APPLIED THEORY

SUMMARY

- Examines how motion can be used to create effective interactive information systems
- Demonstrates how a number of cinema techniques influence new media production and can be applied directly to technical communication practice

Looking to Cinema for Direction: Incorporating Motion into On-screen Presentations of Technical Information

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LEARNING TO THINK AS A FILM MAKER

Many technical communicators would claim to be quite knowledgeable about writing and manipulating text, and many of us also feel confident about how to effectively use static images in connection with our texts. But I argue that most of us would claim no true skill as film makers, and would admit to only an amateur's understanding of the complexities of cinematic presentation—we may know what we like and find enjoyable as audience members (story, characters, plot, and scenery), but are poorly prepared to discuss or critique cinematic techniques of presentation much beyond the level of what we would find in a local newspaper movie review.

Yet technical communicators are now often asked to create professional works for the screen (presenting online help systems, Web sites, and interactive training systems) using only an amateur's understanding of the medium of film, leaving many of us equipped only with print-informed compositional skills that we can apply to just one small part of the on-screen presentation process (Buckingham 2003).

As a result, a good deal of the information displayed on the screens that surround us every day has been designed by technical communicators and other information and interface designers who often have little or no training in film production, and no motion picture editing experience of any kind (Zimmerman 2001). We now live in a technology-filled world accompanied by a preponderance of badly informed screen designs that often make already devilishly complex systems even more difficult to use.

The goal of this article is to help technical communicators adapt to this important aspect of design and production by discussing how cinematic motion techniques can be used to properly present technical information for screened presentation. To help with this adaptation process I will

- Examine how the computer screen is actually a moving collage of many different formats, primary of which is the moving picture format
- Explain how the cinematic screen is understood by viewers and how that understanding can then be used to present viewers with a large amount of complex but well ordered information
- Conclude with a set of recommendations for effectively applying a few basic cinema techniques directly to technical communication practice

Users learn from prior media

While many users may complain of having to continually learn new software and new pieces of hardware just to get through everyday life, most users have, at the same time, become fairly adept at using screen-centered devices, even though the user interfaces presented on these screens sometimes vary a great deal from device to device, from activity to activity, and continue to change (some would say evolve) a good deal from year to year or even from

Manuscript received 1 July 2004; revised 14 December 2004; accepted 18 December 2004.

Orig. Op.	OPERATOR:	Session	PROOF:	PE's:	AA's:	COMMENTS	ARTNO:
1st disk, 2nd gh	woodss	4					00000

month to month (Norman 2004). One of the reasons many users may be able to adjust fairly easily to a continually changing collection of interfaces is that when users interact with what they see on screen, they rely on skills of comprehension acquired from viewing moving visual information contained inside the framing structure commonly referred to as the cinema screen.

The modern computer screen is essentially a cinema screen that has been lifted off the wall and carted away from the confines of the theater so it can be set atop our desks, clutched in our hands, or slipped into our pockets. And it is on this portable cinema screen where the fields of interface design, information design, writing, editing, film making, and many other forms of communication combine into what is often now called "new media" design and development. But as designer and critic Jessica Helfand has noted many times, new media is actually not a new medium at all; it is simply an extension of many different media elements and techniques gathered together into smaller, more intimate, and more invasive packages that appear on the screens of nearly every new device that we use (Helfand 2001).

Many new media designers and critics go on to note that interactive media presentations on the computer screen are actually collages of many media working in tandem, or in the case of poor design, many conflicting media working against each other (Gillette 2000; Andersen and others 1993; Burnett 2004). Therefore, even though the screen we use for presenting interactive computer interfaces is directly descended from the cinema screen, it is important to remember that the computer screen is also a collage of screen presentation and framing elements that long predate the development of motion pictures.

Users can often surmise what they need to do to interact with screened, interactive interfaces because computer interface design has been built on previous methods for the framing of textual and visual information adopted from painting, live theatrical presentation, and still photography (Laurel and Mountford 1990; Norman 1999).

Computer interface designers learned how to effectively present text on the screen by adapting techniques of paragraphing, categorizing, titling, indexing, notating, and linear collating from the production of books, tablets, and scrolls (which are frames and screens of a kind). The use of the printed page and its related technologies has become second nature to literate users, and therefore the frame of the page and its static presentation of text has served as the basis for the organizational metaphors that we still commonly use to describe many screen-based interface elements and even when describing computing itself—Web *pages* that allow for *scrolling*, *tab* dividers that provide access to different *folders* that contain *files*, *volumes* that store data, and processors which *write* data into a system (Bolter 1991).

Graphical interface designers have also borrowed widely from techniques of presenting proportion, color and depth learned from painting and still color photography (Packer and Jordan 2001), as well as borrowing some interactive techniques from the presentation of information in live theater (Laurel 1991). Therefore, even though many of the new media creations that appear on the computer screen may claim to be "new" in their specifics, in general application, they all build on presentation techniques that are old hat for most readers, viewers, and audience members.

Even though the computer screen may be used as a static device that can, for a short time, resemble a printed page or a still painting, the computer screen still presents only an abstraction of those media formats. As Walter Benjamin would likely note, with some updating to account for the computer screen, once a page has been reproduced on a screen, it is no longer a page, in the same way that a painting presented on a computer screen is no longer a painting (Richter 2002). Reproduction and translation from one medium to another makes the original into something altogether new or at least altogether different (Benjamin and colleagues 1996).

Screens depend on motion

Even if interface design and the interactive components of software screen presentation do begin with static formats, when these formats are intertwined with the remediation collage of the computer screen, they often require the essential binding element of motion to hold that collage together (Bolter and Grusin 1999). Initially static data such as text and illustrations inherit motion as part of the remediation process, and therefore, how viewers, readers, or users interpret these newly altered elements (texts, paintings, photographs) depends on how the system's designers present those element's newly acquired motion on the screen.

Integrating full-motion, film-like methods of visual presentation into a screen presentation does make the final construct appear more alive, more present, and therefore also, it is assumed, more compelling and interesting for users, and for this reason, designers are often asked to incorporate motion into at least some part of any screen presentation (Rieser and colleagues 2002). In the most basic sense it is often assumed that if a picture is worth a thousand words, then moving pictures must be worth thousands more.

It is true that adding cinema-like motion to an interactive system intensifies the way that users view and process information, an intensity that is extremely aggressive, demanding, and nearly all encompassing, often overwhelming all other methods for presenting text and graphics

Orig. Op.	OPERATOR:	Session	PROOF:	PE's:	AA's:	COMMENTS	ARTNO:
1st disk, 2nd gh	woodss	4					00000

(Johnson-Sheehan and Baehr 2001; Bergman 2000). Cinematic presentation is undeniably efficient at compressing a tremendous amount of information into an engrossing and persuasive format. The key point to realize, however, is that simply presenting information (textual, graphical) on a computer screen means that the information will always acquire some element of motion so that it is not possible to simply use motion as only "part" of a production when, in fact, the entire screen production (and everything that appears on the screen) is driven by motion.

The primary issue for designers who realize that they are now using motion throughout their entire creation on the screen is deciding what kind of motion is essential for the effective presentation of information, and deciding what kind of motion is simply a distraction, or worse yet, what type of motion can be so confusing that it drives away viewers. A film maker's solution for determining how to present motion revolves around the knowledge that when motion is used in true cinematic fashion to efficiently communicate information about time, space, and direction, it is never distracting (Stoehr 2002).

To improve what we do as professional technical communicators, we need to educate ourselves as film makers so we can have more control over the motion inside our screen presentations. This shift in identification and training can be difficult for information designers and technical communicators who have, thus far, been trained to frame or mediate information only through the static format of the printed page.

The fact that many new media designers and technical communicators do not have any specific film training does not seem shocking—most professional information designers don't have any training in film and its related technologies because, until very recently, they haven't needed it. We are a society designed to consume filmed images that speak at us through the dynamic screen in one-way conversations (DiSessa 2000). The television and the movie screen show us things, but (until very recently) viewers have not been asked to show anything back into the system. Therefore, most of us don't communicate through the system of motion pictures with any parity, and we don't interact with the system as creators but instead remain fairly permissive and passive viewers of screened information (Lunenfeld 1999; Wagman 1998).

Professionals with extremely specialized training have, for a long time, controlled the production and distribution of moving images, and most of these professionals (with a few exceptions) have not been considered a central component of our field. Until very recently, the field of technical communication has largely stayed outside the system of cinematic production. We may occasionally make use of film in our work (for example, adding a few "how to" film clips to an online help system), working as somewhat sophisticated consumers who use film as an add-on to our process instead of as the central, guiding focus for what we do as information designers and technical communicators. But if we are going to remain effective as professional communicators who now reside in a technical landscape increasingly defined by cinematic means of presentation, we must start thinking of ourselves, at least to some degree, as film makers (Zimmerman 2001).

Essential questions guiding the use of motion

To help us decide how to effectively incorporate cinematic techniques into an interactive information system or as an important part of a system's interface design, we need to first answer a few fundamental questions:

1. How does the way we view the motion picture screen influence how we use the interactive, cinema-like screen? Essentially, how do viewers see the screen?

2. Where do we look in the history of cinema to find the essentials of film defined in a way that is still relevant for use today, not only for modern cinema but also for interactive computer screen presentation? Essentially, what can the history of early film teach us?

3. What is the best way to use motion so that it is not distracting but instead becomes a vital part of leading viewers toward the information we want to present? Essentially, how does cinema clarify motion and intention?

4. What is the best way to present the sense of depth, space, time, and order of a system's information structure through the three-dimensional information space made possible by the effective use of cinematic technique? Essentially, how does cinema help us improve new media design?

HOW DO VIEWERS SEE THE SCREEN?

Many of us may not consider ourselves as film makers, but we certainly are well trained to be effective consumers of the moving image in a world saturated by screens. We are acutely aware of the screen when sitting in a cinema theater or when watching a television, but with the arrival of pervasive computing, screens have crept, often unnoticed, into even more areas of our lives (Joyce 2000; Rosello 1994). All around us screens flicker as animated images and onrushing streams of moving text swiftly slide from corner to corner, from top to bottom, from virtual page to page, pulsing with color, fading between light and shadow as these screens refresh themselves, draw and erase, flicker with life then dissolve into darkness. Some screens are silent, but many are accompanied by sound. Screens beep, sing, click, and hum, often in direct response to our engagement with what passes before our eyes.

Orig. Op.	OPERATOR:	Session	PROOF:	PE's:	AA's:	COMMENTS	**ARTNO:**
1st disk, 2nd gh	woodss	4					**00000**

Viewers see the screen as a conversation

Many screens talk with us through a fairly crude, stutter-step conversational exchange, pausing the flow of information across the screen to ask us direct questions. Yes or No? Save or Delete? Go Back or Go On? We click on a button to signal our response; an accompanying beep confirms our intentions; the screen flickers then shows us something new. But what, exactly, is a screen? And how is motion used to create this sense of conversation between the viewer and the screen?

In his important work in the field of new media theory, *The language of new media* (2001), Lev Manovich swiftly summarizes many years of visual media design and receptivity theory into his definition of the "classical screen" (Manovich 2001). He notes that the modern period of Western culture is ". . . characterized by an intriguing phenomenon—the existence of another virtual space, another three-dimensional world enclosed by a frame and situated inside our normal space. The frame separates two absolutely different spaces that somehow coexist." He then defines the classical screen as "a flat, rectangular surface . . . intended for frontal viewing—as opposed to a panorama . . . . it exists in our normal space, the space of our body, and acts as a window into another space. This other space, the space of representation, typically has a scale different from the scale of our normal space" (Manovich 2001, pp. 95–97). This is the screen that we have become accustomed to for the presentation of still images framed in painting or framed by the borders constraining a photograph or an illustration on the printed page.

When we introduce motion into this frame, the classical screen becomes, according to Manovich, a "dynamic screen" that imposes a specific viewing regime with the viewer, capturing the viewer's attention as a crystal ball does in story, taking the soothsayer on a journey that continually presents a new horizon while also offering, or at least implying, an unlimited field of view leading up to the next horizon. The dynamic screen, like a crystal ball, can also show visions of futures yet to come, visions of contemporaneous reality, and visions of worlds long past. And much like the crystal ball of fable that only shows "part" of the event (usually leaving out vital information to give a scene "context") the dynamic screen provides a highly subjective presentation of what appears inside the visible "frame."

Once motion is incorporated into the classical frame, images presented inside the frame and on this now dynamic screen are no longer neutral—if they ever were. A great many media theorists, especially Barthes, would debate the supposed neutrality of the static image (Barthes and Balzac 1974). Manovich claims that ". . . the screen is aggressive. It functions to filter out, to screen out, to take over, rendering nonexistent whatever is outside its frame" (p. 96). The most important element that is intimately connected to the presentation of motion on a dynamic screen is the element of time since time and motion are intimately linked with how we perceive and navigate the world (Aleksandrov and Gorskii 1991).

Viewers see the screen as a parallel time frame

The presentation of motion through time allows for the accurate recreation of a consciousness navigating through space, a space that exists in a specific time of its own (the time of the recording). But the time presented in a dynamic frame is different from the time presented in a classical frame for a painting or a page of text because a dynamic screen presents images that "live" in their own, ongoing, and active time frame that seems to exist for the viewer in parallel with the viewer's own time. Screen time and "real" time exist in parallel as long as the screen remains active and filled with moving images.

Even with rather extreme differences in how they represent time and space, the classical screen and the dynamic screen are similar by serving strictly as one way forms of communication—presenting information from the world inside the frame out into the world of the viewer, and then beyond into the frame of the viewer's consciousness (Dalle Vacche 2003). It is in this last transition, when motion from the frame escapes into the frame of the viewer's consciousness, that the unidirectional sense of "communication" becomes somewhat misleading to the viewer of the dynamic screen.

The regime of viewing that the dynamic screen promotes does draw viewers in and, to some degree, makes passive viewers feel connected to what they are seeing, thereby implying that there is also a degree of give-and-take, a meeting of consciousnesses that is part of the process of viewing moving images on the screen (Metz 1974a). This implied sense of participation or this meeting of minds (the mind of the viewer meeting with the consciousness that seems to inhabit the moving images on the screen) accounts for why lonely people turn on the television in an empty house for "company" and partly explains why audience members shout back at the movie screen to warn characters of the man with a knife hiding behind the bathroom door. We shout at the movie screen or seek the companionship of a flickering television screen because in some primal way we believe someone is there with us when the screen is lit, that there is some degree of consciousness in the screen itself.

Viewers see the screen as conscious

The presentation of motion on a screen and thereby the connection of that motion with its own time implies to the viewer that an active consciousness is giving life to the images that the viewer sees; the presentation of motion

Orig. Op.	OPERATOR:	Session	PROOF:	PE's:	AA's:	COMMENTS	ARTNO:
1st disk, 2nd gh	woodss	4					00000

progressing through time tricks viewers into believing that someone is showing them the world on display at exactly the same time that the viewer sees it. This sense of parallel and to some degree "paired" consciousness that accompanies the presentation and viewing of moving images on a screen is what gives film and television their undisputed and highly seductive powers of persuasion (Mellencamp and Rosen 1984; McLuhan 1962). But what happens when we revise this screening system yet one more time, adding true interaction with the screen, such as when we use the computer screen? And what happens when that interaction is negotiated through a shifting series of screens, within screens, as we now see with all modern graphical user interfaces and in interactive on-screen information systems?

Interactive screens allow users to touch another time frame

We now interact directly with our screens through a variety of input devices including even being able to touch the physical construct of the screen itself, and by implication, often therefore touching one or more of the virtual "screens" floating within the physical frame of the monitor sitting on our desk or within the PDA screen clutched in our hand. Being able to actually "touch" the images on the computer screen and move them around, rearrange them, delete them, shifts users from being a passive viewer of the time and motion presented on the screen to becoming part of the time and motion of the screen itself—interaction between a user and the elements on the screen shifts the user directly into the life of the screen itself.

Once users step into the world of the interactive screen they exist in the time of that screen where they can read texts; view video images; turn on and off various functions; pull down items; put things away; move items atop or below each other; and then move backward, forward, up, and down throughout the system. When connected to the Internet, users can also travel to far parts of the globe where they interact with distant collections of screens, pages, and windows that seem to coexist in time and space with the user's local screens, local pages, and personal set of windows.

As users employ, guide, and respond to the on-screen motions of a software system, they break through the wall of the screen and step into the "movie" of the system itself, and this point is where the true power of cinema can best be put to use in the presentation of information. If the world of information that users step into is conceived from the start as a film, as a truly immersive form of cinema, then the experiences that users have and the environments that they visit as they navigate through this "virtual" world will be consistent, reliable, and persuasively communicative. In other words, if designers think of everything they create for the screen as a form of cinema and employ the language of cinema extensively all through their work, then the information systems they create will be more effective and immediately "useful" for that system's users.

Deploying cinematic technique properly allows designers to provide users with a finely nuanced sense of depth, space, time, and order well beyond what is possible by using the static forms of presentation allowed by the printed page or the static image. Interactivity is motion. Cinema has developed the most sophisticated techniques for presenting motion on the screen. Therefore, cinema must become an essential component for designing effective on-screen presentations.

The incorporation of cinematic motion into information presentations means technical communicators need to begin thinking about how to present visual setting (establishing shot), spatial orientation (master shot), pacing (editing), motion vectoring (cutting to follow action), and shifting spatial composition for emotional and intellectual effect (montage).

WHAT CAN THE HISTORY OF EARLY FILM TEACH U.S.?

To find a set of techniques that can better guide us as technical communicators and designers, we need to look at some of the basic techniques that guide film makers in constructing persuasive worlds for the cinema screen. The problem with looking for these fundamentals is the fact that we are now surrounded by extremely sophisticated cinematic formats that often intermix many techniques at once, therefore making the fundamentals difficult to recognize immediately. But by looking back to the early days of film, when cinematic techniques were just beginning to develop, we may find it easier to examine some fundamentals that we can then bring forward into our own work as designers.

Early film reconstructed the idea of motion

Film as we know it now essentially began as a documentary format and was often advertised for its scientific possibilities and its ability to "honestly" document real life. This promotion of film as a semi-scientific form for careful documentation was a concerted effort to separate the early medium from the peek-show, vaudeville-like entertainment, and low-class venues where its visual progenitors had mostly been put on display (Grant and Sloniowski 1998). Promoting film as a serious component of science certainly made it easier to raise research and development funds from "respectable" sources, and it has also endowed the medium with an element of "truth telling" that has never quite disappeared no matter how fanciful and fantastic films have become (Mellencamp and Rosen 1984).

The writings about film from many early film makers are often filled with the sense of mission toward truth telling and documentation that is strikingly similar to the

Orig. Op.	OPERATOR:	Session	PROOF:	PE's:	AA's:	COMMENTS	ARTNO:
1st disk, 2nd gh	woodss	4					00000

mission of the dedicated technical communicator. The focus of much early film was on making the presentation of the moving image as life-like and as "real" as possible.

Early film constructed cinematic time and space

Because early film was brittle, cutting it was difficult. But as the physical medium improved, film makers began to connect different strips of film (shots) together as they worked through the first experiments with editing. Film makers discovered that when their edited shots were arranged into repeating sequences, they were able to impose an external "beat" on the individual shots, and this type of editing is what eventually came to be known as montage.

The projection of the filmed image itself, uncut, can connect the viewer to the "space" and "time" of the image simply by presenting moving images on a screen. But it is editing and montage that allow the film maker to expand and fully explore the dimensions of space and time surrounding her moving images (Metz 1974b).

Even though constrained by how often they could edit a single strip of film, early film makers were acutely aware that editing strengthened their presentations. Many early film discussions about the medium deal directly with the relationship between consciousness and the filmed image, and then go on to note that this relationship is made even more apparent through judicious editing (Colebrook 2002; Williams and Gledhill 2000).

The majority of cinematic techniques that early film makers discovered when first using and discussing their new medium are still relevant and are widely used today as the underlying essential components of every competent cinematic presentation (Flaxman 2000). In the same way that we still refer to the rules or "poetics" that Plato, Aristotle, and Cicero established for constructing a persuasive oral or textual argument, film makers today still depend on the classic techniques of cinematic construction established by the medium's first artists and developers.

HOW DOES CINEMA CLARIFY MOTION AND INTENTION?

Film making eventually became a highly complicated technological endeavor, requiring the assistance of many people with different specialized skills and access to large amounts of capital. But when it was in its infancy, it was a fairly simple medium that did not require extensive, specialized technical skill, and therefore, what passed through the lens onto film was often under the complete control of one or two people who also often considered themselves to be artists or documenters of a kind (Metz 1974a).

The first decade of film's development was as close as the medium came to the sensibilities of painting in terms of being truly the expression of a single artist working with a single medium. Additionally, the turn of the century was the age of the artist as a provocative and somewhat influential social critic, as technological innovator, as countercultural rabble rouser, as visual rhetorician, and as the author of many a passionate manifesto (Ureneva and colleagues 1981). In early 20th century Russia, the role of the artist as revolutionary and social thinker was paramount, and many of these artists were often quite articulate in text as well, therefore giving rise to some of the most technically practical and theoretically influential writings about how the new medium of film could be put to use to influence diverse audiences.

The Russian film maker Sergei Eisenstein (1898–1948) is considered one of the world's first truly important narrative and polemical film makers, and is also credited (incorrectly) with inventing the film montage—the sequencing of specifically timed edits for emotional impact. Many of Eisenstein's films have survived and are still studied in academic film programs, not only because they were early examples of editing for emotional impact and narrative control, but because his film work is still quite astounding, evocative, and emotionally compelling.

Eisenstein is important not only as a film maker, but as a writer and theorist who practiced his trade while also developing the theories that informed it, therefore making him ideal as a source for a useful, practical set of techniques for properly and persuasively assembling and then presenting screened motion. Eisenstein is important because he was an innovator in the medium itself, but was also the author of a number of insightful manifestos and poetics that still influence film makers nearly as much as the images he captured on film (Christie and Taylor 1993).

The primary reason Eisenstein's works are still studied and referenced today is the same reason we return to Aristotle's *Poetics* when teaching writing: Eisenstein firmly established the rhetoric, the techniques, the "poetics" for the moving image that have taught all subsequent film makers how to clarify the motion and time of real life into a cohesive, persuasive, and memorable visual statement that exists in a time and with a life of its own on the cinema screen.

Cinema defines rhythm through montage

One of Eisenstein's most important written works was a book-length presentation of his theories about film poetics, *Film form*. This book is, in fairly equal portions, a polemical statement about the power of film as received by the individual viewer combined with a Marxist-centered discussion of how to use that power for persuading mass audiences through the judicious organization of some fairly simple montage sequences (Eisenstein and colleagues 1998). While many people today would consider the Marxist sentiments in this work as somewhat quaint, the set of guidelines for creating effective montage that Eisenstein proposed in 1929 and the persuasive visual rhetoric he

Orig. Op.	OPERATOR:	Session	PROOF:	PE's:	AA's:	COMMENTS	ARTNO:
1st disk, 2nd gh	woodss	4					00000

derived from it remain quite relevant. What, then, are Eisenstein's thoughts about montage?

The first thing that a viewer notices about any montage is that it creates a visual "beat" or sense of pacing for the entire sequence of images. This beat either builds on the internal pace established by the motion of images across the frame in every individual component of the collage, or it imposes a completely different beat structure of its own, or it works as a combination of the two. Montage techniques derive their rhythm through repetition and from imposing a structure in time that is slightly external to the time of the images themselves, thereby strengthening the sense of consciousness that is already an inherent artifact of the screened moving image.

In brief, there are five techniques Eisenstein recommended for building various effective visual beat structures through montage:

1. Metric
2. Rhythmic
3. Tonal
4. Overtonal
5. Intellectual

Metric montage establishes parity Metric montage arises from the physical aspect of cutting film itself. Using metric montage, a film maker assigns a certain number of frames to the display of one thing, and then assigns the same number of frames for displaying something else, thereby creating parity or equality between the images' power of representation.

For example, imagine that a film maker wants to show the events that lead to a dog chasing a cat. The film maker first wants to show that the dog sees the cat and is thinking about chasing it. At the same time, the film maker wants to show that the cat knows it is being watched by the dog and is therefore considering running. To demonstrate that the dog and the cat are considering the upcoming chase with the same degree of attention, the film maker uses an identical number of frames to display a close-up of the cat's face as he does to display the face of the dog. Once the chase begins and the film maker cuts back and forth between the cat and the dog, the shots of each animal may be shorter, but through the use of metric montage, the amount of time (the number of frames) devoted to each remains the same.

The process of creating a metric montage is an obvious element of film production and is the first thing editors learn when cutting film. But in new media work, it is often ignored because designers often don't realize they are working within a cinematic medium and are essentially moving from shot to shot as they "direct" users through the various screens or "scenes" in their projects. Therefore, this basic cinematic technique for establishing equality is often mismanaged, not by jumbling many different paces at once, but instead by making everything in a system appear at the same rate—the equivalent of cutting together an entire film so that every shot in the film takes up exactly the same amount of screen time.

When first determining how long a specific shot should appear on screen, most print-trained designers who do not think as film makers often try to achieve a type of overall metrical parity with their design, making sure that everything remains on the screen for the same amount of time. This effectively flattens the presentation of information, making everything equally important, and therefore also making everything identical and hard to distinguish with any form of hierarchy. A classic example of this misapplication of metric montage is a standard PowerPoint presentation used in a public kiosk, set to automatically click through every slide using a set rate, thereby making everything equally important, and possibly also equally boring.

Technical communicators organize their texts with heading structures, call out boxes, captions, and headers and footers to visually identify the levels of importance for the information on the page. When preparing technical information for screen presentation, we should attempt a similar form of information ranking through the proper use of metric montage. If the information briefly appears, it is clearly of secondary concern, and shots of text and graphics that appear for a longer period of time on the screen are of more importance.

If those longer shots all appear for identical periods of time, then the viewer assumes that those shots and the information they contain are of equal importance. Screen time can therefore be used almost exactly the same way that we use textual classification systems—short screen time equals titles, longer screen time equals major headings, longest screen time equals the body text or the most important piece of information on the page.

Rhythmic montage focuses internal rhythms Rhythmic montage creates a "beat" driven by the length of the shots themselves (as with metric montage), but a rhythmic montage is also created by the motions of key elements inside the frame that move (with rhythm) during the length of each shot. The example Eisenstein refers to in *Film form* comes from the step sequence in his film *Battleship Potemkin*, in which he created a rhythmic montage showing the boots of soldiers marching down a wide set of stone steps, advancing on protestors gathered below. As the soldiers descend, they also raise their weapons and prepare to shoot into the unarmed crowd. Because the motion of the boots inside each shot has a beat of its own, the length of time that the film maker shows the boots varies depending on how long it takes each foot to raise and then strike a step. The strict rhythm of the soldier's boots that marks the approach of the armed men is played off the

Orig. Op.	OPERATOR:	Session	PROOF:	PE's:	AA's:	COMMENTS	**ARTNO:**
1st disk, 2nd gh	woodss	4					**00000**

disorganized and therefore un-rhythmic movement of the protestors. This contrast of rhythms immediately gives visual power to the soldiers and reveals the weaknesses of the protestors who are about to be overcome and killed.

This sequence is commonly also referenced as a demonstration of how cinema can effectively compress an event that takes place in a large space, with many actions occurring simultaneously, into a single, manageable screen space that presents one specific statement about what is happening. But it is the rhythm of the soldier's boots and the cutting of the film to match that rhythm that drives viewers through the sequence.

Rhythmic montage allows a film maker a greater freedom in structuring the cuts from one element to the next and allows the content of the images to drive the beat just as much as the length of the shot itself. Rhythmic montage is used a great deal in the presentation of dance on screen, thereby letting the beat of the dancers themselves drive the cutting forward.

For new media designers, using rhythmic montage means becoming aware of the internal beat created by the elements moving through or across a specific scene or component of a new media object, and then matching the cutting from scene to scene, or part to part, to best adapt to the beat established by the already-existing motion of the specific elements.

Cutting away too soon, or not letting the action of a scene complete itself before moving into a new area breaks down this beat and therefore leaves the viewer feeling that some important sequence has been interrupted or that something is wrong with the presentation technology. But more importantly, by using rhythmic montage effectively, the new media designer can call attention to the internal rhythmic structure of a section of the work, allowing users to focus on the activities associated with that rhythm. An obvious example of this is the beat structure established by the montage of moving from screen to screen (or essentially, from shot to shot) when using a familiar automated teller machine (ATM) to get cash.

Most ATM users are able to adapt fairly quickly to the different locations of screen elements that provide the basic functionality of a standard ATM (get cash, view account information, deposit money) because not only does the set of key functions remain fairly consistent from system to system, but so does the beat structure established by how long each screen remains after an action has been indicated by user interaction with the system. While color, composition, and textual arrangement are all memory cues for users in system design, users most easily remember the beat of a familiar physical or visual process (Attneave 1972).

With an ATM machine, the montage beat of screen information (visual) is directly connected to the beat of pushing the system's buttons (physical)—insert card, pause, select *withdraw money*, select *checking account*, select *twenty dollars*, pause, retrieve cash, retrieve card, pause as system resets (beat—pause—beat, beat, beat—pause—beat, beat—pause: an almost melodic structure). A well designed interface for an ATM machine should ensure that the visual beat of the on-screen information is closely connected to the physical beat of using the machine itself and that the system follows the beat structure most ATM users have come to know through thousands of previous uses of similar systems (Norman 1988). If the visual beat of the system's screens or "shots" is familiar for the user, the system will feel easier to use and give the user more confidence that the transaction has been secure and successful.

What would immediately capture a user's attention when using a new ATM system would likely not be the introduction of new screen elements, but instead an interruption in the pace of the rhythmic montage that the user has come to associate with the use of trusted ATM systems. A disruption in the pace immediately indicates to the user that an entirely new shot has been added to the familiar sequence (a new screen that asks additional questions from the user, or that provides additional information about the transaction). A disruption in pace might also indicate to the user that something is wrong with the transaction, and that a warning screen of some kind has just appeared or is about to appear, or worse yet, that something has gone wrong mechanically. For the interface designer, being able to work within the constraints of the rhythmic montage inherent in most ATM interfaces may be more important when updating the system's design than determining the arrangement of the textual or visual elements on any individual screen.

Tonal montage stimulates memory of experience

Tonal montage follows the cognitive reaction audience members have to certain presentations of real world experiences. For example, if the images show an environment filled with fog, then we know from experience that people become more hesitant to move forward quickly and more suspicious of their surroundings when surrounded by fog, so they move ahead slowly. Therefore, when creating a montage of elements that deal with fog, the cutting for the sequence needs to be slower, lingering on specifics to help "guide" viewers through the environment and also (if the film maker wants to heighten the sense of hesitancy and caution) providing cuts to elements that are so brief that they only suggest what is there, as if those shots were themselves dissolving into the murk of the fog.

For the new media designer, employing tonal montage means being aware of how people navigate through and understand real world environments, then looking for those "real world" elements in the on-screen work, and

Orig. Op.	OPERATOR:	Session	PROOF:	PE's:	AA's:	COMMENTS	**ARTNO:**
1st disk, 2nd gh	woodss	4					**00000**

cutting with them (presenting them in montage) in a manner appropriate for heightening the natural cognitive response to those elements. The goal here is to help the user make a link to real experience by matching the time of on-screen presentation with the way time is structured when experiencing the same event or action in real life.

Consider the creation of an interactive Web site for an artist's retreat along the coast of eastern Florida. This retreat is known for existing apart from the rhythms of the modern world. There are no phones or televisions in the artist cabins, and all the studios and cabins surround a communal eating hall where the artists gather each night to cook and share a meal. The retreat is surrounded by many acres of undisturbed wetlands that connect directly to a long stretch of preserved beach along the Atlantic shore. The pace of the location is measured by the weather, the ocean tides, and the work that the artists create in isolation but then share in public workshops every other day during their stay.

When creating a Flash-generated Web site for this retreat, the new media designer should match the rhythms of the physical location with a tonal montage that follows the rhythms of the retreat. Images of the beach and wetlands serve as backgrounds for the site, slowly shifting from one "shot" to the next in a tonal montage matched to the rhythm of ocean waves and lazy afternoon breezes. But when the user selects an option to learn more about the workshops—discussion sessions that can be rather frenetic and fast-paced—the snapshots taken at a recent workshop click by quickly, a fast slide show that matches the tone of the fast-paced workshop sessions. The user can choose to explore through the site using a map that appears on every screen, simulating a self-guided tour of the location itself. The overall tonal presentation is slow, using rhythms matched to the quiet surf, the breeze, and to a wandering exploration of a new place. In the same way that a filmed documentary of the retreat would use a nature-centered tonal montage for cutting together shots of the place, the Web site is constructed with the same nature-timed tonal montage in mind.

Overtonal montage reinforces experience Overtonal montage follows the cognitive component of the tonal montage and adds emotional response to it through additional montage elements that repeat or strengthen the original intention of the basic tonal montage. For example, when cutting together a sequence of people going to sea in small boats, the "reality" of the situation means that audience members are going to be already aware of the "beat" of the ocean waves, of the sensations of drifting, and of the energy needed to push oars through the water. The audience will also be aware of the sense of danger, caution and apprehension associated with being cast adrift on a vast ocean and therefore subject to the whims of a much larger, much more powerful living force beating beneath the hull of the boat.

The original tonal montage cuts from person to person, from boat to boat, using the underlying "beat" of the waves for guidance and the rising and falling motion of elements in the frame. Overtonal montage therefore cuts together longer sequences that follow this essential wave/beat structure, and perhaps lingers on shots of the sky where clouds are building, includes lengthy shots of the ocean itself spreading into the distance, and shows long shots of the people on the boats that make them small specks of motion set atop the much larger and more powerful motion of the ocean itself. This form of overtonal montage heightens the sense of powerlessness and isolation that might make the audience worry about what will happen to those people on the small boats.

For the new media designer, overtonal montage means looking at the entire presentation of motion throughout the length of a system's presentation to see if the "beat" for the montage is in tune with or somehow accompanies the already present tonal montage elements in the work. Expanding on my example of the Web site for the artist retreat, an overtonal montage would work with the opposition between the rhythms of the workshops (frenetic, spontaneous) and the rhythms of the surrounding natural environment (cyclic, pulsing), playing them off each other in an overtonal montage of increasing conflict (fast—slow, slow—fast, fast—slow, slow—fast, fast, fast—slow) as the user progresses through the site, representing the state of mind of the average artist who visits the retreat and finds that her artistic rhythms speed up as her work develops and benefits from the fast-paced exchanges with other artists. While individual tonal montages serve to match specific elements of the site to aspects of the physical location, the overtonal montage serves as the "statement" of the piece itself.

Intellectual montage encourages viewers to take action Intellectual montage is a montage technique Eisenstein positions as the final culmination of all elements of montage working together to motivate the viewer to take action in support of some kind of socially progressive cause. It is essentially an effective use of all the previous forms of montage that encourages the viewer to think about things from a fresh perspective and, most importantly, to take action based on this new point of view.

Intellectual montages that combine a powerful combination of metric, rhythmic, tonal, and overtonal montage techniques are most apparent in high-end television commercials and in music videos (which are also commercials of a sort). The goal of all of these intellectual montages is to create a "need" for a specific new technology of some

Orig. Op.	OPERATOR:	Session	PROOF:	PE's:	AA's:	COMMENTS	ARTNO:
1st disk, 2nd gh	woodss	4					00000

kind. The directors and editors of these commercials now use Eisenstein's montage techniques to perfection in a way that would certainly horrify Eisenstein since the techniques of visual communication and persuasion that he developed and championed are now being used to feed and support the very capitalist systems most of his life's work attempted to discredit and defeat.

The essential power of intellectual montage is vitally important to the new media designer and to the technical communicator since this form of montage encourages the user (viewer) to take specific action. An interactive information system depends on properly guiding users toward the specific information they seek inside the system. Using intellectual montage techniques in an interactive information system is a very efficient method of guiding users, through cinematic motion, to exactly where the designer wants them to go. In the example presented above, the Web site designer for the artist colony has been hired because the retreat wants to encourage more artists to apply—the site wants to "sell" the retreat. Intellectual montage can be used throughout the site as a selling and guiding technique.

A useful application of intellectual montage throughout the site would combine metric, rhythmic, tonal, and overtonal montage elements to not only sell the Web site user on the value of the retreat, but also to encourage the user to take the next step of asking for more information, or even going as far as signing up for a stay at the retreat. To accomplish this goal, the site designer would make use of metric montage in the early parts of the site to create a hierarchy of information, with shots that briefly appear at the start to build the title for the site, then using slightly longer screen time to display the major categories of the site itself. Tonal montage would then be used to give the user a "sense" of the rhythms of the actual location, followed by the use of overtonal montage to lead the user through the experience of creative awakening that a stay at the retreat would foster.

Once users have been convinced of the value of the retreat, they can be directed into the registration section of the site that follows a rhythmic montage similar to the pacing of an ATM machine asking for name, contact information, credit card information, and concluding with pushing the "submit" button. The intellectual montage has therefore done its job by convincing the user that a stay at the retreat would be valuable, and so the site deserves to receive more information or even money from the user. The user has been encouraged through the use of montage to fully explore the site, understand how the artist retreat functions, and then take action based on this new understanding.

Cinematic framing guides viewers through space

While editing different shots into a persuasive montage is a key part of presenting motion on the dynamic screen, the composition of the elements inside the frame of each one of those individual shots is equally important. Effective cinematic presentation relies not just on the use of motion and montage, but also on the construction of carefully composed shots that use the rules of visual composition and ordering developed from centuries of painting and still-image representation (Blakesley 2003).

Techniques learned from painting and still photography have educated designers in how best to direct the eye across a composition through the use of color and size and by using a vanishing horizon to present depth, and thereby a sense of spatial orientation and ordering (indicating to viewers what is close and what is far away inside the space of the frame). As technical communicators, we already know how these rules of composition apply to the printed page, especially when incorporating graphics with text; therefore, we are already familiar with many of these standard precepts for static visual presentation, especially when we apply them to providing "directional" clues to our users (Farkas 2000).

The dynamic screen is concerned with framing not just for the ordering of elements in the frame but for forcing viewers to look in a certain direction at a specific time. In the three dimensional information space of cinema, objects move in and out of frame, and the frame itself moves through the environment that it presents, continually shifting the composition of all the elements it contains while it moves; continually forcing the viewer to recalculate where the frame "is" inside any filmed sequence; forcing the viewer to imagine what is just past the frame, what is just about to appear from the left, the right, above or below, and what is just about to vanish from view (Rieser and colleagues 2002). The movement of the frame through the space that it presents positions the viewer in the privileged position of the camera operator. By placing the viewer behind the viewfinder of the camera, cinematic presentation strengthens the impression that what appears on the screen is the view of a parallel time and space that is actively being "seen" by the consciousness that lives in the screen.

For the classic screen, color and size are used to draw the viewer's (reader's) attention to a certain part of the page or canvas. This is a process of hinting that relies on the viewer (reader) actually taking the initiative to look in the intended direction. For example, the classic screen uses brighter color to draw the viewer's attention over darker color, and the representation of light asks the viewer to look away from shadow. This look can take place at any time, and it varies between viewers and readers who all approach the work at their own pace.

Orig. Op.	OPERATOR:	Session	PROOF:	PE's:	AA's:	COMMENTS	**ARTNO:**
1st disk, 2nd gh	woodss	4					**00000**

Because the classic frame is static, if readers look away for a moment, glancing up at the corner of the page or to the center of the canvas, they can always look back where they started since the frame and the images it contains are not moving, the images are not going to go away or slide off the page. While the designer of the classic screen can set guideposts for the viewer, it is the viewers who still direct how they progress through the information and the "space" presented on the screen.

The dynamic screen of cinema forces the viewer to take most of the frame in at once, second by second, since elements in the frame do move, sometimes very quickly, and so the frame itself directs the viewer toward specific items, one at a time or in clusters, using a pace completely determined by the film maker. The film maker says to the viewer, "I want you to look here now, and see this point here, now look here, and keep looking because I have told you (through a voice off screen) that someone is going to appear from the left. Here he is. Now, follow him." The frame effectively takes the viewers by the hand and leads them on a tour of the time and space being presented in the film, and does not let go of the viewers' hands until the tour is complete.

Effective cinematic presentation depends on the film maker being a careful tour guide, always leading the viewer forward through purposeful and confident direction. Poor cinematic direction means that the film maker doesn't recognize the power she has over the viewer and is not truly in control of the frame, eventually leading the viewer to become lost or confused, and eventually the viewer will step out of the stream of action, and the film then essentially vanishes or at least ceases to exist for the viewer (Metz 1982).

It is this tour guide aspect of cinematic framing that should interest us the most as technical communicators since this is also what we want to do as designers of useful screened information systems: we want to guide users directly toward the information they seek, using a firm, confident and persuasive hand throughout the trip.

Cinematic framing defines spatial relationships

The dynamic screen radically renegotiates the concept of the vanishing horizon as understood from a classic screen presentation. As the dynamic screen guides viewers through an environment, the horizon continually shifts, requiring viewers to constantly orient themselves as the frame moves. If the composition of single shots (and the overall composition of an edited sequence) provides the viewer with a basic orientation in the environment, the viewer can track the motion of the horizon throughout a fairly complex series of shots.

When the scene (and the viewer) shifts in time and space to an entirely new environment, the orientation process begins again. In a standard film, this orientation process is constructed through the use of establishing shots. An establishing shot is often an expansive medium or extreme long shot that shows the viewer all the key elements that will play a role in the upcoming sequence. The establishing shot is used to provide the viewer with a horizon to track, and also provides the user with basic orientation for any action that will take place in the upcoming shots. For an example of this, let us consider the way that an iconic Western movie would open its story.

When we first see the Stranger in the White Hat, an establishing shot displays a crumbling high desert town huddled in the distance. The train station stands to the left of the town, along the left edge of the screen. The rail line runs away from the town and the station, tracking along the left of the frame, approaching the Stranger in the White Hat and then going past him, out of frame and directly toward us, the viewers. The horizon shimmers in a horizontal line across the center of the frame. We may even see a veil of smoke drifting into the sky from behind the town, foreshadowing events to come but also giving us further orientation to the environment, indicating the depth of the town itself, and letting us know that there is more between the town and the empty desert stretching to the horizon (see Figure 1). F1

Establishing shots give us an indication along which lines (vectors) most of a sequence's action will occur. The lines of the shot I have just described indicate to viewers that the Stranger is going to ride his horse into town parallel to the train line, moving away from us toward the town, toward the horizon, and closer to that line of smoke that probably means that he is moving closer to danger and the first major action of the film. Establishing shots tell viewers about genre, they give information about the spatial orientation of the world inside the screen, and they also provide clues about the major direction for most of the film's action.

Every important sequence for any competent film begins with an establishing shot of some kind—if not immediately, at least within two or three shots in the sequence and before any major action occurs. Without an establishing shot, the audience members have no idea where they are and no idea how the elements in the environment are oriented, and therefore the audience does not have any indication where to look for action crossing the frame.

When users first use a new software system they want to be introduced to this new environment in the same way that viewers of a film want to be oriented to the world in the film. As soon as a system starts up, users want to know what kind of software they are using (genre), they want to know how all the actions for the system are organized (spatial orientation), and they want to know where most of the action for the system is going to take place (direction).

When a system's graphical interface first flickers to life, an establishing shot is essential for orienting users to the

Orig. Op.	OPERATOR:	Session	PROOF:	PE's:	AA's:	COMMENTS	ARTNO:
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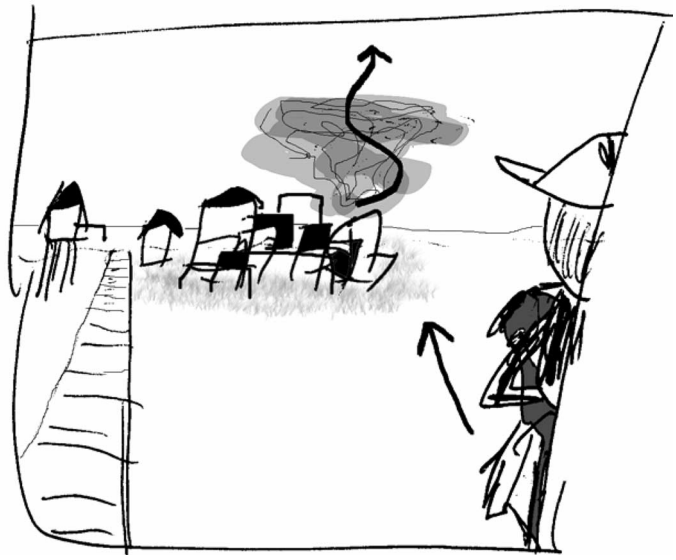

Figure 1. Rider in the White Hat approaches a desolate Western town. Notices smoke rising in the distance, indicating trouble. The lines of action in the frame indicate the vectors that the visual narrative will follow: the train line leads into and out of town (bringing players in and out of the action), smoke arises from trouble at the far end of town, the man in the White Hat slowly rides into town, moving through a new set of characters (players) and directly into the path of trouble.

world that they are about to enter. The construction of an opening sequence should provide users with a quick overview of all the elements they will encounter as they use the system. Ideally, when a piece of software is started for the first time, the "splash screen" or establishing shot will actually be a series of shots revealing how the system works as the interface for the system assembles itself before the user's eyes. Each major menu appears in the center of the screen then slides to the left, while to the right, a quick montage of images appears, demonstrating some of what can be accomplished by using elements on the menu to the left. When the montage finishes, the menu slides up into the interface becoming an active and useful part of the system.

This would be a highly cinematic method of combining an establishing shot with a tutorial, and it likely would become annoying after the second or third viewing. Once users become acclimated to the system, they can turn off this feature and instead dive directly into the interface itself.

The main Web site for a new media development and design company called Look and Feel New Media (http://lookandfeel.com) provides an excellent example of many of these techniques put to use in the opening animation

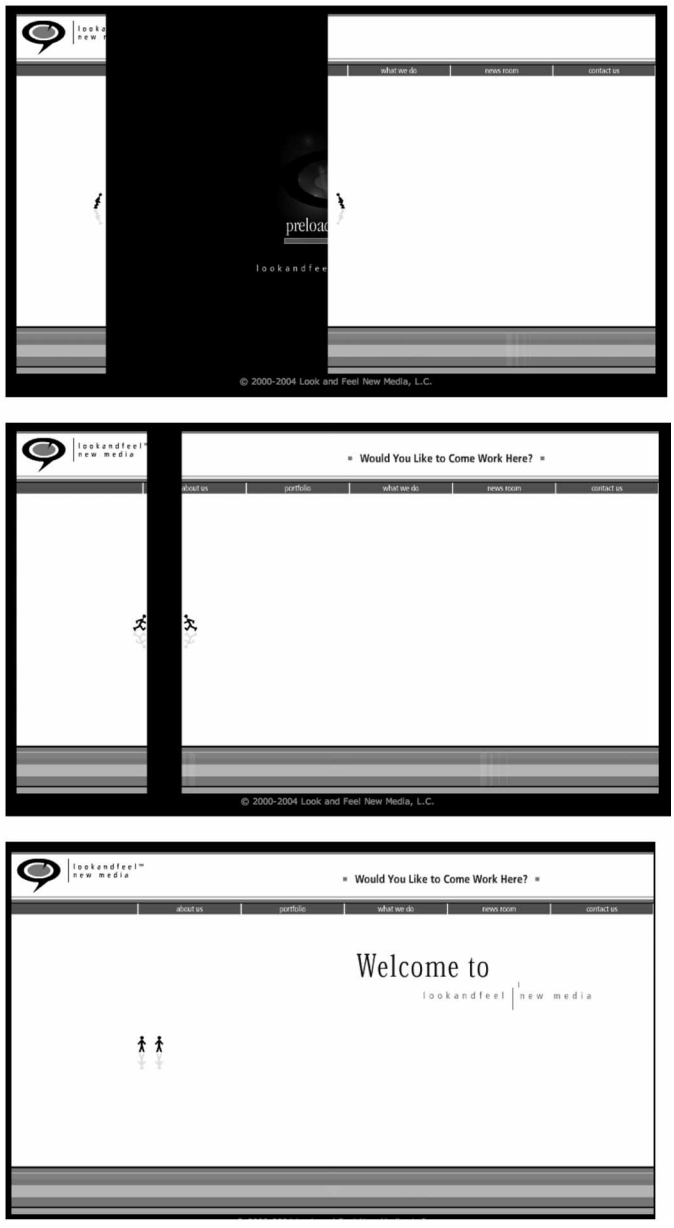

Figure 2. Two stick-figure animated characters push the screen closed to "begin" the film narrative of the Web site.

sequence for their company Web site. When visitors first arrive at this site, two small animated figures (Luke and Phil) push the "frame" or the main "screen" for the site together over the initial image of a Flash loading notice (see Figure 2). F2

From the moment the user arrives at the site, the frame is in motion, using a number of coy and whimsical references to film, such as a reference to the scene from Hitch-

Orig. Op.	OPERATOR:	Session	PROOF:	PE's:	AA's:	COMMENTS	ARTNO:
1st disk, 2nd gh	woodss	4					00000

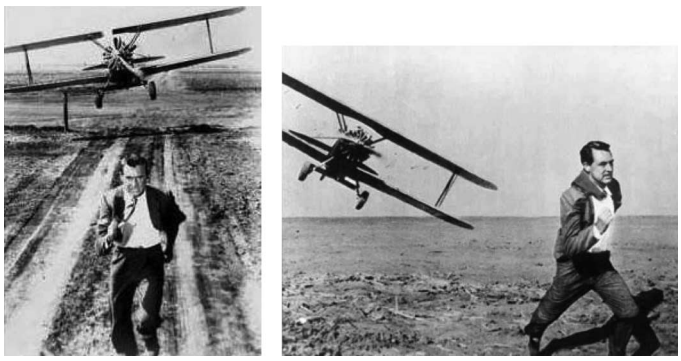

Figure 3. Cary Grant menaced by a bi-wing plane in the middle of nowhere. Scenes from Alfred Hitchcock's *North by northwest*.

cock's *North by northwest* in which Cary Grant is attacked by a bi-wing plane along a desolate stretch of road (see F3 Figure 3).

On the Look and Feel Web site, a tiny bi-wing plane swoops in from the side of the frame, and eventually dips down to snatch a thought-balloon from one of the animated characters, only to eventually crash into one of the dropdown menus that have started dipping down from the F4 navigation bar along the top of the window (see Figure 4).

The obvious goal of this design is not only to instruct users about the contents of the site but also to allow users (visitors) to play or interact with the characters and objects zipping around the site's main screen (page) as they try to dodge (or fail to dodge) the dropdown menus as the user clicks on them.

The animation of this opening sequence does not merely amuse; it also instructs. The dropdown menus take turns popping down to show the new visitor what areas are available behind this main "page" or opening screen of the site. An arrow appears below each menu as it drops, connected to a short line of text that tells the user what she will find by following the links on that menu. This site is a very clear example of the concept of using narrative cinematic technique not only to keep the viewer interested but to simultaneously tell the "story" of the site's structure, design and purpose.

Compositional opposition establishes order and structure

Once an establishing shot or series of shots has been used to define the spatial relationships of the world presented on the screen, composition can be used again to play one set of spatial relationships against another as an ordering system. Elements that seem closer and therefore larger in the frame can be used to indicate levels of importance—large and close indicating greater importance over small and further away indicating secondary importance. In *Film form*, Eisenstein discussed some of these forms of compositional opposition as forms of visual conflict.

Graphic conflict The combination of diametrically opposed elements in a frame, such as a hard element against a soft one. In Hitchcock's *Psycho* (1960), the shower sequence uses the opposition of the hard surface of the knife appearing in the same composition with the woman's soft skin.

The opposition of textures in a new media layout, with angular (hard) objects arranged over curved (soft) objects, presupposes a sense of harsh interaction or movement that is indifferent to the other items.

Conflict of planes The way elements in the frame face each other, with one taking a "higher" plane, therefore giving it prominence and a position of power in the arrangement. When moving objects toward or away from each other, placing one in a scene shows that it "dominates" the other elements on a lower plane. When Scarlett O'Hara appears to Rhett Butler (*Gone with the wind*, 1939) on a higher plane, from above Rhett on the stairs of her mansion, Scarlett is placed in a dominant position, even though she is the smaller element in the frame, simply because she has "position" over the man below her. As she descends the stairs her power diminishes.

In a new media work, bringing an object to the "front" of the screen, slightly higher than other elements indicates to users that this element not only is available for use, but indicates that it also has control over the other elements visible in the screen.

Conflict of volumes The introduction of one (or more) elements in the frame that takes up more space, more volume, than other items, and that is also in direct contrast to an opposing, slimmer element. A slim homeless man in a frame will seem to be dominated by an overweight banker. The domination is produced visually not through the social position of the subjects, but instead by the space they take up in the "world" of that frame. Volume also can indicate speed, assuming that the slimmer object would move faster.

In a new media work, especially when using three-dimensional modeled elements, viewers expect a certain ponderous motion from elements that take up more volume, and speed from those with less volume. Power and domination between the objects will also be assumed, with more power initially given to the item with more volume.

Spatial conflict An obstruction to our view, or the construct through which we look is given prominence and influences everything else that we see. In one of the "mem-

Orig. Op.	OPERATOR:	Session	PROOF:	PE's:	AA's:	COMMENTS	ARTNO:
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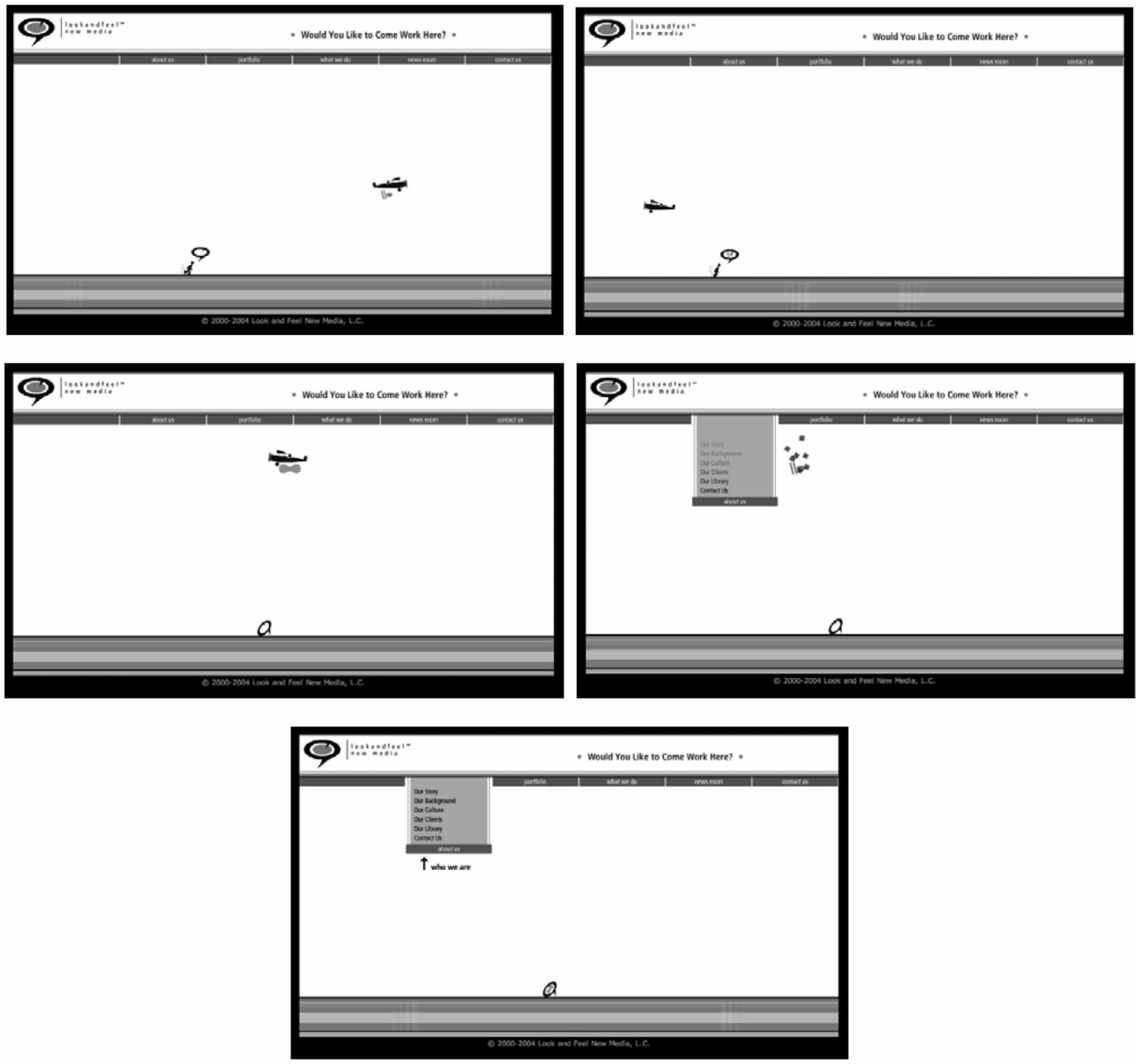

Figure 4. An animated character chases another character, steals that character's thought balloon; the plane crashes into a dropdown menu, then plummets to the bottom of the frame. A note appears below the menu, telling the user about how the site is organized and also enticing the user to view other menus.

ory" sections of Orson Wells' *Citizen Kane*, the audience watches Kane's parents sign away their child to a rich man who seeks an heir. While watching the parents plan the child's future, the composition arranges a window that allows us to watch the child Kane playing outside in the snow with his sled (Rosebud), oblivious to how is life is about to change. The house dominates the shot and is dark (while the outside snowfield is light, lively), foreshadowing

Orig. Op.	OPERATOR:	Session	PROOF:	PE's:	AA's:	COMMENTS	**ARTNO:**
1st disk, 2nd gh	woodss	4					**00000**

that the change to come may ultimately not be in Kane's best interest. The house is also confining while the outside is free and open, indicating the two paths Kane's life could take.

In a new media work, the construction (window, porthole, Web frame, browser window) through which the user views or works with other elements determines how the user will interact with the elements being presented. The designer can use the frame within a frame not only to draw the user's attention to the area inside the innermost frame, but also to clearly identify the fact that the information in the innermost frame is descended from the information that comprises the outermost frame.

Storyboard framing charts direction and shape

Setting up all the montages and compositional oppositions for an extended sequence or for an entire film requires a detailed knowledge of all of the motion of the film's sequences that will interact with each other throughout the "time" of the film. To help chart all this action, film makers often use storyboards that lay out, like a comic book, all of the major actions for long sequences, or even lay out all the major shots for the entire film. A storyboard not only demonstrates the composition of elements inside a frame; it also indicates the direction of action (the vectors) that screen elements will take throughout a scene, and indicates the shifting location or movement of the frame itself.

Reviewing all the frames of a storyboarded sequence allows film makers to carefully consider where to place the camera to capture the most effective establishing shot, and the storyboard can help the film maker decide whether the overall progression of the film's motion guides or points viewers in the right direction. For the presentation of a cinematic, interactive information system, the use of a storyboard can be vital for helping a designer create establishing shots, montage sequences, and specific forms of framed motion; a storyboard helps the designer see how the users will interact with the screen elements across the entire length of a project.

Storyboarding every "sequence" or "scene" in an interactive information system allows an information designer to chart the "direction" of how that system's information is going to arrive on the screen and where it will exit as users are done interacting with it. A storyboard can help the designer see whether the overall direction of a piece is primarily rising action with many shots that include action moving up across the screen, or whether the primary direction of a piece is from left to right. Once a designer has examined all of the lines of action for a sequence, the designer can then better assess how well all of the information presented in the system is being ordered for the user, and how the relationships between the moving elements strengthen or weaken the overall "statement" of the piece.

HOW DOES CINEMA HELP US IMPROVE NEW MEDIA DESIGN?

The limited amount of motion available for screen presentation in early systems limited the degree that cinematic technique could be applied to the design of most systems and therefore how motion was presented on screen was often not considered vital for dictating how users interpreted what they saw (Schneider-Hufschmidt and colleagues 1993). But screen and computing technology has continued to improve to the point where full motion video and film can now be presented just as smoothly on the computer screen as it can on the television or standard cinema screen. Computer screens have now truly become cinematic devices, and so everything that appears on these screen should follow some basic cinematic rules for directing, ranking, and pacing. The information designer, the technical communicator, and the new media developer must now begin thinking as film makers and ensure that the works they create for the screen function as effective pieces of interactive cinema.

Cinema defines three-dimensional information space

Just as film makers do when first imagining their films, technical communicators need to consider the three-dimensional information space they are creating for their users through cinematic display. The most important thing to remember about this space is that users will indeed be moving through it and so the technical communicator needs to ask a few basic questions about that space.

- How large is the information space?
- How are elements in this information space related to other elements in terms of what is close to the frame and what is far away?
- What is the central focus of the action for this space and for the overall system, and how does that action influence how elements should enter and then leave the screen environment?
- Is there more than one central information space (environment) for the system, and if so, then how will users know that they are being moved among these different spaces?
- How does the transition from one space to the next affect the pacing of the entire presentation, and is this pacing in conflict with the other rhythms established elsewhere in the work?

The answers to all of these questions can be found by looking to solutions already provided by film through the use of the basic building blocks of cinema: framing, editing, montage, and compositional conflict.

Orig. Op.	OPERATOR:	Session	PROOF:	PE's:	AA's:	COMMENTS	ARTNO:
1st disk, 2nd gh	woodss	4					00000

Cinema gives shape to action, intention, and direction

When thinking as film makers, the technical communicator can establish a sense of the system's cinematic life, and make use of film's building blocks for effective information presentation by

- Building effective montages to set the pace of a system's action so users know what to expect even when they encounter new information as they move through the system
- Using metric, rhythmic, tonal, overtonal, and intellectual montage to establish the ranking of information and to match a system's interface design with a real world experience, thereby encouraging the user to take a specific action
- Orienting the user to the spatial relationships and spatial hierarchy of the system's information through the use of establishing shots that show a user how the system is organized and to establish expectations for where the user can go inside the system when seeking specific types of information.
- Using visual conflicts of composition to rank information for the user and to lead the user coherently from one on-screen "space" to the next
- Designing the overall experience with a consistent presentation of motion so users will know when they have begun a system, when they have progressed through the center of the system, and when they have finally come to the end of the system
- Charting the entire shape and pacing for a project through the use of extensive storyboards that not only track the static composition of individual screens but also chart the motion of elements within each shot and the motion of the user progressing from scene to scene.

I realize that it may seem extremely time consuming and somewhat unproductive to apply every component of this type of cinematic analysis and motion pre-design to something as conventional and seemingly static as a textual online help system. In many cases, approaching our current on-screen design work through a print-informed sense of design still can produce useful on-screen products. But cinematic presentation is already a central part of interactive screen presentation for gaming, entertainment software, and Web promotion, so it is only a matter of time until users begin to expect similar cinematic sophistication from help systems and practically everything else they interact with on the screen.

The power of cinema lies in its ability to compress a vast amount of information into an easy-to-understand visual and textual format that offers a realistic and highly persuasive window into another world. This is also what we hope to accomplish as technical communicators as we make a great deal of complex information easy to understand through compression, editing, and reformulation, to then provide our readers and viewers with a view into a new world of information. Because we already share many of the goals of the film maker, it makes sense to begin to learn from film-making practice to further strengthen what we write, organize, develop, and present on the interactive cinema screen. T**C**

REFERENCES

Aleksandrov, V. V., and N. D. Gorskii. 1991. *From humans to computers: Cognition through visual perception.* Singapore and Teaneck, NJ: World Scientific.

Andersen, Peter Bøgh, Berit Holmqvist, and Jens F. Jensen. 1993. *The computer as medium*, *Learning in doing.* New York, NY: Cambridge University Press.

Attneave, F. 1972. Representation of physical space. In *Processes in human memory*, ed. E. J. Martin and A. W. Melton. Washington DC: V.H. Winston.

Barthes, R., and Honoré de Balzac. 1994. *S/Z.* 1st American ed. New York, NY: Hill and Wang, 1974.

Walter, B., M. P. Bullock, M. W. Jennings, H. Eiland, G. Smith, and R. Livingstone. 1996. *Selected writings.* Cambridge, MA: Belknap Press.

Bergman, E. 2000. *Information appliances and beyond: Interaction design for consumer products.* San Francisco, CA: Morgan Kaufmann Publishers.

Blakesley, D. 2003. *The terministic screen: Rhetorical perspectives on film.* Carbondale, IL: Southern Illinois University Press.

Bolter, J. D., and R. Grusin. 1999. *Remediation: Understanding new media.* Cambridge, MA: MIT Press.

Bolter, J. D. 1991. The idea of the book. In *Writing space: The computer, hypertext, and the history of writing.* Hillsdale, NJ: Lawrence Erlbaum Associates.

Buckingham, D. 2003. *Media education: Literacy, learning, and contemporary culture.* Cambridge, UK, and Malden, MA: Polity Press and Blackwell Pub.

Burnett, R. 2004. *How images think.* Cambridge, MA: MIT Press.

Christie, I., and R. Taylor. 1993. *Eisenstein rediscovered*, *Soviet cinema.* New York, NY: Routledge.

Orig. Op.	OPERATOR:	Session	PROOF:	PE's:	AA's:	COMMENTS	**ARTNO:**
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Colebrook, C. 2002. *Gilles Deleuze.* New York, NY: Routledge.

Dalle Vacche, A. 2003. *The visual turn: Classical film theory and art history.* New Brunswick, NJ: Rutgers University Press.

DiSessa, A. A. 2000. *Changing minds: Computers, learning, and literacy.* Cambridge, MA: MIT Press.

Eisenstein, S., R. Taylor, and British Film Institute. 19998. *The Eisenstein reader.* London, UK: British Film Institute.

Farkas, D. K., and J. B. Farkas. 2000. Guidelines for designing Web navigation. *Technical Communication* 47(3): 341–58.

Flaxman, G. 2000. *The Brain is the screen: Deleuze and the philosophy of cinema.* Minneapolis, MN: University of Minnesota Press.

Gillette, D. 2000. When media collide. In *Weaving a virtual Web: Practical approaches to new information technologies*, ed. Sibylle Gruber. Urbana: NCTE, pp. 3–13.

Grant, B. K., and J. Sloniowski. 1998. *Documenting the documentary: Close readings of documentary film and video*, *contemporary film and television series.* Detroit, MI: Wayne State University Press.

Helfand, J. 2001. *Screen: Essays on graphic design, new media, and visual culture.* New York, NY: Princeton Architectural Press.

Johnson-Sheehan, R., and C. Baehr. 2001. Visual-spatial thinking in hypertexts. *Technical communication* 48:22–30.

Joyce, M. 2000. *Othermindedness: The emergence of network culture*, *studies in literature and science.* Ann Arbor, MI: University of Michigan Press.

Laurel, B. 1991. *Computers as theatre.* Reading, MA: Addison-Wesley.

———, and S. Joy Mountford. 1990. *The art of human-computer interface design.* Reading, MA: Addison-Wesley.

Lunenfeld, P. 1999. *The digital dialectic: New essays on new media.* Cambridge, MA: MIT Press.

Manovich, L. 2001. *The language of new media.* Cambridge, MA: MIT Press.

McLuhan, M. 1962. The twentieth century encounter between alphabetic and electronic faces of culture confers on the printed word a crucial role in staying the return to the Africa within. In *The Gutenberg galaxy: The making of typographic man.* Toronto, ON: University of Toronto Press.

Mellencamp, P., and P. Rosen. 1984. *Cinema histories, cinema practices.* Frederick, MD: University Publications of America.

Metz, C. 1974a. *Film language: A semiotics of the cinema.* New York, NY: Oxford University Press.

———. 1974b. *Language and cinema. Approaches to semiotics, 26.* The Hague: Mouton.

———. 1982. *The Imaginary Signifier: Psychoanalysis and the cinema.* Bloomington, IN: Indiana University Press.

Norman, D. 1999. *The invisible computer: Why good products can fail, the personal computer is so complex, and information appliances are the solution.* Cambridge, MA: MIT Press.

———. 1988. The power of constraints. In *The design of everyday things.* New York, NY: Doubleday Currency, pp. 60–62.

———. 2004. *Emotional design: Why we love (or hate) everyday things.* New York, NY: Basic Books.

Packer, R., and K. Jordan. 2001. *Multimedia: From Wagner to virtual reality.* 1st ed. New York, NY: Norton.

Richter, G. 2002. *Benjamin's ghosts: Interventions in contemporary literary and cultural theory.* Stanford, CA: Stanford University Press.

Rieser, M., A. Zapp, British Film Institute, and Zentrum für Kunst und Medientechnologie Karlsruhe. 2002. *New screen media: Cinema/art/narrative.* London, UK: BFI.

Rosello, M. 1994. The screener's maps: Michel De Certeau's "Wandermanner" and Paul Auster's hypertextual detective. In *Hyper/Text/Theory*, ed. George P. Landow, 123. Baltimore, MD: The Johns Hopkins University Press, pp. 121–158.

Schneider-Hufschmidt, M., T. Kühme, and U. Malinowski. 1993. *Adaptive user interfaces: Principles and practice.* Amsterdam, Netherlands, and New York, NY: North-Holland.

Orig. Op.	OPERATOR:	Session	PROOF:	PE's:	AA's:	COMMENTS	**ARTNO:**
1st disk, 2nd gh	woodss	4					**00000**

Stoehr, K. L. 2002. *Film and knowledge: Essays on the integration of images and ideas.* Jefferson, NC: McFarland.

Ureneva, I., R. V. Katanian, Soviet Union Reel Images, and Video Images (Firm). 1981. *Sergei Eisenstein.* Monroe, CT, and Sandy Hook, CT: Reel Images and Video Images.

Wagman, M. 1998. *Language and thought in humans and computers: Theory and research in psychology, artificial intelligence, and neural science.* Westport, CT: Praeger.

Williams, L., and C. Gledhill. 2000. *Reinventing film studies.* London, UK, and New York, NY: Arnold and Oxford University Press.

Zimmerman, M. 2001. Technical communication in an altered technology landscape: What might be. *Technical communication* 48:200–05.

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