PART I

Art as a Complex Process

CHAPTER 1

A Nonlinear Affordance for Exploration

1.1 A Nonlinear and Self-similar Affordance for Exploration

Basically, a book is a linear and sequential kind of thing. The reader starts with page 1, then moves on to page 2, and so on until the last page. A reader reads a book to learn its contents, to gain an understanding of the book's message.

The present book can also be read in a nonlinear fashion: the reader can select a chapter or section of interest and then read back and forth depending on the opportunities, or "affordances," presented by that chapter or section. Affordances are the possibilities for further thought, reflection, or criticism offered by the ongoing reading process (maybe some of the sections of this book might even provide affordances for creating works of art). Although the chapters that I will briefly describe now appear in a necessarily fixed order, the possibility of browsing freely through them and picking up ideas that arouse curiosity and eventual disagreement will turn the sequential structure into a nonlinear and complex process that bears more than just accidental similarities to the making and experiencing of visual art.

The first part of this book is titled "Art as a Complex Process" and contains the following chapters.

In this first chapter, I present an advance organizer in the form of a point-by-point overview of the main messages and ideas of this book.

Chapter 2 begins with an overview of existing definitions of art and connects these definitions with philosophical ideas about the fundamental nature of reality – including the arts – in the form of ontologies or worldviews. It analyzes the properties of those ontologies in the context of the visual arts and concludes with the introduction of process ontology.

Chapter 3 begins with a brief explanation of the nature and properties of processes, which forms the basis for an explanation of the fundamentals of dynamical systems, followed by an explanation of complex systems, which

will be used as the framework for exploring the visual arts in this book. The concepts of complex dynamical systems will appear throughout the book, with illustrations from a wide range of phenomena giving concrete content to the theoretical concepts. This chapter can be used to introduce the chapters that follow or to retrospectively clarify concepts that appear later in the book.

Chapter 4 provides a definition of the visual arts viewed through the lens of complex dynamic systems.

Chapter 5 describes the functions of the visual arts as a web of interacting forces and influences that form the basis for their complexity and flexibility and the openness of their developmental, historical, and evolutionary changes.

The second part of the book is titled "Entangled Timescales of Visual Arts."

Chapter 6 explains the meaning of this title by focusing on an important feature of complex systems, namely that they consist of interacting processes on different timescales, from very short to very long. These processes are entangled, that is, they occur in continuous interaction and are interdependent. These entangled processes form the basis for important complexity features of the arts, such as self-organization, emergence, novelty, and creativity, attractors, critical states, variability, and so on.

Chapter 7 discusses the short-term timescale of artistic activity, which involves the creation as well as the experience of art, and shows how creating or experiencing a painting or an installation is a complex dynamic system, with typical complexity features.

Chapter 8 focuses on the timescale in which the short-term timescale of activity and experience is embedded, namely the creative artist's life course. It discusses artistic talent, art school and training, the artist's personality, motivations and drives for artistic creation, and artistic identities, all of which are complex phenomena.

Chapter 9 describes the timescale of the emergence of artistic excellence and celebrity, which involves processes that may be shorter or longer than the artist's life course and concern the changes in the cultural and artistic significance of a particular artist and work. The chapter shows how the emergence and distribution of excellence and celebrity, including artistic superstars, provides an illustration of the fundamental features of complex systems.

Chapter 10 focuses on the timescale of art history, which spans centuries or even millennia. It begins by showing how art historical processes can be interpreted in terms of complex dynamic systems. It then discusses

patterns of art historical change, from linear to stepwise to metastable change. The chapter addresses the question of continuity and discontinuity in art history from both quantitative and qualitative perspectives. Finally, it discusses how the concepts and methods of network theory can contribute to an understanding of the complex dynamics of art worlds.

Chapter 11 deals with the timescale of history and human evolution. It offers a complexity approach to the evolution of art that goes beyond simplistic theories of the survival function of art, including the much-debated issue of the function of art in the context of sexual selection. After discussing how both evolution and human activity are entangled, interaction-dominant dynamics, the chapter outlines different evolutionary scenarios: the survival-enhancing function and the view of art as an evolutionary by-product. It then offers a complexity-based alternative.

In the third part of the book, "Understanding Art Through Dynamic Models," I argue that seemingly simplistic simulation models based on fundamental notions of dynamic systems and complexity can nevertheless function as tools for understanding typical phenomena in the dynamics of art.

Chapter 12 presents a model of the dynamics of cultural and market value that helps explain why contemporary artworlds lead to the emergence of cultural and art market superstars, and why the vast majority of artists face considerable disparities in making a living from their art.

Chapter 13 presents a dynamic model of the emergence of artistic excellence and the nonlinear trajectory of artistic careers. The model is based on the interaction-dominant dynamics of a neutral generative network, with positive and negative feedback loops. The model generates time-series descriptions of idiosyncratic (person-specific) artistic careers. The distributions of these simulated careers follow asymmetric, power law distributions, similar to the empirical data. The simulated life course patterns with the empirical data turn out to be qualitatively similar to empirical data on the life courses of French and American artists.

Chapter 14 presents a dynamic model of long-term, art historical trends and shows the complexity of overlapping styles and movements. It is based on a modification of a dynamic model of development on the timescale of the human life course. The basic evolution rules are those of simultaneously operating processes of consolidation of the status quo and processes of innovation driven by a familiarity–novelty optimum. The simulation explores different scenarios, one of which generates the typical art historical pattern of overlapping continuous as well as discontinuous processes.

1.2 An Advance Organizer: The Book in a Nutshell

1. Reality, including art, must be understood from a *process ontology*[1]
   a. Processes are the building blocks of reality.
   b. The world consists of interconnected processes.
   c. "Things[2]" are interconnected processes.
   d. A process is a temporal sequence of interconnected occurrences or events, forming a temporal pattern.
2. Art[3] is a *process* on all its possible levels of description.
   a. A work of art is a process.
   b. Creating a work of art is a process.
   c. Interpreting, experiencing, or theorizing about art, works of art, and artists are processes.
   d. Conserving, curating, displaying, trading, buying works of art are processes.
3. Art processes take place on various *timescales.*
   a. Timescales range from micro- to macro-levels, for instance from (milli-)seconds of artistic activities and experiences to centuries of art-historical development.
   b. Different timescales are characterized by different dynamics (types of processes).
   c. Those distinctions are gradual and fuzzy.
4. Art processes occur on various *levels of organization.*
   a. Levels of organization are connected with timescales.
   b. They form hierarchies of embedded levels.
   c. Examples are the level of micro-activities of creating an artwork, embedded in the lifespan of a particular artist, embedded in a network of interacting artists working along the same artistic principles (schools, styles, or movements), embedded in artworlds as networks of artists, appreciators, curators and traders, embedded in visual culture as a network of social, material interactions, embedded in human societies and cultures in general.
5. Timescales and layers/levels of organization are *dynamically intertwined* (or *entangled*).
   a. Lower-level processes (e.g., creating a work of art) have an effect on higher-level processes (e.g., evolution of a particular art style over decades); these are bottom–up dynamic relationships.

[1] See Section 2.3, for an explanation of the concept ontology.
[2] An example of a "thing" is a work of art, but also an artist, or an art movement, or an art market.
[3] I use the word "art" to refer to the visual arts.

   b. Higher-level processes have an effect on lower-level processes; these are top–down relationships.
   c. There are various types of such effects: they can be affording, enabling, invitational, constraining, causal, conditional, etc.
   d. Bottom–up and top–down dynamic relationships are dynamically connected; they are enabling or constructing each other (e.g., the activities of creating a painting result in the emergence of a visual form, which is the painting-in-progress; the latter enables and constrains the activities of painting).

6. Manifold, intertwined processes form *complex dynamic systems*, which have the following properties:
   a. They are *recursive* (components of a complex dynamic system are complex dynamic systems).
   b. They are interest-related and observer-dependent, that is, they are *perspectival* (what counts as a system or what counts as a component of the system depends on an observer's deliberately chosen perspective or interest).
   c. *They define processes* as time-dependent, iterative sequences or flows, based on rules, constraints, or adjacent potentials that make one state of the process change into the next state of the process over the course of time.
   d. They define processes in a *state space*, that is, a space of possible dimensions of variation; state spaces of art depend on culturally, politically, economically defined conditions (e.g., Western art vs classic Islamic art, Asian art, etc.).
   e. State spaces reflect ontologies (e.g., they are ways of answering the question "what is art"), and, being ontologies, they are *enacted* in the form of a *praxis* (a coherent and self-sustaining way of doing things).
7. Complex dynamic systems are characterized by processes that *self-organize* and generate *emergent properties.*
   a. Self-organization means that patterns, structure, stability, and change arise spontaneously from the interactions of all the processes involved, and are not the result of a controller, plan, or design.
   b. Emergent properties are properties that
      i. cannot be reduced to some sort of addition of properties of the components;
      ii. are often unpredictable and surprising, which makes them signposts of novelty and creativity that are direct

consequences of how complex dynamic systems work on all their levels of organization and timescales;
iii. condition, constrain, and enable the underlying processes on which they, on their turn, depend; they exert cyclical conditionality (cyclical causality).

8. *Art is a complex dynamic system*: it is self-organizing and generating emergent properties.
9. As a self-organizing system of processes, art is characterized by *the basic features of self-organization* on all its timescales and levels of organization:
   a. It is relatively autonomous, yet interacting with its embedding systems and constantly reproduces the conditions and forces that guard and reproduce its (relative) autonomy.
   b. Its features are the direct result of its own dynamics, which assimilate as well as influence external influences such as historical, cultural, or technological changes.
   c. It is a dynamic mixture of temporal stability and variability.
   d. It shows periods of stability that are self-maintaining and self-reproducing networks of processes that correspond with the attractor states of the system.
   e. In terms of stability, attractor states can be stable, multi-stable, metastable, or critical.
   f. It shows periods of continuous as well as discontinuous (rapid, unexpected) change that result from the underlying dynamics of the art system (from the micro-scale of creating a work of art to the macro-scale of an artworld) and of its interactions with the embedding systems.
   g. It shows self-organized criticality: parts of the art system self-organize into states where any insignificant event can result in unpredictable changes that can range from very small to very large (e.g., from minor variations in style to revolutionary shifts in the nature of art itself).
   h. The typical distribution of events, of artistic revolutions up to minor stylistic variations, of fame and stardom, of financial, cultural, and philosophical value, is asymmetric and "heavy-tailed" (it complies with a power law distribution).
10. *Art corresponds with emergent properties* on all its levels of organization and timescales.
    a. A work of art is an emergent property of its underlying processes of creation (e.g., activities of painting, activities of designing and producing an installation).

b. The appreciation or experience of a work of art is an emergent property of the psychological and bodily processes involved in perceiving and interpreting a work of art in a specific context (e.g., a museum).
c. An artistic career (the artistic lifespan of a particular artist) is an emergent property of sequences of events that constitute a particular artistic lifespan; these events form an iterative sequence of artworks produced, failures and successes, interactions with other artists, appreciators and buyers, etc.
d. Schools, movements, styles, etc. are emergent properties of networks of art-related long-term processes, applying to artists, appreciators, critics, curators, dealers, buyers, . . .
e. Artworlds are emergent properties of all art-related processes, on all layers of organization and timescales.
f. Emergent properties depend on the underlying processes out of which they originated; underlying processes depend on the emergent properties to which they gave rise (see principle 5).
g. Self-organization and emergence form the basis of typical features of art such as artistic creativity, interpretation, and experience of art, history-dependent normativity, and value; art styles and movements, art historical continuities and discontinuities, stardom and power law distributions of artistic fame and commercial value.
h. all emergent properties exhibit cyclical causality (bottom–up and top–down, see principle 7.b.iii).

11. Typical features of art, namely *creativity, tradition, and novelty are the expression of*
    a. the processes of self-organization and emergence that occur in all complex systems, including the art system, on all its levels of organization and all its timescales;
    b. an intrinsically creative universe: the notion of creativity is considerably broader than the psychological notion of "creative person" or "creative artist."
12. The art system is a *fragmented praxis of embodied, enacting, embedded, and extended practices.*
    a. It is an open, history-dependent, self-maintaining network of interacting practices carried out by a community of agents.
    b. Practices include practices of production and creation of objects, events, and organizational patterns, practices of communication, practices of justification, and practices of valorization, patterns

of discourse, physical tools, and spaces, and all the resources that are needed to sustain those practices (financial, technological, . . .).

c. All art practices are *embodied*, that is materially and spatiotemporally instantiated in the activity of a real agent (e.g., an artist, a buyer, . . .).
d. All art practices *enact* ontologies, values, and norms.
e. All art practices are *embedded* in other practices (e.g., the overarching art praxis).
f. All art practices are *extended*; for example, an art practice such as the creation of a work of art is distributed among different actors: the artist, the artistic medium, the (potential) viewers, etc.

13. The identity of art (the answer to the question "What is art?")
    a. is processual
        i. Art is a process and hence escapes definitions focusing on entity aspects such as essential form, essential function, essential material existence;
        ii. This processual identity is *relational*: it has a relational identity in the form of a dynamic network of changing relationships between its components (persons, objects, spaces, material means, . . .).
        iii. It operates on the critical boundary between a typical autopoietic (self-producing and closed) system and an open network.
    b. is complex
        i. Art has multiple, superposed identities.
        ii. Art is emergent and self-organizing and characterized by *becoming* rather than *being*.

CHAPTER 2

Art and Process
Definitions and Ontologies

2.1 What Is Art?

"The art question is the question 'what is art?'"[1] It is (or should I say *was*?) probably *the* fundamental question of art theory or philosophy of art.[2] Most scholars who have asked this question have done so in the context of relatively recent, Western art. Rich, complex art worlds, such as Islamic art,[3] played a minor role in their considerations. Nevertheless, I will follow this lopsided interest and focus on Western visual arts as a case study to illustrate my main point that art should be understood in terms of process and complexity.

"What is art?" is a question of the definition of art, and *definition* means to specify the properties that are necessary and sufficient for something to be art.[4] It is a question asked not only by art theorists but also by a public that looks at particular works of art that are, at least initially, incomprehensible to them or that they find repulsive, or that contradict what a particular viewer expects from art. A viewer might ask "Is this art?" when confronted with *Immersion*, aka the *Piss Christ* photograph made in 1987 by Andres Serrano.[5] A viewer might ask "But is this art?" when seeing *Can 004 Künstlerscheisse – Artist's Shit – Merde d'Artiste – Merda d'Artista*, which contains 30 grams of the Italian artist Piero Manzoni's excrements, produced and canned in May 1961 and on display in various prestigious museums (Tate Modern, MoMa New York, among others). Is it canned shit, or is it important art because, it is "... the perfect metaphor for the bodied and disembodied nature of artistic labor: the work of art as fully incorporated raw material, and its violent expulsion as

[1] Warburton, 2003, p. 1.
[2] Adajian, 2022; Carroll, 2000; Danto, 2013; Davies, 1991, 2015; Dickie, 1969; Freeland, 2001; Smith, 2009; Stecker, 1998; Warburton, 2003.
[3] Öztürk, Gazi & Bowker, 2022.
[4] Davies, 2007.
[5] This is the paradigmatic example used by Freeland (2001).