Sustainable Cinema: Creating the Moving Image with Natural Power

Abstract:

Sustainable Cinema is a series of kinetic public sculptures that merge natural power with perceptual illusion to create a moving image. The artworks incorporate optical illusion toys that led to the invention of movies with early energy resources. By referencing the histories of both film and industrialization, these sculptures explore a possible future of environmentally responsible media—looking forward by looking back.

Introduction:

As an artist who mixes cinema with emerging technologies, I often focus on the physical properties of generating the moving image. The Book of Film Care, an older publication by Kodak, boasted that their film was ‘animal, vegetable, and mineral’—bragging how all the materials used to make the celluloid of the movie industry came from the natural world (Gordon, 1983). The term ‘silver screen’ derived from the actual embedding of silver into silk fabric, while even earlier shadow puppet shows projected onto opaque animal skin. The history of film began with materials directly from the earth itself. This series of artworks considers alternative systems to create a moving image, as if cinema had
continued to evolve with sustainable elements instead of being influenced by the industrial and digital ages.

**Media Archeology**

Several artists are currently exploring media archaeology in their new media art practice. In a forthcoming paper, media archeologist and scholar Erkki Huhtamo considers the trend. “There seems to be a parallel between the emergence of the archeological art and some changes taking place in the cultural and intellectual ambience. The general framework seems to be the gradual displacement of the 1980's postmodernist discourse in favour of an approach which once again seeks foothold in "real" space and time….I see the activity of this gaze as an attempt to go beyond postmodernism, to initiate a dialogue with the past with the aim of countering the constant blurring of boundaries and definitions which is characteristic of the "postmodern condition" and largely a product of the spreading of audiovisuality.” (Huhtamo, 2010)

This spreading audiovisuality means that we are surrounded by screens, yet rarely understand the technology behind them; few people could explain how a movie appears on an iPhone. These sculptures offer a moment where the mystery of the moving image can be grasped. They are simple illusions created with simple energy to make us reflect on how removed we are from the original magic of the moving image. It is a primal media experience, which, due to the rapid development of cinema technologies, is no longer an oxymoron.

Additionally, the source of their power changes the effect of the moving image in the sculptures. These machines very directly and very visibly capture the energy of the earth, making the animations seem to be channeling a life force. While part of the intrigue comes from the automaton element intrinsic in the work, the natural power used acts as a voice for the living earth. While this may sound faux-mystical, it cannot be denied that the green energy adds to the feeling of actual life in the moving images created.

**Environmental and Sustainable Concerns**

An irony of the green energy movement is that the oldest energy forms—wind, water—are considered new replacements for more recently developed ones like oil and coal. Sustainable energy is a re-imagining of the old, and these works aspire to do the same by re-imagining early cinema systems.

Additionally, by being designed for public spaces, they are meant to stimulate general awareness and conversation about sustainable development. The cinematic elements first entertain and then inform the public about the fundamentals of sustainable design. The sculpture takes the abstract principles of sustainable energy and makes them tangible; by simplifying the processes, it becomes more accessible.
This engagement between sculpture and ecological processes began most fervently during the Earthworks or Land Art movement that gained momentum in the 1960’s. Robert Smithson wrote that “by excluding technological processes from the making of art, we began to discover other processes of a more fundamental order.” Using natural energy in artmaking is a strategy that inherently makes the piece more elemental.

The direct integration of nature into an artwork forces a reconsideration of both nature and culture. In her essay on ecology, Kate Soper closes with “What is really needed, one might argue, is not so much new forms of awe and reverence of nature, but rather to extend to it some of the more painful forms of concern we have for ourselves. The sense of rupture and distance which has been encouraged by secular rationality may be better overcome, not by worshipping this nature that is ‘other’ to humanity, but through a process of re-sensitization to our combined separation from it and dependence upon it.”

The Sculptures

Figure 2: The Image Mill during ArtPrize, The Gerald R. Ford Presidential Museum, 2009.

Sustainable Cinema No. 1: The Image Mill

The first completed sculpture uses the force and beauty of falling water as the energy to create a moving picture. As water falls over the 4-meter wheel, a transmission assembly causes two disks to spin in opposite directions. On the interior wheel are a series of animation frames painted onto glass; on the black outside wheel, rotating in the opposite direction, are cut slits. As the two wheels
spin, the slits act as a shutter and the animation becomes visible…a movie plays in the falling water.

One of the first movies created was a galloping horse and this piece also uses it as a metaphor for the Michigan auto industry. The ‘horsepower’ that drove the state's industrial age is at a transition to a new age of alternative energy…the pony stumbles, but continues on. This theme was also revealed in the fabrication. Made by Michigan metal workers, the artwork proves that the skills of industrial-era tradesmen can be tapped as a valuable resource as the region considers new sustainable directions.

The artwork was installed at The Gerald R. Ford Presidential Museum in Grand Rapids, Michigan in both September 2009 and again in June 2010 due to public demand. It won the Sustainability Award in the inaugural ArtPrize International Competition.

**Sustainable Cinema No. 2: Rickshaw Cinema**

The crudely chopped bikes seen throughout Southeast Asia combine found metals, recycled wood, concrete and other cheap materials to create a hybrid ‘hack’ that assists a struggling family to better their lives. In this piece, a regional bicycle is mechanically re-engineered so that its pedals both generate the electricity and advance the celluloid film to project a film on a coarsely made screen that folds up in front of the handlebars. The sculpture references the vernacular of Asian mobile small-scale businesses to celebrate the folk beauty, ingenuity and compelling history of these machines.
In the early 20th century, over 3,000 rickshaws were in use in Hong Kong and were key to the urban development of the region (“Rickshaw” 2011). Automobiles replaced the technology but this artwork hopes to make the public consider low carbon solutions to transportation again. The recycling and redesign of bicycles to build simple systems to help facilitate the work of small-scale, self-sustainable projects is receiving global attention. This sculpture explores sustainable transportation as part of sustainable development: Tradition as a starting point for a greener future.

Additionally, the project offers unique opportunities in its exploration of an unusual haptic interface for interactivity – the feet and legs of the ‘user’. A metaphoric connection to the journey of film as well as the journey of technological developments in society, using a transportation mode as a tool for interaction has complex and rich implications.

**Sustainable Cinema No. 3: The Praxinoscope Windmill**

The third sculpture is a windmill that spins a beveled mirror at ground level to create the optical illusion of motion. A gear system on top powers the spinning of a cone-shaped mirror at the base that reflects a disk of animation frames rotating directly above it. Using wind as the power and a tower structure that references futuristic 19th Century innovation and design (the Praxinoscope and the Eiffel Tower occurred at the same time in history), the simple animation is completely controlled by the speed and direction of the wind.

![Figure 4: Artist Rendering of Praxinoscope Windmill](image)
In this wind-powered shadow puppet show, the silhouettes are achieved by light penetrating a translucent screen. The rotation of the windmill powers the backlight for the presentation as well as turns a series of gears and plates that animate the puppets and move a background diorama to create a one-minute shadow theatre performance.

Unlike the other sustainable cinema systems that are ‘players’, this sculpture required a commitment to the animation at the onset—the story determines the movement of the gear system which determines the structural design. Dozens of stories were considered involving leaves, balloons, kites, blown hats, windmills, trees, clouds, butterflies, birds, and flickering flames. In the end, a simple metaphor of a seed in flight searching for ground to grow was selected.
Sustainable Cinema No. 5: The Phenakistoscope Windmill

The fifth sculpture is a dual-blade windmill system where one blade acts as a shutter by overlapping the other blade containing animation frames. In this artwork, the front windmill fan is black, the rear contains 18 frames of animation. As the wind spins the two blades, the film is visible in the intersection of the two fans.

Closing

Media is rarely discussed in terms of sustainable development despite that it is a major draw on global resources. When working with the engineers who have also been involved in the realization of these concepts, I often described them as “machines that make people think” to solve the communication issue with a technical team that needed a finite goal or purpose in the design process. Art as a system still often causes consternation, but framing the pieces as “idea generating machines” assisted in our dialogue. As the fabrication plans for each of these sculptures were completed, I had personally experienced the better understanding of a machine that powers on to force contemplation. These sculptures use sustainable energy in a visible, understandable and startling way—to generate the moving image—and hope to initiate enduring conversations about the environment.
List of Figures

Figure 1: “The Image Mill” at night, Gerald R. Ford Presidential Museum, Grand Rapids, Michigan, 2010, collection of the artist, used by permission

Figure 2: “The Image Mill” during ArtPrize, Gerald R. Ford Presidential Museum, Grand Rapids, Michigan, 2009, collection of the artist, used by permission

Figure 3: Solidworks rendering of “Rickshaw Cinema,” 2010, collection of the artist, used by permission

Figure 4: Artist rendering of “Praxinoscope Windmill”, 2010, collection of the artist, used by permission

Figure 5: Artist rendering of “Shadow Play”, 2010, collection of the artist, used by permission

Figure 6: Solidworks rendering of “Phenakistoscope Windmill”, 2010, collection of the artist, used by permission

Figure 7: Artist rendering of “Phenakistoscope Windmill”, 2010, collection of the artist, used by permission

References


