

Introduction

This book is an attempt to explore the nature of relationships between computation, literature, and philosophy. In it I will argue that similar principles underlie both contemporary literary analysis and computation. I will use this commonality to analyze a field of discursive production that has yet to find authoritative place in either world—videogames. My analysis will oscillate between theoretical and literary registers, leveraging a general literary-technology theory to motivate an analysis of particular videogames. This technique is not only applicable to software in general and videogames in particular, but also is useful in the analysis of traditional expressive artifacts such as poetry, literature, cinema, and art. My approach throughout this book is thus fundamentally a comparative one, and I have included examples from all of these fields as evidence for the usefulness and importance of a comparative procedural criticism. In particular, I will suggest that any medium—poetic, literary, cinematic, computational—can be read as a configurative system, an arrangement of discrete, interlocking units of expressive meaning. I call these general instances of procedural expression *unit operations*.

A practical marriage of literary theory and computation would not only give each field proper respect and attention from its counterpart, but also create a useful framework for the interrogation of cultural artifacts that straddle these fields. The humanists who define intellectual approaches to such texts must get serious about technology. Likewise, technologists ought to understand the precedents in critical theory, philosophy, and literature that trace, accompany, and inform the development of software technology. This book provides a

toolkit for both domains to bridge the chasm between them, and to serve as a model for future collaborative encounters, both analytical and practical.

Videogames rely on a foundation in the industrial arts. The hardware and software tools that underwrite the production of these and other works of digital art and software remain rooted in the moil of the marketplace. While most of the advances in information technology, from ENIAC to the Internet, were sparked in one way or another by government interests (and most frequently by the military), innumerable technical advances have taken place in the past forty years at the hands of industry.

The two advances of greatest interest to the present work are the introduction and adoption of *object technology* (OT) in software engineering, and the advent of complex adaptive systems theory in the natural, information, and computer sciences. OT provides a framework for developers to create units of programmatic meaning that can be reused in different ways and for different applications without requiring recompilation of the source elements. OT was first popularized as the SmallTalk programming language by Alan Kay at Xerox PARC's Learning Research Group some thirty-five years ago.¹ Since then, the entire software industry has adopted its core principles. Complex network theory proponents like Stephen Wolfram argue that the kinds of object- and relational-effects OT fabricates for software are built into natural systems like human society and the brain. These approaches to a wide variety of social and biological systems underscore the configurative aspects of a whole range of human processes.

I can think of few other fields with more varied demands on the qualifications of their practitioners than the humanities and informatics. And when I speak of these two fields, I do not mean just their seats of origin in the university. Rather, I reflect on these fields in all their varieties both inside and outside the academy. The humanities include film and theater, literature and art, music and dance, philosophy and criticism. Informatics touches computer science, biology and medicine, chemistry and ecology, cognitive science and psychology.

Each of these fields are overwhelmingly esoteric. They require a considerable amount of abstruse knowledge and experience to practice effectively. However, the humanities and informatics are afflicted not only by intellectual obscurity but also by professional mystery, perhaps because they are so deeply rooted in our daily lives. Anyone who has ever tried to write a screenplay or a Windows application can bear witness to how esotericism haunts the production of works in either field. Likewise, anyone who has not grown up playing videogames or

spent time in an academic department of the humanities can attest to the equal difficulty of orienting oneself in such specialized contexts.

Part of this difficulty has to do with the fields' propensity for jargon. Jonathan Culler, for example, says of literary theory: "A theory . . . can't be obvious."² For better or worse, this axiom has led to a wealth of highly specified, often obfuscated ways of talking about, creating, and critiquing human activity and production. In this way, the humanities are more like the industrial applications of informatics than they might think—or even wish—to be. Jargon and obfuscation is a way of laying groundwork for novel production. This was especially true in the twentieth century, which witnessed the transition from industrial capital to intellectual capital. Apart from aesthetes and professors, few readers of literature, viewers of film, or lovers of art could (or would want to) explain the aesthetic unity of New Criticism, or how the concepts of *aporia* or *pharmakon* help Deconstruction expose conflicting textual forces. At the same time, few Microsoft Word users could (or would want to) explain how the principles of polymorphism and inheritance make it possible for them to draw a chart with real-time data in a word processing document. If the move from real to intellectual property is what fueled the burgeoning technology industry of the past thirty years, then jargon is the raw material that helped industry forge that intellectual property.

The move from real property in the industrial era to intellectual property in the information era has much in common with the move from master–disciple institutionalized pedagogy to distributed pedagogy. Contemporary critical theory is much more like intellectual property, served with a zero-charge license for the production of criticism, than it is like doctrine handed down for repetition and mastery. For this reason, creators of literary theory or information technology approach their work with a different lilt; we create cogs rather than machines, bricks rather than houses, tacks rather than furniture. Works of literary criticism or technology are potential user guides, possible tools to incorporate into one's own critical and material products.

Videogames have their own jargon, as do videogame studies. I recognize that the reader may not be familiar with videogames, from either a popular or a critical perspective. *Ludology* is one way to address this need to explain what games are and how they work. From the Latin *ludus*, meaning game or sport, ludology addresses "games in general, and videogames in particular."³ Ludological approaches often take up theories of play and the history of games throughout human culture, including the work of Roger Callois, Johan Huizinga, Brian

Sutton-Smith, and Stewart Culin.⁴ Some critics have expanded the tenor of ludology, taking it to entail game studies in any sense of the word—including technical and cultural study. For the sake of precision, I will use the term in the narrower sense of the anthropological and especially formal study of games.

Ludology is an important part of videogame studies, and indeed situating videogames within the history of games and play is a worthwhile task. As a general practice, I am suspicious of the zeal with which the burgeoning field has relied on formalist approaches to its object of study, especially its approaches to ontology, typology, and classification. I discuss the state of the field in chapters 4, 5, and 12, but for now I wish primarily to encourage the use of criticism as a tool for understanding how videogames function as cultural artifacts, and how they do so along with other modes of human expression. I am specifically interested in the intersection between criticism and computation; in particular, I am concerned with videogames as a type of configurative or procedural artifact, one built up from units of tightly encapsulated meaning. As such, the present study does not try to situate itself generally within the history of games or the history of play. For this reason, I will avoid referring to ludology or “game studies” in the general sense, except to refer to those specific efforts to study games in the cultural context just described.

Despite my general concern for formalism, I do want to make one ontological clarification that I have found increasingly necessary, especially among humanists: the study of videogames is not necessarily a subfield of game theory, although the two are obliquely related.

Game theory is a field of mathematics used to study decision making in situations of conflict. Examples of game theory can be found in works as old as the Talmud and Sun Tzu’s *The Art of War*, but John von Neumann (whose contributions to computational theory I will cover in some detail) is generally agreed to have developed modern game theory in the 1940s. While theorizing the act of bluffing in poker, von Neumann began to recognize the profound implications of game theory for economics. He teamed up with economist Oskar Morgenstern to write *Theory of Games and Economic Behavior*.⁵ Initially, game theory concerned itself with the outcomes of strategic problems, like those in poker, war, and economics. Perhaps the best-known subject of game theory is the *prisoner’s dilemma*, a game in which two prisoners in isolation decide the fate of the other. According to the logic of the game, both prisoners benefit if they both cooperate, but if only one cooperates, only the other one benefits. The mathe-

matician John Nash, now well known thanks to the 2001 film about his life, added a set of influential approaches to cooperative games, including an approach known as *Nash equilibrium* that predicts outcomes based on each participant's preferences. Thus, the formal origin of game theory is as an analysis of parlor games like poker, and the "games" of game theory refer to abstract strategic structures.

When I speak of videogames, I refer to all the varieties of digital artifacts created and played on arcade machines, personal computers, and home consoles. Although videogames follow in the long tradition of parlor games, table games, pub games, and the many varieties of board games evolving from classic games like chess and Go, their necessary relation ends at this bit of common history. I am not concerned with a hard and fast definition of games in general. Instead, I would rather leave the work of building ontologies and typologies to the many capable theorists who are already undertaking such projects.⁶ When I speak of videogames, I am generally content to let the reader understand the term in its "loose and popular sense" (*pace* Chisholm).⁷

About This Book

This book is divided into four parts, corresponding to the areas of focus common to both literary theory and informatics over the last several decades. Each of these parts will introduce a major theme of videogame studies and perform videogame analysis using the tools forged in the theoretical analysis. Within each of these I will discuss a variety of works from philosophy, psychoanalysis, literature, film, software, and videogames.

In the first part, "From Systems to Units," I introduce the concept of *unit operations*, a general conceptual frame for discrete, compressed elements of fungible meaning. I advance a practice of criticism underwritten by unit operations, which I call *unit analysis*. Beginning with classical antiquity and working toward the microcomputer, I discuss the conceptual antecedents for unit operations (Plato, Aristotle, Leibniz, Spinoza, Badiou). I then trace the increasing compression of representation that has occurred in structuralism and poststructuralism, relating this compression to advances in computation such as John von Neumann's conditional control transfer. I examine the ontological strategies of major voices in psychoanalytic theory (Freud, Lacan, Žižek) and media theory (McLuhan, Kittler, Poster) as examples of unit operations that are constantly at risk of collapsing into systems. Then I introduce the history

of software architecture, discussing object technology as a practical unit-operational model for business systems. I use the four core principles of object technology to critique many of the popular academic works on digital media (Lev Manovich, George Landow, Jay Bolter) and genetics (Darwin, the Human Genome Project, Dawkins).

In the second part, “Procedural Criticism,” I argue for a comparative approach to videogame criticism that identifies and analyzes configurative expression in multiple media. I explore the software and narrative structures of game engines from *Pong* to *Half-Life*, showing how these texts function and interact through unit operations. Then I offer a perspective on current approaches to videogame studies, including a critique of the ongoing conflict between ludology and narratology (Aarseth, Frasca, Jenkins, Murray). I then offer a prolonged, comparative analysis of procedural expression in poetry, film, and games (Baude-laire, Bukowski, Jeunet, Wright).

In the third part, “Procedural Subjectivity,” I explore complex adaptive systems and elementary cellular automata as unit operations that transition between the material and representational worlds (Wolfram, Conway, Wright). I then explore the interaction between embedded representation and subjectivity, arguing that meaning in unit-operational systems arises in a place of crisis between configurative representation and subjectivity. Next I survey the relationship between play and the social power of art (Benjamin, Huizinga, Gadamer); I use this perspective to explore criticism’s ability to vault videogames toward a status higher than entertainment alone, focusing specifically on an analysis of *Star Wars Galaxies* as a social text. Finally, I discuss aspects of bias in games, offering a revised concept of simulation meant to facilitate future criticism (Turkle, Frasca, Crawford).

In the fourth part, “From Design to Configuration,” I put forward a sustained analysis of the field of Schizoanalysis (Deleuze and Guattari) in relation to complex network theory (Erdős, Milgram, Granovetter). Through Alain Badiou’s critique of Deleuze I explore the potential and limits of nomadism and complexity as expressions of unit operations. Working from these principles, I perform an extended analysis of freedom in large virtual spaces, including videogames and the modern novel (*Grand Theft Auto 3*, *The Legend of Zelda*, *Madame Bovary*, *Ulysses*). Finally, I offer a vision for the future of videogame criticism and research that models itself after the configurative approach to analysis I advance throughout.

Critical theory, informatics, and videogames are all highly specialized fields, whose practitioners when they write seriously tend to do so for one another rather than for outsiders. My intention is to produce an approach to criticism for procedural artifacts like videogames that can be put to use by humanists and technologists alike. To this end, I have tried to offer adequate explanation in addition to analysis when introducing complex topics in either field, without enervating its experts. I am hopeful and sincere about the future of real, tangible collaboration between these fields.