

The Theory and Practice of

MOTION DESIGN

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M T N E S

Critical Perspectives and
Professional Practice

EDITED BY

R. Brian Stone
& Leah Wahlin

A **Focal Press** Book



The Theory and Practice of Motion Design
Critical Perspectives and
Professional Practice



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The Theory and Practice of Motion Design ***Critical Perspectives and*** ***Professional Practice***

Edited by
R. Brian Stone & Leah Wahlin

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Author Notes & Acknowledgements

The Department of Design resides in one of the oldest and grandest buildings on the campus of The Ohio State University. An inscription over the doors of Hayes Hall reads, “The Cultured Mind The Skillful Hand” and serves as a reminder of the human-centered nature of design. It speaks to the pairing of concept and execution at the heart of effective, compelling, and creative communication. It also places into perspective the need for balance. The education of motion designers as well as the practice of motion design require balance. The full potential of the time-based narratives described in this collection is only fully realized by masterful execution.

As editors and collaborators, we have benefited from the balance of our similarities and offsetting differences. We are educators situated in both academia and professional practice in our own careers. Given his grounding in design, Brian’s voice and experience are explicitly represented in the “Introduction” and “Notes from the Classroom,” but Leah has shaped the narrative of those chapters and the project as a whole, approaching the work from her background in technical communication and rhetoric.

The Cultured Mind The Skillful Hand also tells us that design is crafted by people for people. Without the assistance, guidance, critique, and support of so many, this project would not have been made possible. Special thanks go out to Dave Bull, Jessica McManus, Brittany Layton, Kate Noel, Chris Brown, Yuanqing Zhao, Melissa Quintanilha, Chris Myers, and the Cooperistas.

R. Brian Stone

I appreciate the ongoing support of my colleagues in the Department of Design at The Ohio State University with particular acknowledgment to Peter Megert, Paul Nini, Peter Chan, and Liz Sanders. It is important to pay tribute to all my teachers who have given me a solid grounding to live by design. Lastly, thank you to Professor Ken Hiebert, author of *Graphic Design Sources*, for introducing me to the idea of moving images in the context of design. It has taken hold of me and I hope that my work as a teacher of motion design does justice to your legacy, your willingness to venture into this realm of motion design.

I have had the good fortune of interacting with students from many parts of the world. With each engagement comes an opportunity to learn and grow. Each student has brought to bear a unique aesthetic and perspective on how motion may be used to communicate, entice, or excite. I have learned as much

from them as they have from me and I thank you all for your efforts to exceed my expectations at every turn.

In parallel I have worked with some remarkable design professionals. They have been extremely generous in sharing their processes and strategies. Some I have collaborated with and others have simply been mentors.

The field is replete with talent, but educators and practitioners often find themselves working in parallel tracks. The impetus for this book was to intersect those tracks—to provide a forum, or, more accurately, a starting point for dialogue between the academia and students that worked across academia and professional practice, intersecting all of these application areas (and the ones we haven't even imagined yet) that will define our work in the coming years.

I wish to dedicate this project to my students, who inspire through their curiosity, energy, and diligence, to my friends, as we laugh and grow in the face of all things, good or bad, and my family, for their unconditional love, encouragement, and nurturing. –Squatchee

Leah Wahlin

I am always glad to work on a project that allows me to step outside of my own disciplinary boundaries, especially one like this that aims to foster broad, complex critical thinking and conversation in its own right.

Special thanks to Graham—one of the supportive and wonderful people around me who make life better, easier, and more fun. I am grateful for my inter-disciplinary existence in the Department of Engineering Education and my stellar colleagues there. To all our authors and contributors—thank you for your wonderful work and your commitment to this project. If you find yourselves in Columbus, give us a call and we'll take you out for pancakes.

To connect with us and to see the works discussed in this book *in motion*, please visit **motionresource.com**.

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Since the real impact of motion design is in the actual experience of viewing and interaction, we have developed a companion web site to connect you to many of the examples described in the text. **www.motionresource.com**



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R. Brian Stone

The theory and practice of motion design

Motion Design is both work and play. It is expressive, seductive, and informative. It is akin to the movements of a beautiful dance performance, the gentle patterns of a light rain, or the wispy plume from a candle. It draws its influence from many sources and is an inherently collaborative and transdisciplinary activity. It engages the disciplines of graphic design, animation, cinema, journalism, music, computer science, broadcast media, and mixology. It is an incredibly rich, dynamic, active canvas involving creativity, choreography, and orchestration.

Motion Design is not about knowing how to use software, nor is it the gratuitous flashing graphics that we see on local television for a car dealership or appliance store. It is a creative mindset that enables us to construct multi-dimensional narratives that stimulate the senses, trigger emotion, hold our attention, and enhance understanding.

Motion Design is about the careful and purposeful use of moving images, content, and sound to convey messages. It is thoughtful, delightful, and grounded in human, not technology-centric, principles. Motion Design spans a continuum of application spaces, from the practical to the experimental, and its utilization has taken us to new places.

Motion Design is more than an emergent form of communication. It has permeated a broad range of applications, including brand building and identity design, product interfaces, kinetic data visualizations, TV and film title design, exhibition design, environmental graphics, and dynamic advertisements. It is an expressive and captivating way to reveal change through deliberate use of sequence and time.

This book, *The Theory and Practice of Motion Design: Critical Perspectives and Professional Practice*, is a collection of essays that capture the broad range of thinking that encompasses the field at this moment in time. It brings together an international and diverse range of perspectives from some of the field's leading designers, scholars, and thought leaders. It is not meant to be a comprehensive or exhaustive academic chronicle, but a lively discussion—intended to embrace the evolution, illuminate points of convergence, provoke new ideas, encourage new methods, and establish new partnerships.

So, why is this the time to be talking about motion design? What role does it play in our lives?

A point of convergence

We have a deep-seated reaction to motion. Arguably, it is part of our DNA, our biology—a component of our survival mode as a species. Our eyes continuously search around us, and our attention is most often caught by movements on which we concentrate and interpret. According to Eleanor Gibson's theory of perceptual learning, this likely developed as a survival skill (see Adolph & Kretch, 2015). Humans have the ability to observe objects along a continuous path and interpret that these objects cover and uncover parts of the background against which we see it. We are thus able to distinguish a predator moving in the brush... and, perhaps, we can then avoid being eaten.



Figure 1

Humans have developed the keen ability to distinguish and understand movement.

Motion Design represents a convergence of media, philosophy, and activity. It is the synthesis of visual and animation design principles used to communicate and/or amplify the meaning of messages. This is accomplished by showing dynamic spatial change over time, utilizing the layering of temporal elements such as movement, speed, sound, rhythm, depth, layering, responsiveness, and direction.

Content must be carefully considered in that certain concepts or narratives are better constructed and communicated over time. Content generally exists on a continuum of time dependent—time independent messaging. At one end, static, anchored messages, like a poster, have no requirement of change, and therefore are independent of time. To the other extreme, certain messages may be in a constant state of change such as human and animal locomotion, chemical reactions, weather conditions, or population growth.

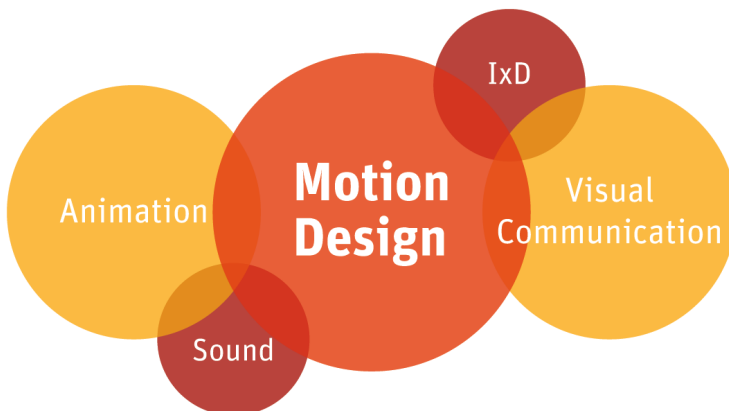


Figure 2

Motion Design is a synthesis of many complementary activities.

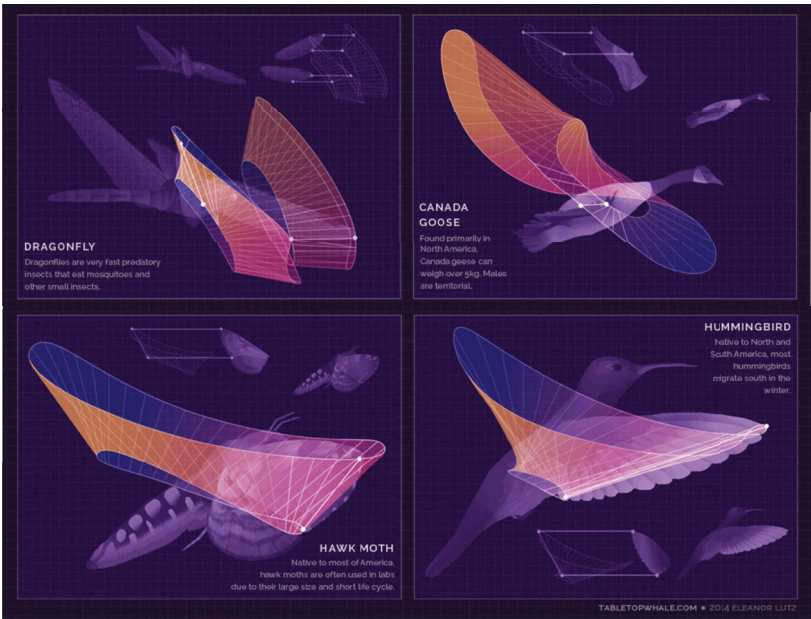
Principles and best practices on how we observe, evaluate, and critique work need to be understood and applied from animation, visual communication, and related fields. There are distinct yet important concepts in these areas that require integration as one studies and applies motion design. Motion design has expanded well beyond the purview of graphic designers, filmmakers, and photographers.

Biologist, illustrator, and designer Eleanor Lutz uses motion design from a scientific perspective, showing the intricate nature of biology and animal behaviors. Her motion design enables us to see and understand movements that would never be seen with the naked eye.

Figure 3
A mapping of wing movement patterns in slow motion by Eleanor Lutz.

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*This illustration is an
observational exercise
only. It does not
represent any peer-
reviewed, scientifically
accepted information.*



Motion design has permeated the space of television and mobile through refresh screens, interface behaviors, and transitions. For instance, on launch of the Roku streaming TV application, the logotype rotates in an interesting and whimsical way, rather than using a typical page load indicator. To introduce the features of the mobile-based learning app Elevate, the user is guided through 4 screens, which elegantly transition from one to the other. Motion design is purposefully applied in a way that carries forward graphic elements from screen to screen, creating a holistic presentation of the feature set.

Figure 4
The Roku streaming video service startup screen.

Source: Kern, 2013



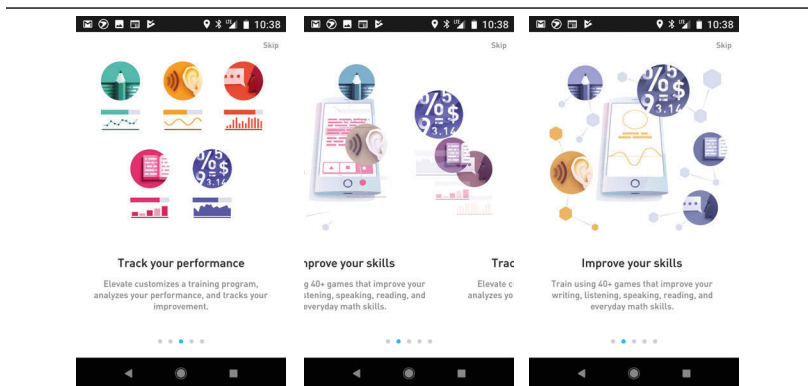


Figure 5
The beautiful transitions of the Elevate cognitive training app guide users through its feature set.

Source: Elevate Labs, 2014.

Motion design is realized in emotive iconography in Facebook's animated reactions. After more than a year in development, this feature made it so users were able to react to a friend's post with something other than a thumbs up gesture. Facebook developed this family that effectively shows a range of emotions by the distinct character of expression and motion aesthetics.

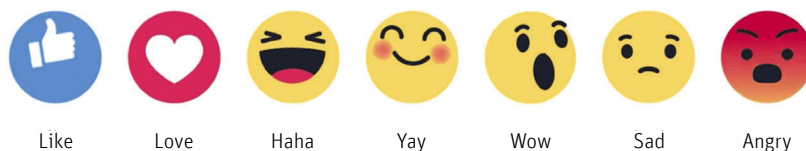


Figure 6
An extension of the Like button, Facebook's reactions express love, laughter, delight, surprise, sadness, and anger.

Source: WJHL, 2016.

We are no longer constrained to the printed surface. Electronic media has more easily enabled us to craft and distribute kinetic messages. We now have the near ubiquitous screen as an active changing surface. Designers are faced with new communication challenges that not only include what is on the screen, but at what times do elements enter and exit the screen. Words, graphics, objects, elements, and textual components move on and off screen like actors on a stage, all in a sequence of events to tell stories and construct meaning, as seen in this commercial produced by leftchannel for Giant Eagle.



Figure 7
leftchannel created a series of broadcast spots for supermarket chain Giant Eagle using a fun, graphic motion aesthetic to highlight the features of their fuelperks program.

Source: leftchannel, n.d. Copyright by leftchannel. Reproduced with permission.

Yesterday—Looking Back

While this is an exciting time in the evolution and ubiquity of motion design, our fascination with moving images goes much further back. Designers, cinematographers, and photographers have been thinking about motion as a communication strategy for decades. For example, the work of Eadweard Muybridge has been well documented—his studies using multiple cameras to capture the movements of animal locomotion pre-date the flexible perforated film strip. Jon Krasner (2008), in his book entitled *Motion Graphic Design: Applied History and Aesthetics*, lays out a brief history of humankind's depiction of motion through the arts. Early cinematic inventions such as the Thaumatrope and Zoetrope have played a role in how motion communication is constructed and perceived by audiences.

Krasner (2008) discusses several innovators such as Hans Richter, Man Ray, Mary Ellen Bute, and Oskar Fischinger who contributed to our understanding of narrative, form, film, light, and kinetics. Just as notable, graphic designers helped shape the space we now refer to as motion design. The “New” Graphic Design or “neue Grafik” of the late 50s to mid 60s gave rise to a visual language that tested the boundaries of print media and movement.

Even without the technological authoring tools we have at our disposal today, designers and educators of the 50s and 60s understood the power of representation through kinetic means. Swiss designer Peter Megert's poster for an exhibition of kinetic arts experimented with the effect of motion. Entitled “Light and Movement,” the poster created the illusion of kinetic activity as people viewed it while walking by. Although working in a static medium, Megert and his contemporaries recognized the captivating power of communicating the idea of movement—the concepts of activity and time. Another influential reference emerged from the work of Peter von Arx in his book, *Film Design*, which provided clear and rational explanations of the fundamentals of motion pictures as they relate to design education and communication. Through the work of their students, von Arx and his colleagues present the dimensions of film and the interwoven complexity of the medium, setting the context for many of the metaphors we use in present day authoring and education.

Figure 8
Peter Megert's
“Light and
Movement”
exhibition poster
conveys movement
and kinetic energy.

Copyright 1965
by Peter Megert.
Reproduced with
permission.



Figure 9
Studies conducted
at the AGS Basel,
Graduate School of
Design produced
this seminal book
by Peter von Arx
on film and design
education.

Source: von Arx,
1983.

As time progressed, American graphic designers Richard Greenberg and Saul Bass, who both amassed an impressive catalogue of award-winning motion-picture title sequences (of which several notable examples are discussed in the following chapters), paved the way for many of our contemporary motion designers such as Kyle Cooper, Garcon Yu, and Karin Fong. Their work in main title design gave rise to a new appreciation and awareness for the discipline and continues to be a central touchstone for thinking about the work of motion design.

Tomorrow—Looking Forward

One of the underlying themes in this text is the question of how we can prepare and shape what comes next in the world of motion design. We are witnessing an exponential rise in the application space, now inclusive of interaction design, product interfaces, kinetic data visualizations, brand building, title design, dynamic advertisements, exhibits and environments. Considering its emerging importance in our industry, the time is right to bring together a collection of work that examines how motion design has evolved, what forces define our current understanding and implementation of motion design, and imagine and make real the future of motion design as it unfolds around us.

This collection's essays and interviews approach motion design in two overarching areas of focus—as a set of theoretical questions and a creative professional practice. We intend to encourage deeper dialogue between practitioners and academics, expressed through the voices of both. Through this collection, it is our intent to aid in the discipline's advancement, promote collaboration and exploration, and celebrate the scholarship and broad range of professional activity in the space of Motion Design, as it was, as it is now, and as it hopes to be in the future.

For those working in academia, there are a lot of important questions being asked and theoretical frameworks being developed around the principles of motion design. These principles are being explored, examined and developed from several points of orientation. However, at times, academia provides limited opportunities to actually synthesize or apply those theories, reach a large segment of end users, and evaluate the outcomes over time. On the other hand, in professional practice, innovative uses of motion design are reaching broad audiences behind a push to produce work and learn on the go. In this case, though, the insights gained via this design process are not easily shared between companies or agencies, and the reason for the design decisions may be dictated by instinct and expedience, not necessarily a defined theoretical framework.

To be clear, there is nothing inherently wrong with approaching motion design through the lens theory or in professional practice; there are simply very real and reasonable limitations in the purview of each perspective. With this collection, however, we see a great opportunity to facilitate dialogue that aims to advance and illuminate motion design for those who work in both spheres. It is also important to note that the voices of educators and practitioners are not siloed in the book—the chapters are organized not by rigid interpretation

of role or career path into the two camps, but thematically as we attempt to highlight the cross-sections of shared interests in the theory and practice of motion design. We also recognize that many contributors to this book do not belong solely to one camp or the other, but, like us, find themselves working in both spheres at different times.

Part 1: Theoretical Perspectives, our contributors explore underlying ideas of motion design—its position in the design world, the science behind how we perceive and respond to motion, and its opportunities for growth as an intellectual discipline.

Section 1: Interdisciplinary Influences and Origins discusses the theory and practice of motion design as an amalgamation of activities emanating from art, cinema, experimental filmmaking, narratology, animation, design, and technological developments. This multitude of perspectives make it exciting and intriguing, but also challenging to teach and discuss. Dan Boyarski offers a historical perspective of typography’s connection to motion design, complemented by Dr. Clarisa E. Carubin’s discussion on the evolution of motion design through its definitions and scope. Camila Afanador-Llach and Jennifer Bernstein look at the interdisciplinary nature of motion design through the lens of teaching.

Section 2: Communication Theory takes on the challenge of developing new theories around how to communicate messages and structure narrative or experiences in the context of time-based, non-linear forms with dimensions of sound, text, and movement. Bruno Ribeiro, Michael Betancourt, and Spencer Barnes look at ways people craft narratives using motion and the ways in which meaning (connotative and denotative) is created in the context of motion design.

Section 3: Science and Perception explores issues around cognition and visual perception as it relates to reading and consuming moving messages. Elaine Froehlich and Daniel Alenquer discuss the science of perception from a biological and psychological perspective.

Part 2: Practice & Application, turns our focus to the “on-the-ground” experiences and perspectives of people actively working in motion design, or applying it through research. In this realm, motion is evolving to meet the needs of consumers and clients in exciting ways, and these chapters will offer a glimpse into the thought processes, strategies, and ideas that are bringing motion design to our eyes and fingertips every day.

Section 1: Brand Building and Identities illuminates the evolution of visual identity systems from static to kinetic forms. One could argue that most people today get exposure to brand identities through screen based applications. Jakob Trollbäck, David Peacock, Guy Wolstenholme, and Jon Hewitt describe this transition as a proactive means to communicate the value, narrative, and attributes of brand identity and brand promise.

Section 2: Interface and Interaction Design acknowledges the role that motion plays in communicating the behaviors and semantics of responsive

systems. Jeff Arnold discusses how motion aids in establishing a language of interaction. Gretchen Rinnert, Aoife Mooney, and Marianne Martens describe motion design as a collaborative activity in their development of a letterform-focused iPad app for children, while Andre Murnieks provides a glimpse into the future with a speculative project centered on responsive motion to voice activation.

Section 3: Narrative and Storytelling provides insight to how motion is applied in a sequence of events to reveal meaning, foreshadow stories, establish context, or present transformative narratives. Kyle Cooper and Karin Fong share with us their inspirations and processes for designing vivid, captivating, and iconic main titles. Adam Osgood describes a changing landscape for illustrators and examines the burgeoning role of and opportunities for animated illustration as part of modern digital narratives.

Section 4: Space and Environments provides a framework for the use of motion design in the context of small and large scale exhibitions. Supported with several concrete examples, Cotter Christian and Catherine Normoyle look at the multitude of motion design variables that impact one's perception of context and place. Christina Lyons provides a complementary narrative on motion as a key component in crafting interactive, personalized exhibition experiences for different audience profiles.

Section 5: Experimental Visualizations and New Applications features examples of works and ideas that explore the use of motion for purposes of discovery, provocation, insight, or expression. Steven Hoskins shares his explorations with split screen composition; Matt Pasternack shows the use of motion and story to describe a complex product ecosystem. Isabel Meirelles discusses the synthesis of information design and motion design as a means to translate data into visual forms that aid in deep understanding.

Section 6: Educating Motion Designers is a dynamic and evolving area that benefits from the input of both professional educators and practitioners. It is in our collective interest that we share best teaching practices with our colleagues while leveraging the lessons learned in the field. I provide an overview of my years in the field and a discussion of my teaching philosophy, looking at how motion design education has and should continue to evolve. Heather Shaw offers an approach to teaching that utilizes graphic notation. This leads us into a threaded conversation of reflections and advice from notable motion design practitioners Kyle Cooper, Daniel Alenquer, Karin Fong, Guy Wolstenholme, Jon Hewitt, Isabel Meirelles, and Jakob Trollbäck. They share with us their vision, expectations, and points of motivation with particular emphasis on advising students.

We believe a strength of this collection is its ability to give voice to a range of perspectives and areas of expertise. We hope *The Theory and Practice of Motion Design: Critical Perspectives and Professional Practice* will help shape the thinking and work of educators, students, and practitioners, along with those who interact with motion designers, commissioning or responding to their work. Visual communication and product designers, cinematographers,

interaction designers, marketers and consumers of moving images will all benefit from a deeper understanding of motion design.

R. Brian Stone, Associate Professor, The Ohio State University

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PART 1

Theoretical Perspectives

SECTION 1

Interdisciplinary Influences and Origins

Dan Boyarski

Clarisa E. Carubin

Camila Afanador-Llach

Jennifer Bernstein

SECTION 2

Communication Theory

Bruno Ribeiro

Michael Betancourt

Spencer Barnes

SECTION 3

Science and Perception

Elaine Froehlich

Daniel Alenquer



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Section 1

Interdisciplinary Influences and Origins

*"Motion is an abstract language with the
potential of being understood across cultures,
so it follows that type in motion may point to*

*a form of communication without boundaries.
How that form evolves remains to be seen."*

Dan Boyarski

Liberating Words from the Printed Page

It is known by different names—type in motion, motion graphics, kinetic typography, moving letters, and so on. What the names describe is a computer or movie screen filled with type that moves around, letterforms that morph, or words that appear and disappear to a musical beat. On the quieter side, there are measured sequences of words that tell a story, give instructions, or reveal a poem in silence. Examples today abound in film titles, music videos, television advertisements, web sites, apps, and information/service kiosks.

What is common to these examples is typography that doesn't stand still. In contrast to static or fixed type in printed matter, where ink is married to paper, type that relies on time as a design element produces dynamic form that is synonymous with new media, movies, and computers. These forms, shaped by time and motion, are often compared to performances of dance, music, and theater. There has never been a time when this much attention has been paid to type in motion. We have books and articles on the subject, courses of study, design firms specializing in motion graphics, and conferences and exhibitions devoted to showing and understanding this work. Motion is an abstract language with the potential of being understood across cultures, so it follows that type in motion may point to a form of communication without boundaries. How that form evolves remains to be seen.

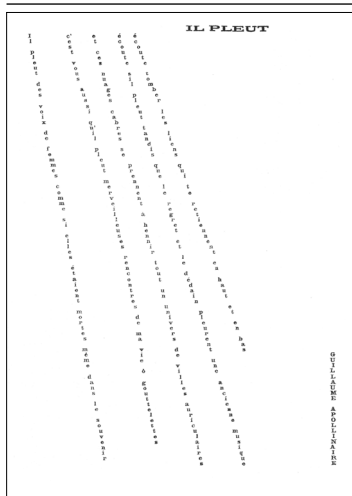
While we celebrate type in motion today, with easy access on our screens, it is instructive to look back over history to understand our fascination with motion and our attempts to capture and replicate it. Some of the earliest marks made by Western man in caves located in France and Spain attempt to depict hunts in progress. Hunters chase a large animal, shooting arrows at it, a scene forever frozen in time. Life is motion and artists over history have attempted to portray events in life, often by capturing a moment or a movement in time. The results have been paintings and sculptures, stories and dances, and more recently, photographs and films. In a 1956 *Paris Review* interview, the writer William Faulkner observed, "The aim of every artist is to arrest motion, which is life, by artificial means and hold it fixed so that a hundred years later, when a stranger looks at it, it moves again since it is life" (Stein, 1956).

Dynamic typography precedents

Graphic designers have a rich legacy of book design to build upon. Long before the advent of the moving picture (movies) in 1895, there were occasional attempts at giving life to type in print. A delightful example is Lewis Carroll's contribution, in his 1865 book *Alice's Adventures in Wonderland*, to visualize

Figure 3
"Il Pleut/It's Raining"
 by Guillaume
 Apollinaire (1916).

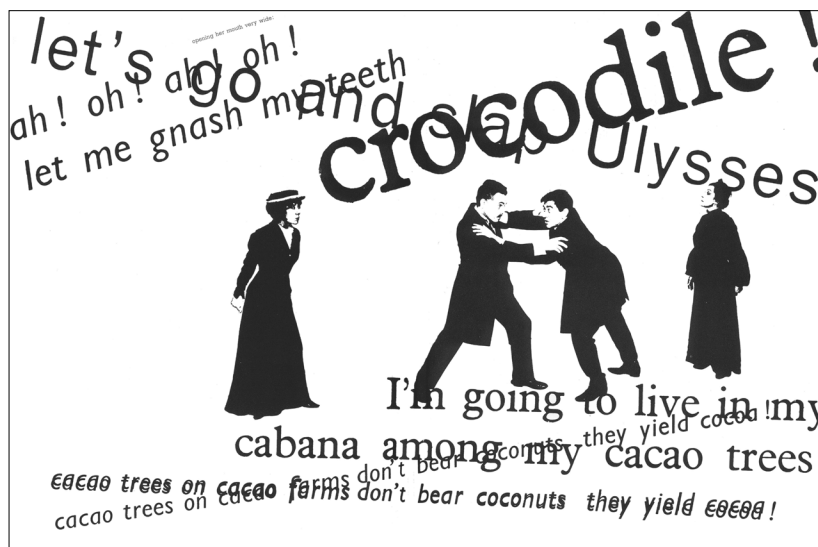
Source: Spencer,
 1983, p. 19.



Massin's *The Bald Soprano* in 1964—a book that re-presents Eugene Ionesco's absurdist play in printed words and images—raises dynamic typography to a new level. Massin's visually rich rendering of the spoken word allows the reader to hear different actors speak their lines in a far more engaging and faithful manner than conventional type ever could (Figure 4). It is sobering to appreciate the fact that this dynamic typography was achieved long before computers arrived on the scene to help “manipulate” type. The lesson here is that the tool is ultimately less important than the idea. True, while today's computers and software afford us a playground for broad exploration, that exploration has to be driven by an idea, often a desire to try something new, unconventional, and even absurd. The marriage of new thinking with new technologies has long been part of our history.

Figure 4
 Massin's
 visualization of
 Ionesco's play
The Bald Soprano.

Source: Ionesco,
 1964



How it started for me

As a graphic designer educated in the United States in the mid-1960s, I learned about typography, photography, illustration, and the thoughtful and skillful arrangement of those elements on single or multiple pages. These were formal, aesthetically-driven considerations, with occasional technical questions when we dealt with pre-press and printing issues. We never discussed time as an element for consideration, except in the context of deadlines. While in school, my heroes consisted of graphic designers like Glaser and Rand, photographers like Avedon and Penn, illustrators like Saul Steinberg, Folon, and the San Francisco psychedelic poster artists, musicians like the Beatles, Dylan, and Reich, and film directors like Fellini, Bergman, Ray, and Kurosawa. They all fed my visual and cultural education, the effects of which would not be felt for a decade or more.

Like most everyone, I grew up watching movies, both live action and animated, which I loved. Time as a design element became relevant when I began experimenting with a 16-mm movie camera and basic animation in graduate school in the early 1970s. I delighted in manipulating countless individual images, each with a minor change, and viewing them at 24 frames a second to produce the illusion of movement. Moving shapes, colors, and textures fascinated me, as did resulting patterns and rhythms. I discovered that I could work with time as a design element, one that I could control with as much precision as needed to produce the desired visual effect. 24 frames a second became the grid for decisions on speed, pacing, rhythm, and duration of elements on the screen. To quote a student I taught many years later, “I now appreciate how long and how short a second really is.” My heroes then were experimental filmmakers like Sharits, Emschwiller, Brackage, and especially McLaren.

Norman McLaren, an animator at the National Film Board of Canada, produced visually stunning and technically challenging short films during his 46 years at the Film Board, from 1941 to 1987. A unique technique of his was to work directly on clear film strips, by painting or scratching with a variety of paints and tools, allowing him to bypass the camera entirely. By projecting the resulting sequences, he created pure film motion—animated painting in the purest sense. This avenue of exploration into often abstract film animation has today been eclipsed by the more commercially lucrative animated stories of the Disney and Pixar kind. Thankfully, there has always existed a fringe element of experimental animators pushing the boundaries of the medium and ever-evolving technology.

As a grad student, I emulated McLaren’s way of working by applying strips of Letraset dots directly on clear 16mm film. Like McLaren, I didn’t know what the resulting film would look like until projecting it. A love of experimentation drove me to continue trying out different patterns of dots, combinations of dots, and even dots on the sound track, another McLaren trick of producing hand-made sound.

Kinetic typography

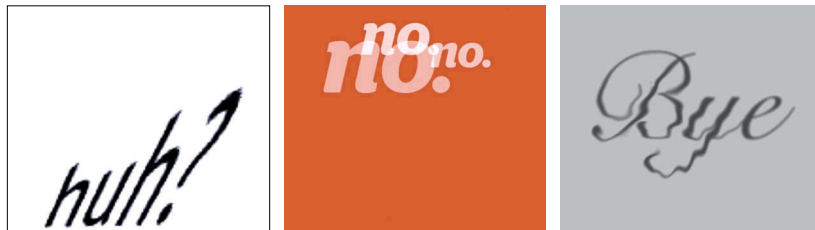
Fast-forward to 1994, when I was preparing an assignment for an Advanced Typography course at Carnegie Mellon. I realized that I was limiting students to type on paper, not unlike the way I was taught thirty years before. I wondered why I wasn't dealing with type in new formats and environments—for example, type that moved, similar to what we see in movies, on television, and computer screens. Why not liberate type from the page and give it motion and life? I also had in hand an early version of MacroMind Director, so I came up with a project that tasked the students to visualize spoken words in a dynamic way, making use of this new software. The results were stunning!

These early examples fell into two categories. One group used time to sequence the appearance of words or phrases in meaningful ways, while the other used time to animate words and move them across the screen. The key factor in all of them was the control available in making a word, phrase, or punctuation appear *precisely* when the designer wanted the viewer to see them. Each method produced videos that communicated ideas and feelings in ways unique to the time-based medium of computers. When comparing the differences between paper-based and computer-based communication, it became clear that the former dealt with the presentation of words on a page, words fixed in position, never changing. The latter dealt with a controlled presentation of words, based more closely on the spoken word than the printed word.

Visually interpreting spoken word is similar to live performance. Students start the project by reading their words out loud, listening carefully to their speed, volume, and pacing, then visually notating the written text. This notated text becomes the basis for early storyboards of how the live reading sounded. These may be done by hand or with Adobe Illustrator to produce “mood frames” prior to executing the final dynamic sequence on computer.

Figure 5
Student project
samples from
“Visual Voice.”

(left to right)
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The visual representation of how words sound when spoken aloud is at the heart of kinetic typography, as I have taught it over 22 years. Yes, there are many examples of moving type on screens— film titles (artofthetitle.com), music videos, personal explorations online—and I admire many of them for their ideas and artistry, while others tend towards meaningless and gratuitous motion. But what truly intrigues me is this representation of spoken word and the emotional response from an audience. Having heard comments over the years from those truly engaged when watching some of these videos—they laughed, they teared up—led me to question if words presented in a time-based manner could truly affect people on an emotional level. My conclusion

is yes, they can when 1) the words are well written, often in a monologue or dialogue format, and 2) they are presented in a manner that resembles the delivery, pacing, and nuance of spoken words. Giving visual voice to these words suggests that we hear with our eyes, a reference to Shakespeare's *A Midsummer Night's Dream* in which Bottom speaks of (paraphrasing) "man's eyes hearing, and man's ears seeing." Here we have words in visual performance, not unlike a stage or film performance. Time as a design element is common to stage, dance, and film productions. In fact, controlling and manipulating time is at the heart of live performance, and kinetic typography is but one form of live performance.

Inspired by stage performance, I tell my students that their words on screen are like actors on stage. Each letter or word or graphic element is an actor that needs direction on its entrance, performance, and exit. For example, a word makes its entrance with a slow fade, taking about two seconds. Its performance is to remain in place, vibrating slightly, for about three seconds. And its exit is again a slow fade, this time taking close to four seconds. The word/actor is given direction which produces behavior and personality. Each actor needs to be designed as part of a complete performance, much like a director working with actors or a choreographer working with dancers in shaping a whole and unified performance. Every year, I continue to be surprised, delighted, and moved by my students' work and I know there remains much to be explored in this rich area of communication design.



Figure 6, 7, 8, 9
Giving visual voice
to a passage from
Jack Kerouac's *On
The Road*.

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Time-based information design

Not all time-based pieces can or should be related to the spoken word. Some pieces are information-based, not performance-based, and these have to be treated differently. These information-rich pieces take advantage of presenting information in a dynamic, time-based manner. Time is a key element and, like most narratives, involves a sequence of facts/events with a beginning, middle, and end. Organizing information in a logical and clear sequence is a valuable exercise for a design student. Considering the audience you wish to reach and the goals for your piece, you proceed to design a clear and compelling sequence of word, image, and sound.

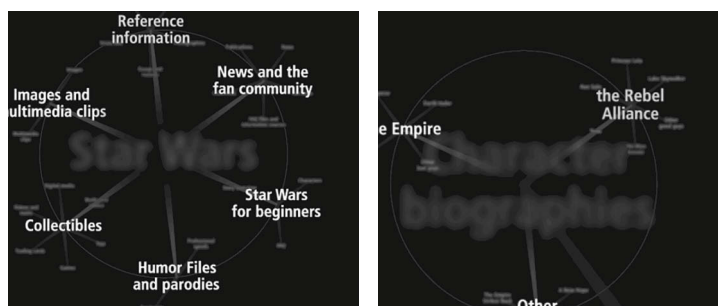
Explaining a simple fact is a good introductory project. Take one fact and explain it in 15 or 30 seconds. These constraints remind me of basic typography projects where the typeface, point size, and weight are all prescribed (only one of each), along with format size and color (black and white). From strict constraints emerge many ideas, some good, some weak, and some brilliant. When creating an explanatory video, when to use words? When to use an image in place of words? What is the communicative value of color, texture, and symbols? What does sound, not necessarily music, add to the rhetorical mix? And how does motion add to clarifying information—its content, structure, details, and navigation?

My favorite project in this genre is called Visualizing Information Space. I give each student a different artifact—a book, magazine, web site, or a film—and ask that they thoroughly familiarize themselves with its content and structure. I encourage them to begin visualizing the content and structure on large sheets of paper using lists, mind maps, diagrams, doodles—any method or technique that begins to explain the complexity and richness of content and structure. I stress new ways of visualizing, because it is easy to rely on a handful of software tools that generate flow diagrams or tree structures. My problem with these tools is that the results generally all look alike, with very little to distinguish one from the other. Their generic graphic language often hides the truth and complexity of the information.

As the project evolves, the paper visualizations are translated into dynamic time-based pieces on computer. The translation of “flat maps” on paper to a time-based narrative interests me. There are some analog map conventions that transfer to digital representations, such as spatial relationships, the use of symbols, color, and type. But I challenge the students to explore the unique qualities and potential of time-based media, with word, image, sound, and motion at their disposal. The results over the years have been illuminating. This is more than graphic design migrating to a dynamic screen, although it may be instructive to list long-held principles of page/map/diagram design and ask how many still pertain to this new digital environment. It is important for design students to appreciate the potential of time-based information design—presenting information over a given span of time. Does the sequence clarify the information? Does it help the viewer create their own mental model of the information space? Is it engaging? We can become experts in time-based communication as we have been experts in printed communication.

Figure 10
Zooming in and out of information space.

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We are learning to appreciate time-based conventions familiar to filmmakers, stage directors, and choreographers. Issues of spatial design in all three dimensions—x, y, and z (too often forgotten by graphic designers)—are critical to expanding our visual vocabulary beyond a two-dimensional page.

Shifts in scale, focus, lighting, color, and motion can all work in concert to convey information in compelling and accessible ways. Working with time to carefully sequence the display of information affords us control over what our audience sees when we want them to see it. It is specifically this issue of control that distinguishes print from digital information design. Even the best graphic designers realize that their best page or poster designs, with clear hierarchy supported by accessible typography, do not ensure that all readers will read the page as planned.

Dynamic interfaces

A connection between kinetic typography and interface design makes sense when one considers interface elements as comparable to typographic elements on screen. In other words, the semantic and syntactic considerations given to words on screen, as in kinetic typography, should be given to dynamic interface elements as well. Issues of visual representation, behavior, and transition are worthy of serious exploration beyond conventional graphical user interfaces (GUI) established with personal computers in the early 1980s, from the Xerox Star to the early Macintosh. In a relatively short period of time, we saw an increase in dynamic elements on screens, primarily icons that one clicked on and dragged to another icon to execute a command. That was certainly a lot simpler than memorizing and typing strings of code to execute the same command. At the time, the primary challenges to interface designers were screen size (real estate), low screen resolution, and the computer's processing speed.

Resolution and processing speed improved markedly over the decades, while real estate continues to challenge us today with multiple screen sizes and responsive layouts. The proliferation of apps on smartphones has raised the ante on dynamic interfaces. Motion as communication, not decoration, has given new emphasis to clarifying information and navigation on screens. A recent paper by Rebecca Ussai (2015)—*The Principles of UX Choreography*—makes a case for considering Disney's early principles of motion as inspiration when designing apps. She points out, "The most fluid, delightful, and intuitive experiences were always the ones that put detail into motion design." And the detail she refers to tends towards more realistic and believable motion, which helps breathe life into abstract and inanimate objects on screen.

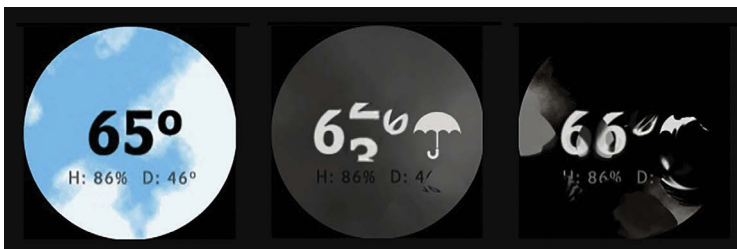


Figure 11
Dynamic weather interface for a small surface, like a watch. The interface shows the temperature, the current conditions as a dynamic image (including rain on the watch), and suggestions if one were going outdoors, like, take your umbrella.

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Learning lessons from our kinetic typography and time-based communication explorations over the past two decades, here are three principles that continue to guide our thinking about data visualization and dynamic interfaces.

1. Sequence. When presenting a large amount of data online, such as the contents of a major museum or a patient's health history, consider a sequenced revelation of data, rather than overwhelming with all the data at once. With appropriate chunking of content and a sequenced revelation of its parts, a user may begin to grasp the content's structure. Spatial relationships of data chunks may be introduced and clarified with meaningful sequence. Navigational opportunities may likewise be introduced (possibly in z-space?); the goal being to help users create a mental map of the information landscape they are about to traverse. Figure 10 is a good example of using z-space.

2. Macro/micro. Any good map provides two views of the information landscape: a big picture (macro) view and close-up (micro) views of specific areas. These views allow us to seamlessly move back and forth as we familiarize ourselves with the map and make decisions about where to go. Similarly, a good interface always has available both macro and micro views of the data. People will explore the information landscape in different and personal ways, attempting to make sense of it. Offering them the chance to zoom in and out of the data helps them understand and personalize the information space. Access to these multiple views should be clear, logical, and easy to navigate. Avoid dramatic changes in the way information is presented as the views shift; instead, consider meaningful transitions that help orient the viewer at any point in the landscape.

3. Transitions. Transitions between macro and micro views, or transitions between states or modes of interface elements, should be meaningful. As mentioned above, avoid making drastic changes to the information view. Most current web interfaces are still paper-based, with flat "pages" of text and graphics. Click on a linked word, and the old page disappears, replaced by a new page. The transition is often abrupt, much like a cut in film editing. Rarely do we see transitions comparable to a fade or a zoom in film, which adds not only grace to the shift in state, but allows for a sequenced appearance of new data, which can be cognitively meaningful.

Whereas a page from a book presents information simultaneously to the reader, who then has to make sense of it all with the help of good typography (we trust!), a screen of data does not have to behave like a paper page at all. We have the opportunity to sequence what the viewer sees, and in doing so, help them make sense of the data more quickly than if it were presented on paper. There is much to be studied here, and more user research would be helpful.

Reading on screen, in its broadest definition, is still not fully understood, and as a result, we rely too readily on print conventions for a medium that is unlike the printed page. We are still in the midst of a transition from book culture—static, linear, physical—to a digital culture—dynamic, non-linear, virtual, and interactive. In doing so, we borrow conventions from book culture

that are familiar, but not always applicable to the digital environment. It is our responsibility as dynamic information designers to be inventive stage directors, choreographers, and sound designers, as we shape information for display on screens of various sizes, for use in various situations, by people with various needs and desires.

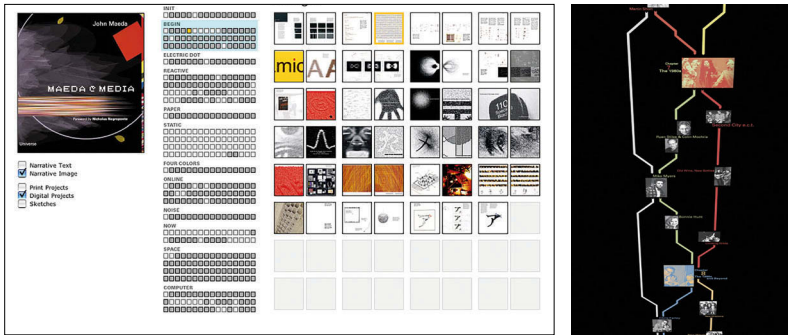


Figure 12, 13
*Visualizing the
contents and
structure of a book.*

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Conclusion

Communication design has emerged from graphic design with a broader definition of problem spaces to tackle and new technologies to explore. The printed page is joined by exhibition spaces, interactive apps, wearable digital devices, and assistive robots—all with communication as a goal. We have seen the introduction of courses that deal with web design, motion graphics, code and form, dynamic information design, and virtual spaces. Team work is as prevalent as solo work. Interdisciplinary collaboration and user research shape our design process. We are designing systems, services, and environments, with the goal of human engagement and response.

But it ultimately comes down to the human element that drives the work we do—the work of connecting people with each other through communication artifacts, many of them digital, that we carefully shape. With time as a critical design element, we have the opportunity to reconsider print and book conventions that have guided our thinking over the past five centuries and develop new attitudes and skills that shape content into performances and experiences that engage, inform, and delight. How we meet that challenge remains to be seen, but I trust we—practicing designers, students, and faculty—will do so bravely, creatively, and responsibly.

Postscript

The new book demands new writers!

El Lissitzky, 1923