital architecture of GIS software can be considered as an abstract machine that deterritorializes an individual’s phenomenological sense of place by geometrically projecting idiosyncratic perceptions of the environment onto a coordinated grid system. The result is an abstract space that can be navigated, mapped, and studied. This is the dominant spatial perspective, epistemology, and methodology employed by most GIS practitioners. However, from a post-structural perspective, GIS can be conceived as a topographical hermeneutic system operating on an inter-textual platform that employs a spatial and cyber syntax to produce the postmodern notion of a digitally visualized mapping text. As discussed more fully in chapter 2, we can employ GIS to explore and survey “rhizomatic” spatial relationships and networks linking literary, historical, and cultural scales and networks on multidimensional levels (figure 1.2).

In Deleuze and Guattari’s terminology, GIS constitutes an abstract machine that scholars use to pilot through space that does not represent something real so much as it constructs a reality that is yet to come. This concept suggests not only an image-making technology but, more importantly, a technology that facilitates information transfer, knowledge production, and communication. GIS orchestrates a chain of practices and processes that gathers geographical information and constructs imaginative geographies. The paths that a humanities-oriented GIS may follow, therefore, are many.
GIS and the digital humanities

Scholars in the humanities have explored the relationship between geography and literature from cartographical and theoretical perspectives. Key examples range from Franco Morretti’s (1998, 2005) schematic and Marxist geometrical approaches to literary studies to Barbara Piatti’s ongoing project to map the fictional and actual locations of literary works. Bertrand Westphal’s “geocritical” approach explores the overlapping territories of physical geography, cognitive mapping, and literature by plotting the geometric and philosophical coordinates of real and fictional space through the conceptual lenses of spatiotemporality, transgressivity, and referentiality. At the same time, a number of edited volumes have helped to further engage GIS in the humanities in both practical and theoretical ways and deepen the perceived connections between cartography, theory, and literature.

Building on these works, I have created humanities GIS models that combine and perform ergodic and deformative readings of Irish literary, cultural, and historical texts.
Staley notes that in a typical written narrative, elements of a story operate in a linear pattern, with a beginning, middle, and an end. A spatial narrative can have a linear pattern (as in tour-style maps), but other forms of meaningful patterns can unfold in two or more dimensions. By departing from classic Aristotelian linear narrative, ergodic approaches in GIS—those that require work from an author-reader—can model complex spatial relationships between the author's construction of a text, the tabulation of archival data, and a viewer’s choices. This type of storytelling in GIS provides an interactive platform from which to synchronize layers of images, words, numbers, and vectors into simultaneous and multidimensional narratives.

In contrast to ergodicity, deformation is a literary-criticism technique developed in the digital humanities as a key methodology for textual analysis and data mining. The approach combines two words, performance and deform, to construct an interpretative concept premised on deliberately misreading a text—for example, reading a poem backward line by line. In Reading Machines (2011), Stephen Ramsay notes that computers enable scholars to practice deformance quite easily—to take apart an epic poem, for example, by focusing only on its nouns or by calculating the frequency of collocations between character names in a novel. Chapters 5, 6, and 7 of this book specifically test GIS-framed, deforming mapping models of the texts and biographies of three authors. Jerome McGann and Lisa Samuels contend that this interpretative technique applies scientia to poiesis to elucidate the relationship between two discourse forms. Furthermore, they argue, this method seeks to explain a unitary and unique phenomenon, rather than establish a set of general rules or laws.

In addition to the application of ergodic and deforming techniques, this book situates humanities GIS in the fields of multimedia art, design, and culture. Here, according to Andrew Mactavish and Geoffrey Rockwell, humanities computing falls in league with the visual and performing arts by legitimizing technological practice and the creation of non-textual scholarly artifacts. The use of GIS in this context illustrates Alan Liu’s point: beyond acting in an instrumental role, the digital humanities broaden the very idea of instrumentalism, technological and otherwise. Lev Manovich predicts that the systematic use of large-scale computational analysis and interactive visualization of cultural patterns (made possible with GIS) will grow into a major trend in cultural criticism and the culture industries in the coming decades. Manovich asks: “What will happen when humanists start using interactive visualizations as a standard tool in their work, the way many scientists do already?”

**Contents**

This book presents a series of case studies related to the creation of humanities GIS models that blend tropes from literary, cultural, and historical studies. Reconceptualizing GIS by offering these types of ontological translations will hopefully foster epistemological
marriages between qualitative and quantitative (or mixed-method) approaches; provide a means to visualize literary interactions with place and space, as well as critical theory; and creatively engage technological applications relevant to the digital humanities. The models used essentially implement selected GIS applications from my PhD dissertation on the “lifeworlds,” or literary geographies, of 1930s Ireland and a GIS database-mapping project on seventeenth-century Irish land transfers as a postdoctoral fellow in the digital humanities. Using GIS in this new way, I discovered that I enjoyed the process of mapping and gained insight from the experience—which brings to mind the aphorism that it is the journey, not the destination, that counts. I hope this book will inspire readers to undertake their own journeys in humanities GIS as well.

Part 1, “GIS and the digital humanities,” continues with chapter 2, a brief history of Western geographical thought and post-structuralist theory in relation to the conceptualization of GIS approaches for the humanities. It ends with chapter 3, which presents a historical GIS case study of seventeenth-century Ireland that illustrates how three-dimensional (3D) geovisualization and database-mapping techniques helped me to analyze the redistribution of confiscated land following the 1641 Rebellion and Oliver Cromwell’s 1649–50 conquest of Ireland.

Part 2, “Writers, texts, and mapping,” focuses on GIS applications in literary and cultural studies. This section draws on the critical, aesthetic, and spatial thought of Mikhail Bakhtin, Walter Benjamin, Henri Lefebvre, Giambattista Vico, and the poet Dante. Chapter 4 draws on digital fieldwork to chronotopically plot the rural and urban landscapes experienced and perceived by the writer Patrick Kavanagh. This chapter chronicles how his relocation from the country to the city influenced the contrasting topophilic and topophobic depictions of his native Inniskeen Parish in his 1938 novel The Green Fool and 1942 epic poem The Great Hunger. Chapter 5 uses GIS to deformatively and ergodically reconstruct James Joyce’s Ulysses and illustrate how the spatial influence of the medieval Italian poet Dante, in the words of poet Ezra Pound, inspired Joyce to launch a “new Inferno in full sail.” Joyce employed cartographical and artistic methods of the Cubists and Italian Futurists (among others) to plot his masterwork, so this chapter considers what may have been further accomplished had he access to current GIS tools.

Through the prism of GIS, chapter 6 explores the psychogeographies of Flann O’Brien’s At Swim-Two-Birds (1939) and the historical cycles and poetics of Giambattista Vico and Mikhail Bakhtin to conduct Situationist International–inspired urban field surveys of modernist literature. Part 2 concludes with chapter 7, which discusses an open source–enabled GIS timeline created to perform an ergodic, digital bricolage that maps the writer Samuel Beckett’s early life in Dublin, London, and France between 1916 and 1945.

Part 3, “Toward a humanities GIS,” features chapter 8, which argues for rebooting GIS so that we may begin to engage the concepts and tools of the humanities. This book focuses largely on modeling GIS practices inspired by the humanities, which are currently pioneered by a coterie of scholars from across the academic spectrum and very much open to further exploration and development.
Sources

8. Ibid., 181.
10. Ibid., 142.
16. Ibid.
18. Ibid.
19. Ibid.