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Tracing Motion

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Tracing

Motion

Stephanie Clark
I experiment with this idea using present-day tools which afford my own movement during the capturing process to create various visual interpretations of motion.

This document explores the use of motion within design to defamiliarize a message. The objective is to expand a viewer's level of understanding through prolonged perception.

I look to László Moholy-Nagy, Aleksandr Rodchenko, and Eadweard Muybridge who explored the use of the camera, the new technology of their day, to understand its potential to create a new visual language. They believed the lens of the camera was the eye of the future, and the public's exposure to the camera's possibilities to be an enlightening transcendence.

I also believe in exploring newly developed tools; in visually researching their intended use to discover new perspectives and unintended in not only the way we see and represent the world, but the way we understand and represent ourselves in relation to the study of our field.
I remember a time when I was a child, how strange they looked, bandaged up like mittens; looking at my hands and thinking not because it was cold—it was an afternoon in March and my family lived in Florida— but because I couldn’t keep off the playground bars, and they were blistered beyond the usual.

At other times, I’d hang upside down as my face turned redder than the apples on a nearby tree.

I was searching for a new way to look at the world in which I lived.

When I grew a little taller, my mother took me to Sturgis, on the back of her motorcycle.

South Dakota

On that two day ride, I realized the unique perspective of motion; how everything breaks down, how forms merge, outlines soften, and colors blend.

Maybe it was not that things were breaking down, but that they were breaking free—becoming as pure as the engine’s roar, or the beating sun.

I lost sight of this perspective in my adolescent years, although I reclaimed it shortly into my undergraduate study.

I majored in a Graphic Design program that emphasized motion—not solely in the form of animated logos or opening title sequences for films, but on a higher intellectual level, where type and image conveyed more than a message or sold a product.

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Recomposing fragmented words, my sentence read:

"world is this where emotive
patterns and repeated shapes
create meaning from moments in time."

Instead of using a computer to place type into the composition, I animated black twine on a white background to 'multiply' the text over the image footage.

To distort my type, I recorded it through literal filters such as glass bottles and utilized different capturing tools such as scanner wand.

Through these unconventional methods, I discovered that the computer was only a tool, and oftentimes a tool to express the life unable I wanted to instill in my forms of communication.
I believe seeing—particularly the unfamiliar, unnoticed, or new—is a result of physical movements during the design process. Moreover, technology allows the designer to see things differently, perhaps poetically.

I explore these ideas in my work documented here. I believe the representation of motion, and its ability to visualize objects in unfamiliar ways can be enhanced when utilizing digital photographic tools, which in turn change our experience of the world. These tools that put us in motion rather than fix us to a chair, alter our point of view to reveal an unusual vision of the world.
It was Muybridge’s mastery of the camera that allowed for a new understanding of movement. –his understanding of its abilities to freeze time–

Many artists and designers have concerned themselves with expressing something familiar in an unfamiliar way.

By representing the typical as strange, they are able to capture the viewer’s attention for a longer period of time.

For English photographer, Eadweard Muybridge, this occurred not through manipulation or the desire to deliberately make something strange, but simply by exposing what already existed.

With the use of the photographic lens, Muybridge broke down simple movements of humans and animals to reveal imperceptible traits.

In 1872, he made a notable discovery when hired by Leland Stanford (founder of Stanford University) to photograph a horse race.

Stanford placed a bet: all four legs of a horse leave the ground during a trot or gallop.

The horse moved too quickly therefore Muybridge devised a complex photographic system that could slow down the depiction of the horse’s movement.

It revealed, in one frame of the many captured, that indeed all four legs of the animal leave the ground when in a full gallop.

It was Muybridge’s mastery of the camera—his understanding of its abilities to freeze time—that allowed for a new understanding of movement.
By 1922, photographers began to reconsider the potential of the camera. These were not the businessmen who had adopted the title of ‘photographer’—whose primary subjects were images of the bourgeoisie, avant-garde artists, masters of figurative drawing and painting who would—according to philosopher and critic Walter Benjamin—free photography from not only physisocropic, political, and scientific interests, but also from the attempts of the commercial artist to display reality as a beautiful cartoon.¹

This was especially true for Russian artists like Aleksandr Rodchenko whose country pushed for experimentation and instruction over charm and persuasion.² During the 1920’s, Russia entered a period of New Economic Policy, influencing the artistic-social, avant-garde movement known as Constructivism.

Rodchenko achieved this new visual language in his photographs using two formal qualities developed from his experience as a painter: light and composition. The difference between his photographs and his paintings was his choice of perspective. It was through this unfamiliar position that Rodchenko believed man could transfigure his relationship to his environment and society.³

László Moholy-Nagy

They believed it would "train our powers of observation to a higher standard of visual perception," so that citizens might have the divine power to see abstractly, exactly, rapidly, slowly, intensely, and penetratively; so that mankind might transform utopian society.

While Rodchenko photographed unfamiliar points of view, Hungarian painter and photographer László Moholy-Nagy embraced the new visual language of motion. Inspired by industry and the machine, he captured this experience with a machine itself, the camera. This not only includes the process of photographing, but also the placement of the envisioneer to perspectives that were once inaccessible.

As a result, Moholy-Nagy believed the viewer — and ultimately, society— would acquire a new perspective: simultaneous with that of the bird, the frog, and the fish —of magnification, ultra speed, reflection, superimposition, penetration, solarization, and distortion, all brought about by the camera. They believed it would "train our powers of observation to a higher standard of visual perception," so that citizens might have the divine power to see abstractly, exactly, rapidly, slowly, intensely, and penetratively; so that mankind might transform utopian society.

In his book, Vision in Motion, Moholy-Nagy chooses the title not only to discuss the camera's ability to capture motion differently than the way we see it, but also to imply the new form of motion the camera instills in the artist. This idea of "vision in motion" has now evolved from the notion of capturing a subject in motion —and the artist being in motion— to a much larger social movement that occurs from a new visual language brought about by science and technology.
At the turn of the 20th century, this visual change also paralleled with the new developments in literary language. Russian theorist Viktor Shklovsky is credited as the originator of this concept, known as *Ostranenie*, or defamiliarization.

The concept argues for the need to defamiliarize things, which have become over-familiarized, like clichés, so that societies’ visions might be revitalized.

This yielded revolutionary new compositions and foreign perspectives that could influence the individual perceptions within Russia until a new collective emerged with new ideals coinciding with this new policy. This period exemplified a great need for a new visual language, which was implemented by Vladimir Lenin shortly after the Bolshevik revolution.

This period also paralleled with artistic developments, such as cubism, that revolutionized visual language and changed our associations with reality.

A new visual language was created, editing became another tool to take previously presented views into a more immediate, challenging the viewer’s level of participation.

For Lenin, this meant transforming Russian’s people into the ideal Soviet society. During the time of the New Economic Policy, Lenin expressed a great need for a new visual language, as it would influence the individual perceptions within Russia and new collective emerged with new ideals coinciding with this new policy.

For Lenin, this meant transforming Russian’s people into the ideal Soviet society.
In the recent past, newer tools of technology to a higher language, one that would transcend our communication beyond the 'typical.' Such influential 'tools' included television and video games; their newly kinetic forms invaded the printed page and ushered in a new visual language.

This language developed into a communication skill, employed by what David Carson calls the Post-Typographic Person, as opposed to the Typographic Person who developed early communication skills from print media, and then learned electronic media. While television and video games influenced 2D design, digital coding has created a new visual language, kinetic motion one constructed through algorithms to produce random variations.

In this manner of work, the designer utilizes motion to create a message of implied movement, as much as anything on the computer is implied and not actual. Unfortunately, these processes and tools do not conduce movement from the creator, leading to the questionable lifespan of the design.

Current tools seem to only yield implied perspectives.
While the computer improves the lives of many, our existence as humans becomes more static.

For today's designer, simply moving can influence a fresh perspective. I believe other designers realize this.

For designers, the creative process is increasingly more stationary as the computer undermines our physical involvement. They are looking to traditional tools such as the printing press and the silkscreen press to translate the unfamiliarity of their movement into a message.

I argue for designers to stretch their limbs, to seek out newly developed tools that invigorate their process; to work in motion—physically and conceptually. As we become more static sitting in front of a computer, so too will the messages we communicate.

I question if graphic design can survive in a sterile, white studio space dominated by the glow of screens; where, in many cases, it almost feels shameful to use a pencil. I wonder where the actual sketches, the thumbtacks, and the torn scraps of paper go now that they are only implied within the digital space. I question if wrist movements and seat shifting alone inspire big ideas, let alone execute them.

A different perspective is needed for the future of communication. A one that physically activates the designer during the design process within graphic design; and positions them to the unique perspective of their tool.

I believe other designers realize this. For designers, the creative process is increasingly more stationary as the computer undermines our physical involvement. They are looking to traditional tools such as the printing press and the silkscreen press to translate the unfamiliarity of their movement into a message.
While László Moholy-Nagy and Aleksandr Rodchenko are very early precedents in understanding how the motion of a tool can provide an unfamiliar perspective, I exploit present-day tools within my process to defamiliarize forms in motion.

In my second semester of graduate study these tools were the Xerox machine, the VuPoint scanner wand, iPhone apps such as Time Warp and the panorama feature, and, finally, After Effects.

These tools not only capture motion, but influence my motion as the user. The portability of each tool literally granted me new ways to capture images.

Collecting image outcomes from a series of variable problems, I discovered unique aspects about each tool, such as how the scanner wand and Xerox machine can reveal all sides of an object on the same plane; or how the scanner wand can record over extended periods of time.

It was also interesting that these tools similarly required movement during the capturing process – aside from After Effects – and the imperceptible speed of the panorama tool, and the bizarre flow of the scanner wand.

Early experiments with After Effects enhanced the representation of motion.

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I used the scanner wand in one of my first projects in graduate study. The prompt was to trade toolkits with a fellow classmate and make something based off of their kit.

I was given digital images, processes, and guidelines to construct something new.

Because the images supplied were of low resolution, I constructed new compositions on my desktop using the Apple Preview to record high resolution spreads for a print based zine.

Some of these images were .mov or .gif files. Their motion translated into print with the scanner wand generated unusual forms.

Thinking of their motion, I implemented my own movement by capturing them in sweeping gestures, as if attempting to grasp the files literally from the screen.

With the scanner wand, I treated the screen as if it were a sheet of paper. The tool functioned as a ‘viewfinder,’ discovering images my blinded movements couldn’t see through the digital screen.

I titled this Viewfinder because I found an interesting point of view from the given constraints. Unknowingly, this class introduced me to the concepts of Ostranenie.

Starting with this course, my first semester of graduate study became about exploring the potential of all things: of processes, materials, and tools; of dismissing their intended use for something new—or something else that became new—and recognizing the change in the communication that resulted.

I learned to question the perspective of tools: how they were used, the way they represented visual forms, and how they challenged the representation of nature when they were misused.

I discovered the eye of the tool was as rich with potential as my own viewpoint.

Some of these images were .mov or .gif files.
Instead of “on to the next,” it was “one thing leads to another,” which led me to think of process as motion in itself; a morphic continuum of thought that needed to be visualized.

For VCUarts Open Night in December, 2013, I projected my process work in the form of several revolving digital posters that derived from ornate process work—literally changing the position of the viewer.

Presenting this piece in a room limited in space and filled with other student work projected on most surfaces, I chose to place the viewer in a different perspective by building something small that would draw the viewer in.

I enclosed my laptop in a box and had it play the evolving poster series through a peephole, transforming slightly from the previous, piling up only to dissipate.
Interested in changing my own perspective on how I thought about tools and their communication, I enrolled in a Kinetic Imaging class during the summer session between my first and second year. The course focused on traditional animation using atypical processes and tools. For most of the assignments, this meant rethinking what a camera was and how to create animated forms either without it or by misusing it. I saw this as an opportunity to further master the tools I worked with my first year of graduate study: the scanner wand and the Xerox machine as well as tools and apps found on my iPhone. Much like the camera, these tools relied on light to develop an image.

One of the first assignments involved recording a controlled action that resulted in various outcomes or frames for an animation. My action was to repeatedly crack an egg on top of a scanner bed, and then capture it at a very high resolution. This revealed a world of the egg that had been beyond my previous perception. Microscopic universes emerged from the destruction of the shell. If the egg was still intact, it seemed an existence was still uncovered behind the shadow of the breach, one more vast than the space it seemed to contain. At that time, I was really interested in the due date slips found in the backs of library books. I juxtaposed images of these beside the stilled eggs to develop a deeper narrative about seemingly small worlds that don't exist in the everyday. Their surfaces have been affected by use and repetition, leaving cracks between time and space for our imagination to crawl through and explore.
We looked at in this class, I was inspired by Norman McLaren’s process of animation the most. McLaren’s method was improvisational: drawing frame-by-frame with no specific intention—and sometimes, no direction, only to be surprised by the unexpected.

Sometimes we would practice improvisational writing to get us thinking about a topic before we animated it. One of these was to write, then visually respond to the prompt, “I am ____. ”

I chose the word “observing.”

The imagery in my piece consisted of the text “I am” along with a photographic representation of my eye. These three words acted as keyframes while I generated the in-betweens by collaging elements together as if each were morphing into the next.

My process was physical. My hands and glue, as well as with the scanner wand moved across collaged areas to blend these frames through time and light.

I realized then that I was no longer observing with just my eyes, but also through the lens of the tool; both would help to make sense of the perceived world around me.

With my animation projects, I never lost sight of my background as a graphic designer. I continued to think and work with type while generating imagery.

The improvisational writings we completed in every class further helped me to consider the verbal and textual narration behind our prompts. My final piece would often translate into a small book that accompanied my final video.

I also noticed connections between print and motion—mainly how similar keyframes were to individual pages that formed the timeline of the small publications; and if timelines in film can be disjointed or fractured, then so can the timeline of a book.
These new tools have the potential to suspend the laws of nature and how we perceive the movement of dance—how we understand time and the sequence of motion—and inspire us to reflect on our own movement.

I chose his video Pas De Deux as a means to think about the visualization of motion through dance, how narration informs the movement, but also how the tools used to capture this movement influenced a distinct way of visualizing and thinking about motion in time and space.

I recorded a found contemporary dance video on YouTube using the iPhone app, Time Warp, which manipulates recorded time and allows control of things such as ‘scan lines’ and ‘time direction.’ By increasing the number of scan lines, I was able to slow down the capturing of the dancer’s movement, revealing traces of her form from moments before that my own eye or a traditional camera set up could not visualize. With this traced recording, I continued to slow down time by focusing on transitional poses. I would spend time in these moments, moving them back and forth, “1, 2, 1, 2, 1,” before moving onto, “3, 4, 3, 4, 3, 4.”

My piece allowed the viewer to have control over the video's playback, depending on how they chose to scrub through the video: from ending to beginning, beginning to end, or somewhere haphazardly in the middle. From this aspect, I realized I was not only interested in and their inherent new language of motion or my movement during the design process, but the viewer's movement as well in dictating how the message would be received.

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Thesis

After a summer of experimenting with tools, I decided to focus on my thesis topic on the motion of improvisational dance, guided by intuition. I felt there was an important connection between my creative process and that which paired well with the dancer's own internal sequence.

I connected with a first year student—Michelle Koppl—who was studying dance at VCU. In VCU's motion capture room, we recorded an improvisational sequence that utilized her full range of motion within a 6' x 6' space, highlighting unexpected poses and transitions. For this process, I positioned her in an empty room using 10 cameras around the square perimeter to capture her movement from all points of view. Koppl wore a suit with 53 reflective pongs attached at each main joint of the body, functioning as markers for the cameras to recognize. The software program, Blade, records her motion into a black digital space, on top of a white grid. This data would typically be brought into Motion Builder where a computer generated figure with an 'established pelvis' would ‘snap’ to the outline pelvis of Koppl.

Instead of advancing in this direction, I decided to use the recorded data using processes and materials familiar to me as a graphic designer—misusing the system. Depending on where the viewer stands, these sides line up to form a key frame of motion or break apart into fractured representations of in-between frames. I thought of how this exploration would fit into the spatial confines of an exhibition room. The material also addressed the question of how to show simultaneous movements within the same space by utilizing all six frames of the cube. For the viewer to see the full range of motion, they must move through the space from one keyframe to the next in order to realize the full dance in front of them. This visual example is a small scale idea of what the piece would have looked like, using the 30 seconds of found footage from my previous dance video as example imagery.

Project

Reflective pong worn during the motion capture process.
Michelle Koppl getting ready to be recorded in the MC room.

For the majority of the year, I conceived of visualizing this movement using a massive amount of 6” x 6” cubes, depicting the dancer's movement in an essentially three dimensional pixel grid. Reflective pong worn during the motion capture process.
This implied motion of the lines, and the qualities inherent within the object, ironically portrayed a digital motion effect I might have used with technology.
Instead of using a camera to capture the imagery, I recorded the dancer’s movement—start to finish—using the scanner wand.

In the beginning, the process felt somewhat random as I figured out which paths to take across Koppl’s form to generate images that most effectively connected to her motion.

As Koppl slowed her movement down for me to record, I thought quickly about which areas of her body would communicate her poses most clearly.

In doing this, my perspective of her movement had physically—and psychologically—changed.

In this process, I turned my own movement into an improvisational dance around Koppl’s progression, and the scanner wand into a video camera.

The process transitioned from capturing the dancer’s full range of motion, to recording areas of her body that acted much like keyframes to the animation I would later build.

However, seeing the final images in their vertical orientation lead me to believe the blocks were no longer an appropriate surface of communication.

At 18” x 6.5’ per pose, displaying the images as flowing banners felt more appropriate.

The lightness of the dance was transferred to a lightweight fabric and hung from a grid inspired by the motion capture process, I printed keyframes on fabric and suspended them on a gridded lattice, deriving algorithmic points taken from the recorded data in the capture room.

The viewer was able to travel through the piece in a unique sequence, depending upon their path.

The gallery visitor’s movement also influenced the experience of the room, setting the fabric stills into motion, furthering the overall presence of animation in the room.
Both representations differ in their depiction of simultaneity: one feels more scientific—the viewer serving as the observer; the other playing on the imagination of the viewer as they piece together the routine through their participation.

A video recording of the motion captured sequence played on a wall adjacent to the installation.

This functioned as a point of origin, connecting the use of the grid to the placement of the suspended images.

On its own, the video serves as an alternative view of the dance and its full range of motion.

While learning the potential of the Blade program, I discovered ‘marker tracking,’ which reveals past recorded markers during the animation.

With up to 500 past markers viewed, I was able to see the routine from an unanticipated perspective.

Having these two pieces together in one room created a contrast between seeing the dance in motion versus seeing it in print.

Motion capture recording of dance routine.
Evaluating

More concisely, the unfamiliarity of the medium is the unfamiliarity of the message.

When devices such as cellphones and computers have sped up processes of communication—
and allowed us to accomplish things simultaneously, the motion we experience on our screens is an implied motion.

We think we move through time and space far quicker than ever, but all the while,
we are as static as the chair in which we sit.

We’ve often asked myself how movement can afford a sense of unfamiliarity.
As mobility becomes an ever-increasing feature of our lives, are we not more familiar with the vision of motion than ever before?

While devices such as cellphones and computers have sped up processes of communication—
and allowed us to accomplish things simultaneously, the motion we experience on our screens is an implied motion.

More concisely, the unfamiliarity of the medium is the unfamiliarity of the message.

When our tools and our language have become “over-automatized”—
—when we have become “over-automatized,” as Viktor Shklovsky states in his essay Art as Technique—
the individual or viewer functions through formula.

But when presented strangely, as a disordered rhythm,
the communication becomes poetic, actively engaging with the viewer’s imagination.

By working physically as opposed to digitally, a sense of unfamiliarity is introduced into the process that executes the message.

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the individual or viewer functions through formula.

But when presented strangely, as a disordered rhythm,
the communication becomes poetic, actively engaging with the viewer’s imagination.

I, too, work in the same vein: to exploit the language of contemporary devices in order to defamiliarize, actively engaging with the viewer’s imagination.

Exploit the language of contemporary devices in order to defamiliarize, actively engaging with the viewer’s imagination.

This process elevates the viewer’s perception beyond the everyday formula.

This is what Moholy-Nagy and Rodchenko were after when they discovered the camera’s potential for
and what many designers and visual communicators aim to do with new technology.

A new visual language

This process elevates the viewer’s perception beyond the everyday formula.

A new visual language
There is an interesting connection between my thesis topic of the unfamiliarity of motion, and the multi-disciplinary approach to my installation. Instead of statically working in front of the computer, I reached beyond the familiar processes of graphic design and to those belonging to kinetic imaging, sculpture, and, of course, dance.

I believe that with newly developed tools, comes additional roles for the graphic designer.

By understanding the multitude of directions from which we can work, we perceive angles of communication that were once unsought, and portray these atypical perspectives in the hopes of progressing the world beyond how we know it to be.

I believe the structure and layout of this document communicates the poetic language spoken of by Shklovsky. Its ability to fold out as a single piece for viewing presents a timeline of my thoughts and work measured against how long it might take someone to read each page. This measurement is represented as timecode and appears at the beginning of each new section throughout the document.

The use of the timeline is inspired by my interest in recording motion, activate the viewer’s eye, but also formally relate to the shifting layers found in an After Effects project. Seeing the content all at once invites the viewer to read areas that attract the eye, they choose how they’d like to digest the content.

—in a way, compressing time—

With sections of the book able to fold down a different structure of the document is presented atypical to reading it page by page, as if traditionally bound.

This book inspired my own vision in studying the communication of tools that implement motion, such as the camera. On the surface, the title reads as a new vision inspired by the camera. Though, I also interpret it to be about the artist now seeing in motion due to the camera’s portability. Maholy-Nagy elaborates on these notions to include the social impact of new technological tools on the biological sphere of humanity.


I looked to this book to understand the history of instantaneous photography. It describes how photography broke new ground as a medium. It discussed the reactions of people against their traditional understanding of motion represented through forms such as painting, drawing, or printmaking. Prodger makes it easy to grasp how photography transitioned from a scientific, technological advancement, to an artistic medium. He captures the history of Muybridge’s career and personal affairs along with spectacular images of Muybridge’s work.


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I found this book highly inspirational to me, as they encouraged experimentation as a means for the progression of society. The book is highly detailed and thorough in its presentation of the history of motion, and the various technological advancements that have contributed to it. It is a fascinating read that provides a unique perspective on the evolution of motion and its representation in art and science.
I see her as a prime example of a designer exploiting the potential of new tools to create a new visual language for design—one that connects the kinetic spirit of humanity, even if that motion is implied.


When reading about the positive advancements of technology, I admire Postman playing devil’s advocate on the negative consequences of the use of technological tools to express our lives and to be shaped by them.

Postman illustrates a world where culture is undermined by technology, where human life is reduced to machinery. In a way, my thesis aims to avoid this world by using and misusing technology to one’s desire; to break the prescribed method and expand human life beyond the limitations of devices.


“What is the marker of good design? It moves. The story of a successful piece of design begins with the movement of its maker while it is being made, and amplifies by its publishing, moving the work out and around. It then continues in the feeling the work stirs in the audience when they see, use, or contribute to the work, and intensifies as the audience passes it on to others. Design gains value as it moves from hand to hand; context to context; need to need. If all of this movement harmonizes, the work gains a life of its own, and turns into a shared experience that enhances life and inches the world closer to its full potential.”

David Carson is a contemporary example of a designer exploring the unique perspective afforded by the camera’s portability.

His fotografiks challenge the viewer to question the process of their creation.

What seemingly appears to be digital effects within Carson’s work are actually visual opportunities found within his environment.

This idea of seeking new perspectives within my own surroundings has influenced me ever since.

Chimero’s writings were an interesting perspective on the connections between movement and design—from a designer’s perspective as opposed to that of a photographer and a kinetic imager.

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Within this book I discovered April Greiman’s work and her influence on design.

I see her as a prime example of a designer exploiting the potential of new tools to create a new visual language for design—one that connects the kinetic spirit of humanity, even if that motion is implied.


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