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DIGITAL ART

AND

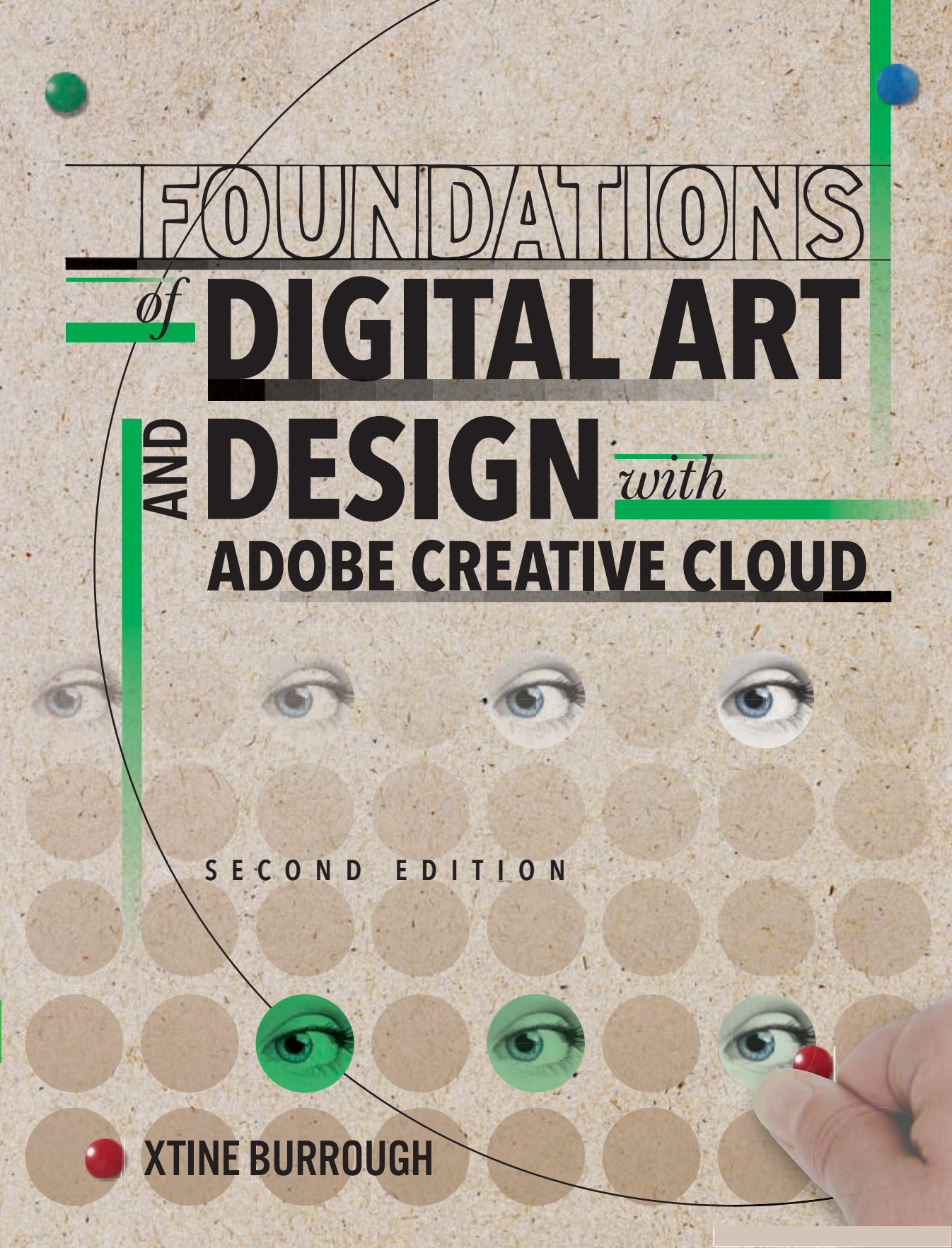
DESIGN

*with*

ADOBE CREATIVE CLOUD

SECOND EDITION

XTINE BURROUGH





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**FOUNDATIONS OF DIGITAL ART AND DESIGN WITH ADOBE® CREATIVE CLOUD, 2nd Edition**  
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ScoutAutomatedPrintCode

*For Parker and Martin, and art and design students*



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This book includes a lot of images of art works that could have resulted in a great amount of permissions expenses. Nearly all of the images in the text were donated. Dear artist and designer contributors, I am forever grateful for your willingness to have your works included here. Thank you, thank you.

Finally, I have much gratitude for the ongoing support that my friends and family provide: Laurie Cella, Emily Erickson, Sam Martin and Paco Aragon—and Tate and Niles, Lucy HG Solomon and Matt Solomon—and Birdie and Rosie, Sabrina Starnaman, and my mom and dad. Paul Lester, Martin Lester, and Parker Lester, you continue to teach me in the UU tradition, with open minds, loving hearts, and helping hands. Thank you.

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**BONUS CHAPTERS AVAILABLE IN DIGITAL BOOKS AND ONLINE FROM  
WWW.DIGITALART-DESIGN.COM OR PEACHPIT.COM**

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# INTRODUCTION

## WHAT ARE THE FOUNDATIONS OF DIGITAL ART AND DESIGN?

In the School of Arts, Technology, and Emerging Communication (ATEC) at UT Dallas, where I am teaching now, students encounter this book during their first year of coursework. However, knowing the origin story of this book is useful for understanding how I came to think about foundations materials for digital art and design students who might be completing coursework in various types of schools or programs, such as art, communication, design, digital humanities, media studies, and so on.

I originally designed this book before arriving at UT Dallas, when most of my students had little time in their schedules for classes that would heighten their understanding of visual communication: foundations of two-dimensional design, typography, drawing, and so on. Instead, they enrolled in a large historical survey course and some took an elective “skills” course, in which they learned some Adobe applications. Mastery doesn’t happen in a mere sixteen weeks. At best, the skills course created awareness of the concepts and techniques that someone entering the creative professional industries should master.

First developed to serve these students, this book is now used by readers and educators in two-year and four-year fine arts and applied arts programs, college-level communications and media departments, and in some U.S. high schools. Knowing the breadth of my audience, the aim of this book is to offer the most information at the confluence of design (principles, histories, and theories), Adobe software, and examples of digital art for readers, educators, and practitioners with varied interests. My goal is to be thorough enough for university students and clear enough for high school students.

The majority of my students are interested in practicing the exercises and mastering the software, because they’re anxious to jump in and create. Educators are interested in teaching art and design, because they’re passionate not about software, but about media art, graphic design, animation, games, digital video, emerging forms of digital expression, and so on.

My approach to mediating this clash of interests is to write about and show as many ideas and examples of art and design history and principles as I can while demonstrating the use of the tools. For example, instead of showing students how to remove red-eye from a photograph (there are loads of videos on YouTube for such a specific endeavor), I demonstrate making a conscious



design choice in regard to scale, proximity, the rule of thirds, or other principles while using Adobe's tools. I've tried to keep the exercises short, while also showing the fundamental tools in many of the Adobe programs. Most of the tools have changed very little since the first time I used Photoshop in 1992 (with the major exception of the development of layers in 1994, but I digress).

In ATEC, students attend a lecture, traditional studio, and computer lab. So this course (and this book) merges a traditional course in two-dimensional design with foundations of digital art and design practices. I start in Section 1, *Bits, Pixels, Vectors, and Design*, with material that's been presented by the authors and artists on whose shoulders I'm crouching: Donis A. Dondis (*A Primer of Visual Literacy*), Johannes Itten (*Design and Form: The Basic Course at the Bauhaus and Later*), David A. Lauer and Stephen Pentak (*Design Basics*), Wucius Wong (*Principles of Form and Design*), and others. It is this understanding of the language of design that I consider foundational. I also include examples of each principle or basic element drawn from contemporary works of digital art. Although this book may be assigned in a graphic design program, it's often read within the broader context of digital art. I have had many roles as an educator, from an education advisor on the AIGA Orange County board to a co-author of a trilogy of collections on remix studies—my personal identity as a digital artist is also part of this equation.

Two-dimensional design is followed by Section 2, *Digital Photography*. In the classroom, I find it easier to present basic vector graphics before introducing the pixel-loaded arena of digital imaging—Adobe Illustrator is often a much more forgiving application than Adobe Photoshop due to the insignificance of file resolution at such a basic level. In this text, photography is primarily considered to be another vehicle through which the basic elements of design can be understood. In our program, students use this portion of the text to learn to organize files, compose in a photographic frame, and understand color relationships.

Because photo manipulation is nearly as old as the medium itself, the natural follow-up to photography is Section 3, *Digital Manipulation and ~~Free~~ Fair Use*—where better to talk about contrast through juxtaposition? Collage and photomontage are historical legacies of the digital operations: cut, copy, and paste. While discussing these, I also bring forth contemporary strategies for sampling and licensing with copy-left or Creative Commons licenses in this section.

Section 4, *Typography*, teaches students to honor and manipulate type. This is essential, as most visual communication comprises type and image, and occasionally time. I studied photography in my undergraduate days at the Art

Institute of Boston; typography is an art that I learned during my professional life as a web designer in the 1990s and since then as a professor. It helped that I lived with one of the best typographic educators in Southern California in the early 2000s. I've talked with many educators who are strong in one area—photography, typography, web design, or something else—but feel a deficit in another. As such, I provide resources for additional materials throughout the book, both for students and educators who might be using this text in a classroom.

The *Coda*, at the end of the book, explains the important concept of revision. A student may assume that she has an experiential understanding of design principles after simply following the steps in a software application. Students and readers must remember, however, that reading a book on learning to play the guitar or manipulate imagery, is not the same as mastering the instrument or software. Practice, and of course revision, is the best way to learn the craft and become more efficient. I've included revision stories from artists and design professionals alike.

In addition, you'll find one bonus section online or in the electronic version of this book:

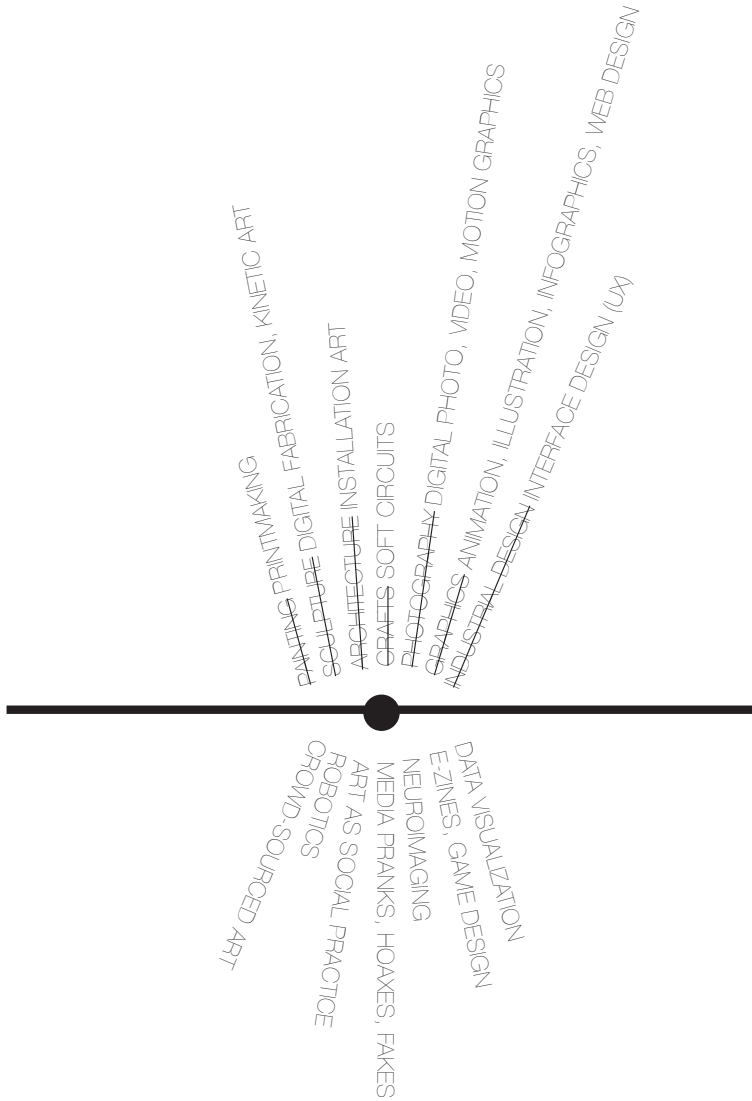
Automation is key to working efficiently, so one chapter in Section 5, *Effective Work Habits*, (available online or in the eBook) is dedicated to it. The other chapter addresses the question, “How do you suggest I make a portfolio I can send someone?” There's no one perfect answer, as each student has different talents and different needs. But learning pagination in Adobe InDesign can help students who want to create their own books—a handy skill for soon-to-be graduates or those applying for internships.

Lastly, I would like to offer an update of Dondis's scale that registers the differences (or similarities) among specific artistic media on a continuum of “fine” and “applied” art in FIGURE I.1. To demonstrate that the Bauhaus “would group any and all of the fine and applied arts on one central point in the continuum” [1], Dondis placed the media of the time grouped around a central point on the horizontal axis (FIGURE I.1).

All forms of visual message-making are influenced and analyzed by an understanding of the basic elements of design, on the screen, in print, as a hologram, or however else they may come to us on future platforms. Whether you intend to be a web designer, a social media entrepreneur, a digital installation artist, or a game developer, the design foundations offered in this book, coupled with the exercises in each of the software applications, will help you achieve your goals.

**REFERENCE [1]** Donis A. Dondis, *Primer of Visual Literacy* (Cambridge, MA: MIT Press, 1973). 4.

**FIGURE I.1** Donis A. Dondis developed the original illustration in reference to the perceived intellectual divide between the two purposes, outcomes, or beliefs about art making. (The image is essentially the same, where the labels would have been the text appears here with a strike through it.)



Because all students or readers will have different hardware, software, and needs, you'll learn to use this book in the most fitting way for your setup in the following exercises.

EXERCISE  
1

## OPERATING SYSTEMS

When the Mac was released in 1984, it included a graphical user interface and a mouse, two visual user-oriented components that were missing from other personal computers (FIGURE 1.2). Artists and designers developed a strong loyalty to Apple over time as their needs and concerns were often met first on the Apple platform. For a while, there was no question about which platform was best suited to making art on the computer: Mac. Universities now have Mac and Windows labs dedicated to art and design programs. In some creative industries, such as graphic design or digital photography, Mac (now rebranded macOS) is still the standard platform. However, web designers, game developers, and animators often work on the Windows platform.

It does not matter if you use a macOS or Windows. Your files will transfer easily from one operating system to the other. (Be sure to include the file extensions in the name of your file—something you’ll learn more about in Chapter 1, *The Dot, the Path, and the Pixel*). If you’re creating multimedia art or designs, you’ll want to view the work on both platforms. However, this should not dictate where you conceive and develop the project.

I’ve written this book using macOS. The screenshots were made on my MacBook Pro. However, every keyboard shortcut is provided in both macOS and Windows versions. For instance, the File > Copy command shortcut is listed throughout the book as **Command-C/Ctrl-C**.

That’s it. The rest is more or less the same.

EXERCISE  
2

## DOWNLOADING WORK FILES, BONUS CHAPTERS, AND VIEWING SCREENCASTS

Some of the exercises in this book will require you to download a work file or a set of files before you begin. Readers who buy the print edition of the book will also want to download the bonus section on *Effective Work Habits*. All of the files are on the companion websites for the book at [www.digitalart-design.com](http://www.digitalart-design.com) (FIGURE 1.3) and at [peachpit.com](http://peachpit.com) for registered users (see “Accessing the online content at [peachpit.com](http://peachpit.com)” later in this chapter). I’ve also posted a link to the work files on my personal website ([www.missconceptions.net](http://www.missconceptions.net)), and there’s a Facebook page for *Foundations of Digital Art and Design* where I post updates and answer reader questions [2].



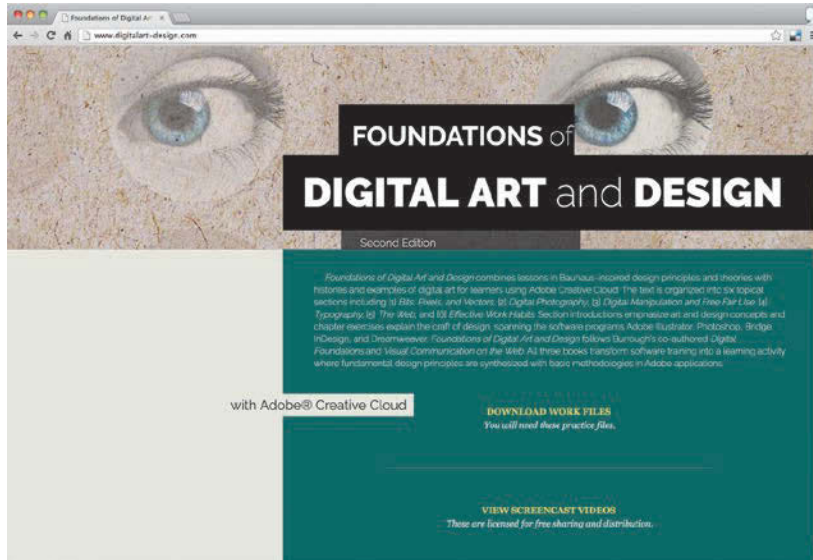
FIGURE 1.2 The first Mac computer sold commercially in 1984. It included a mouse and a graphical user interface instead of the ever-intimidating command line.

REFERENCE [2]

[facebook.com/  
FoundationsOfDigital  
ArtAndDesign](https://facebook.com/FoundationsOfDigitalArtAndDesign)



FIGURE I.3 A screenshot of the companion website, [www.digitalart-design.com](http://www.digitalart-design.com). You can download any necessary work files from this site before beginning to work on the exercises in the chapters.



**REFERENCE [3]**

[bit.ly/video-demos](http://bit.ly/video-demos) or  
[bit.ly/foundations-demos](http://bit.ly/foundations-demos)

**REFERENCE [4]**

[bit.ly/youtube-demos](http://bit.ly/youtube-demos)

Most chapters include a screencast in which I have demonstrated my process for some part of the chapter's exercises. These offer me an opportunity to show a portion of the exercise that is better demonstrated in a live presentation than captured in images and text. They are also an archive of tutorial files that my students and I rely on for use outside of the classroom. These are accessible from the companion website. The screencasts for this second edition of the book are published on Vimeo [3]. The screencasts for the first edition of the book are preserved on YouTube [4].

## ACCESSING THE ONLINE CONTENT AT PEACHPIT.COM

1. Go to [www.peachpit.com/register](http://www.peachpit.com/register).
2. Sign in or create a new account.
3. Enter the ISBN: **9780135732359**, and click Submit.

The lesson files can be accessed through the Registered Products tab on your Account page. Click the Access Bonus Content link below the title of your product to proceed to the download page. Click the lesson file links to download them to your computer.



## THIRD-PARTY IMAGES

Many of the images in this book were donated by artists and designers. Some were available for me to use in a commercial publication because the copyright had expired or because the work was part of a government archive, which usually puts it into the public domain. To those who donated: *Thank you!*

You'll learn more about public domain, the copyleft movement and creative licensing techniques in the introduction to Section 3, *Digital Manipulation and ~~Free~~ Fair Use*.

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FIGURE S1.1 Documentation of Leo Villareal's light installation *Multiverse*, 2008. You can watch Villareal talk about the programming for this piece at <https://youtu.be/ygIKBc9gaUQ>.



## SECTION 1

# BITS, PIXELS, VECTORS, AND DESIGN

**IN 1995**, Nicholas Negroponte wrote *Being Digital*, a book that would become a classic among digital art, media, and lifestyle enthusiasts. While resurrecting a text as seemingly outdated as Negroponte’s digital hit may seem like the equivalent of starting this book with pictures of cave drawings, reflecting on the work from a vantage point of more than 20 years reveals Negroponte to be a true visionary. He wrote the manuscript long before streaming entertainment, social media, mobile technologies, and other common digital phenomena. Yet his predictions included developments similar to Apple’s virtual assistant Siri, holographic imaging like that found in augmented reality, “high touch computing” in which touch-pad interfaces were once considered the “dark horse in graphic input” [1], videocassette rental stores going out of business by 2010, streaming video on the web (YouTube, Vimeo, Netflix, Hulu, and others), the end of getting lost thanks to what we commonly refer to as GPS (global positioning systems), and more.

**REFERENCE [1]** Nicholas Negroponte, *Being Digital* (New York: Vintage, 1996), 131.

**REFERENCE [2]** Negroponte, 229.

Being digital, Negroponte wrote, “has four very powerful qualities that will result in its ultimate triumph: decentralizing, globalizing, harmonizing, and empowering” [2]. These qualities are present in many of the works of art and design presented in this book. We’ll investigate the decentralized nature of the Internet in Section 5, *The Web*, and the globalized economy and automated processes inherent to digital applications in Section 6, *Effective Work Habits*. You’ll learn about harmony as a design strategy, but see it applied in many examples that utilize social media or require participation. Completing the exercises in this book will give you the knowledge of digital tools necessary to communicate effectively in a networked mediascape.

Digital technologies let us participate in realities beyond the physical world: virtual reality, augmented reality, screen spaces such as video games and the Internet, and so on. However, our understanding of these digital spaces is predicated on human perception, which is, in turn, guided by visual cues. While a digital artist might create media to develop an augmented reality educational game such as *Oyster City* (FIGURES S1.2 AND S1.3), a graphic designer might create media to communicate a concept in the physical world. Both artists and designers rely on their knowledge of human perception to develop effective visual messages.

**REFERENCE [3]** Negroponte, 105.

Visual images created on a computer are developed either as a sampled set of pixels or as vector coordinates. The pixel, developed at Xerox’s PARC in the mid-1960s, was initially “a shape-oriented approach to computer graphics in which amorphous areas were handled and textured by storing and displaying images as a massive collection of dots” [3].



FIGURE S1.2 Title slide and overview of sites in *Oyster City*, an augmented reality game and walking tour by Meredith Drum, Rachel Stevens, and Phoenix Toews (oystercity.org).

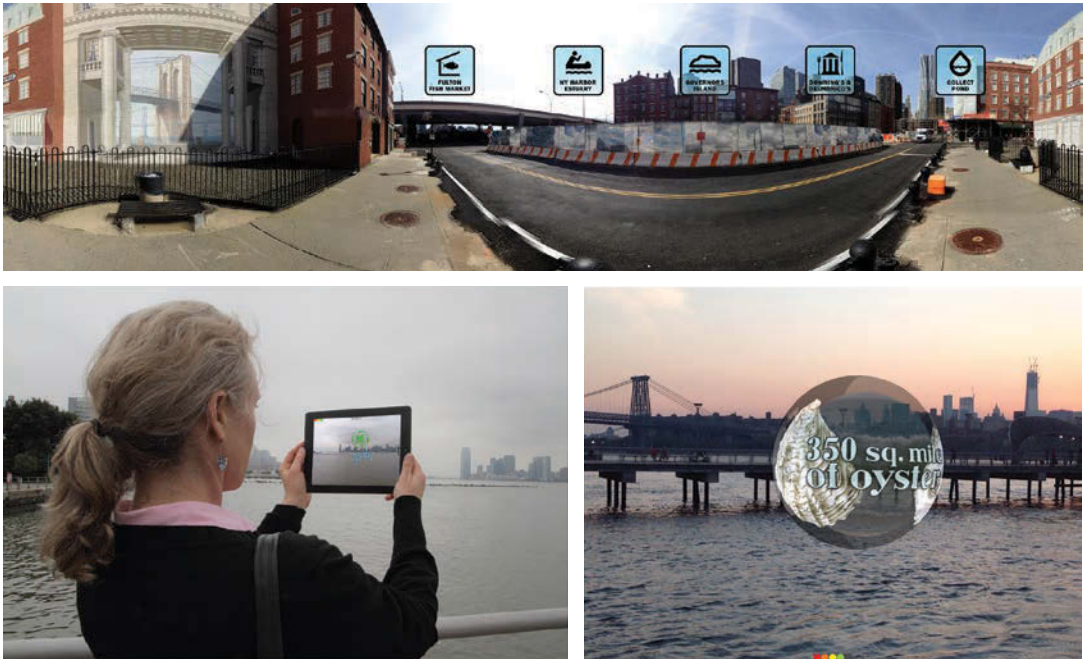


FIGURE S1.3 Panoramic view (top), East River view (lower left), and user interaction (lower right) in *Oyster City*.

The dot is the most primary visual element. It is the simplest way to point to the existence of something. A dot is either present or not. Place a single black dot in a field of white, and you'll be quick to judge which is the figure (or the positive space) and which is the ground (or the negative space), as in Leo Villareal's light installations (see FIGURE S1.1 at the beginning of this section). It's no wonder that the dot was the go-to method of image creation in the earliest computer graphics. In the Huffington Post, Villareal wrote, "I am interested in lowest common denominators such as pixels or the zeros and ones in binary code" [4].

Coincidentally, the dot has been used as a primary method of mark making throughout the history of art. Leo Villareal's digital work references pointillism seen in neoimpressionist paintings of the 1880s by Georges Seurat, Paul Signac, and others (FIGURE S1.4). The digital halftone also makes use of the illusory effects of placing small dots of color near enough to one another to express a photorealistic image.

**REFERENCE [4]** See [www.huffingtonpost.com/leo-villareal/the-essence-of-light-thir\\_b\\_720351.html#141416](http://www.huffingtonpost.com/leo-villareal/the-essence-of-light-thir_b_720351.html#141416)

Listen to (or read) "One Dot at a Time, Lichtenstein Made Art Pop," Susan Stamberg's excellent review of Roy Lichtenstein's retrospective at the National Gallery of Art in Washington, DC, on NPR.org ([www.npr.org/2012/10/15/162807890/one-dot-at-a-time-lichtenstein-made-art-pop](http://www.npr.org/2012/10/15/162807890/one-dot-at-a-time-lichtenstein-made-art-pop)).

**FIGURE S1.4** George Seurat's *Parade de cirque, or Circus Sideshow* (1887–88) demonstrates the painter's pointillist technique. Seurat created the work by dabbing tightly spaced dots onto the canvas. Bequest of Stephen C. Clark, 1960, Metropolitan Museum of Art, The Met Collection Open Access Artworks, Accession Number 61.101.17.



**REFERENCE [5]** Sketchpad is discussed in Negroponte's book on page 103. To see a demonstration of Sketchpad, visit [youtu.be/57wj8diYpgY](https://youtu.be/57wj8diYpgY)

In 1963, before the invention of the pixel, Ivan Sutherland developed Sketchpad [5]. Users could draw lines with a “light pen,” but the challenge of real-time computation and photorealistic rendering hindered Sutherland and other programmers from further developing his concept. The pixel (a term derived from the words *picture* and *element*) is to Sketchpad what the dot is to the line. Why compute an entire line when two dots could be used to establish its starting and ending points?

In the exercises for Chapter 2, you'll learn to “see” the lines in a photograph. You'll trace the lines in the image to convert a detailed, photographic picture into a line drawing with a similar composition.

Of course, lines have visual qualities in addition to a beginning and an end. A line has a defined weight or thickness (also called a *stroke* in Adobe applications). It may be drawn tightly (a perfectly straight line, achieved in Adobe applications by holding the Shift key as you draw) or loosely and expressively to suggest a hand-drawn artifact.

A basic unit of computing is a bit, or as Negroponte refers to it, “the smallest atomic element in the DNA of information. It is the state of being: on or off, true or false, up or down, in or out, black or white.” Bits combine together to form a signal (visual, auditory, tactile, and so on). In the realm of design, lines are often viewed as contoured edges that surround shapes. An infinite number of forms can be made by combining any or all of the three basic shapes: the circle, the square, and the triangle. These shapes can be understood, to use Negroponte's metaphor, as the smallest element in the DNA of image construction [6].

**REFERENCE [6]**  
Negroponte, 14.

## DRAWING, LITERALLY, WITH A MOUSE

Joseph DeLappe's *The Artist's Mouse* (FIGURE S1.5) cleverly—and literally—traces mouse movements while “the artist” uses the contraption. DeLappe’s project is an analog response to one of the earliest digital interface challenges: how to track the cursor’s position on the screen.



FIGURE S1.5 *The Artist's Mouse* (1998) by Joseph DeLappe.

By completing the exercises in Chapter 3, you'll learn to combine the basic shapes—the circle, the triangle, and the square—into complex icons. This activity provides a lesson in design and abstraction, as well as a way to understand computing processes. When simple elements are combined, the new combination can be exponentially more complex.

In the first three chapters of this book, you'll work with the foundational elements of design—the dot, the line, and the three basic shapes—and you'll be encouraged to think about the relationship between these design elements and computing technologies. The dot is analogous to the bit, the vector line is created in Adobe Illustrator as a path between two dots, and basic shapes can be combined to form an infinite number of complex forms. Negroponte understood that “computing is not about computers anymore. It is about living” [7]. Artists and designers are essentially developers of the way we live—somewhere between the analog and virtual worlds—and the way we create meaning for such a visual landscape.

**REFERENCE [7]**  
Negroponte, 6.

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## CHAPTER 1

# THE DOT, THE PATH, AND THE PIXEL

**THE EXERCISES IN** this chapter show you how to create and manipulate dots and make meaning with basic design elements. Remember the observation we made in the introduction: When you place a single black dot in a field of white, you can quickly judge which is the figure (or the positive space) and which is the ground (or the negative space). A group of same-shaped circles creates a repeated pattern of dots. You read this pattern as one giant shape that dominates the composition. The pattern of black dots that you create becomes the foreground, while the white space is understood as the background (FIGURE 1.1).

The division between the foreground and background, or the *figure* and *ground*, is a visual tool that can be used to manipulate a viewer's perception. When it's difficult to distinguish between the figure and the ground, a viewer may have trouble deciphering the message. Messages may imply unintended meanings due to an unexpected shift of the figure and ground. Gestalt psychology, which studies human perception, has provided artists and designers with a set of laws and properties that are incredibly useful for predicting how a viewer