The State University of New York:

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Curriculum in Transition

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The Impact of Technology on Art and Art on Technology: A College Course Design

by

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When I first came to SUNY Maritime College — a college specializing in maritime engineering, science, and business located on the eastern edge of the Bronx on Long Island Sound — I saw that the Department of Humanities and the Science and Engineering buildings were at opposite ends of the campus. In fact, the humanists and technologists seemed to have little in common. The campus itself was intersected by the looming Throg’s Neck Bridge, which further divided what C.P. Snow has called the “Two Cultures.”

It seemed clear to me that one of my tasks as an art educator was to help close the gap between art and technology — two realms that are often considered opposed to each other. Artists are said to cherish spontaneity, personal expression, lack of boundaries, while technologists value order, impersonal objectivity, and the bounds of rationality. Yet a college course on Art and Technology, if carefully structured, could go far to illuminate areas where the “Two Cultures” profitably interact and have a beneficial impact on each other.

The course I ultimately designed looks first at the impact of new technologies on architecture, design, and the fine arts. New technologies have provided new materials — including plastics, steel, concrete, neon, electronics, lasers, video — and new structural techniques which have dramatically altered the appearance of both art and design. Modern technology has also provided a machine aesthetic which, in the guise of Modernism, has until recently dominated twentieth-century design.

The course also focuses on the impact of art on technology. Artists and designers have sought to tame technology, making it more humane and less destructive. Artists have designed more humane housing, and provided postmodern alternatives to the impersonal machine aesthetic of the international style. Artists have presented vivid pictorial and sculptural images of technology’s social impact during the past two centuries. Their works have shown admiring as well as alarming perspectives on the machines that have shaped our urban environments and psyches as well. Recent art focuses on ways to accommodate technology while also further humanizing it. Cybernetic sculptures, as an example, represent sculptural machines that respond with sensitivity to human viewers.

The purpose of the course on Art and Technology is twofold: it increases students’ awareness of how technology has shaped the style and content of art, and it reveals the ways artists have sought to transform technology and explore its creative potential. Students also gain technological literacy — they become more conscious of the social
and ethical implications of modern technology. They can begin to take a more informed view of their own research and technological decision-making.

The first major course topic is the impact of new industrial materials such as steel and reinforced concrete on modern design and building structure. The evolution of skyscraper design is traced from Louis Sullivan's "Form Follows Function" dictum of the Wainwright Building, St. Louis (1890) through the glass-and-steel austerity of The Bauhaus (1929), Modernist Mies van der Rohe's and Philip Johnson's Seagram Building (1958), and more recent examples including Edward Larrabee Barnes's IBM Building in New York and the Xerox Building in Chicago. The uses of molded concrete to create biomorphic, expressive forms are seen in the structures of Le Corbusier and Saarinen. The efficiency of concrete is found in Le Corbusier's public housing structures — his "Machines for Living." More recently, fiberglass and Teflon have provided new possibilities for lightweight tent structures used as giant sports stadiums and shopping centers.

Not only has industry provided new materials for artists and designers, but it also provided the inspiration for the machine aesthetic. The course traces efforts by architects and designers to find a style for an industrialized society. During the nineteenth-century, industrial designers and architects often insisted on maintaining a traditional, historicized aesthetic, even while using new industrial materials and structural techniques. Newly-designed factory beam engines of the 1840s were often encased in cast iron frames, decorated somewhat incongruously with Classical Doric columns or Gothic arches. New machine-made cast iron furniture was covered with ornate rococo decoration. Though Louis Sullivan utilized new steel-frame construction in building the Wainwright Building, he covered the new technology with heavy masonry and ornate decoration. By continuing to use historical forms, designers attempted to keep a sense of continuity, order, and dignity amidst rapid industrialization and technological changes.

Increasingly, though, early twentieth-century designers began to emulate the spare, clean, unornamented designs of modern industry and machines, as seen in the industrial products of the German Werkbund and the Bauhaus. Today's High Tech and Soft Tech designs continue the machine aesthetic, as do the Late Modern buildings of architects Richard Meier and Japan's Arata Isozaki with their use of concrete forms and gleaming machine-like facades.

Today's postmodern architects and designers tend to reject the modernist machine aesthetic. They seek to humanize technology and alleviate the sterile look of Modernism. The course considers the work of architects Robert Venturi, Michael Graves, Charles Moore and others who have resisted the machine aesthetic of international style architecture, which they criticize as cold and cut off from its historic roots. Postmodernists have urged a return to historical ornament, made playful, ironic references to past styles, and paid tribute to popular culture as a way to make architecture more humane. Philip Johnson's A.T. and T. building alludes to Brunelleschi's Renaissance Pazzi Chapel and American Chippendale Furniture. Charles Moore's Piazza d'Italia in New Orleans (1978) makes witty uses of classical design and modern technology. Ionic order columns have capitals with stainless steel volutes, and a new "Delicatessen Order" is outlined with neon lights.

Today's product designers are also attempting to humanize or domesticate new technologies: oversized home video screens and personal computer equipment are incorporated into earth-tone home settings; postmodern furniture by Robert Venturi and
the Memphis designers in Milan turn chairs into historical parodies or playful geometric Pop Art sculptures; plumbing manufacturers are humanizing their austere, industrially-produced bathroom fixtures, placing them in settings with such fanciful names as “Heritage Retreat” where porcelain tubs are encased in knotty pine and endowed with “colonial charm.”

Technology has also had a major impact on the fine arts, providing new imagery and new media for creative projects. Twentieth-century sculptors have explored the uses of a wide range of materials. Duane Hanson’s polyester resin and fiberglass figures such as Tourists (1970) have an uncanny and disconcerting trompe l’oeil reality. Neon lights have shaped the sculptures of Don Flavin and been transformed by Cryss in Ampersand into a flashing, repetitive satire of mass-culture’s duplications. Laser beams directed towards the sky have allowed New York’s Daniel Infante to “write” colored images on clouds. Stainless steel and welded industrial metals have provided a rugged new sculptural idiom for sculptors such as David Smith and Anthony Caro. Electronic motors have given artists the means to propel kinetic sculptures, and have been put to imaginative use in drawing on solar energy for power. For example, Primi-genesis, by sculptors Williams Severson and Saunders Schulz, is a 25 foot stainless steel sculpture which transforms solar energy into electricity, which helps rotate the massive sculpture in the sunlight.

Electronic equipment has helped extend the boundaries of art in other exciting and challenging ways. New Wave performance artist Laurie Anderson relies on electronic sound equipment, including harmonizers and amplifiers, to turn her body into an instrument: her voice is strangely lowered and multiplied, and her head tapped to create unearthly tones. Anderson’s use of technology — including telephone answering machines, video imagery, and computer print-outs — inform her ironic commentaries on the ways technology molds and filters our experiences, alters our perceptions, blocks and extends our ability to communicate and make contact.

Video, film, and computer-generated graphics have also provided new materials and tools for artists’ commentaries on technology. The video experiments of Nam June Paik and Stan Vanderbeek provide witty and surreal views of our contemporary cultural environment. Using computers creatively, computer artists David Whitney and Nancy Burson, among others, have fused computer and photographic images, creating odd hybrids and new variations on the human image.

Technology has also prompted a shift in art iconography as artists have weighed the impact of industrialization and machines on the human psyche and society. The course looks closely at the wide range of artists’ responses to technology — responses which have included admiration, anxiety, optimism and despair. Artists at the beginning of the industrial revolution showed fears of factory explosions (cf. Explosion and Fire at Shiffna (1821), yet by the end of the century their art reflected the country’s explosive excitement at the new technological marvels. A contemporary print showing the inauguration of the Brooklyn Bridge (1883) emphasizes the thrill at engineering expertise, as the bridge is illuminated by bright lights and the explosions of celebratory firecrackers.

Yet artists’ anxieties about explosive machines were never quelled. Satirizing the deadly capabilities of the nuclear bomb, Jean Tinguely on March 17, 1960 set in motion his sculpture Homage to New York (Self-Destroying Machine) in the courtyard of New York’s Museum of Modern Art. After running for 30 minutes, the sculpture made of rusty old machine parts, an addressograph and a piano, set itself on fire with
gasoline, a fitting emblem of a technological death wish.

Other artists have shown the exciting achievements of the machine age. Relishing the "dynamism" of speeding automobiles, the Italian Futurists at the beginning of this century painted abstracted, overlapping images of the automobile moving forward in time and space. In their bright abstract canvases filled with swirling synchronous colors, French artists Robert and Sonia Delaunay delighted in the dazzle of electric lights, whirling airplane propellers, and magnificent feats of modern engineering such as the Eiffel Tower. America's Joseph Stella, in his geometric abstractions, championed the Brooklyn Bridge as a national icon, lending a worshipful, religious aura to the structure. Precisionist painters Charles Sheeler and Charles Demuth represented industrial structures as pristine monuments in a timeless, immaculate industrial landscape (cf. Rolling Power).

Yet artists have also feared that technology not only expands human capabilities but also has a dehumanizing impact. Honore Daumier's nineteenth-century lithographs satirized the trials of railroad travel where hapless riders were seen being jostled and thrown into the air. Sick passengers were told to wait, for the rushing train stopped for no one.

During the twentieth century, French artist Fernand Leger presented good-humored paintings of machine-like tubular human figures painted metallic grey, yet other artists took a dim view of the prospect of mechanized humans. German artist George Grosz, in an untitled 1920 work, painted mass industrial man as a solitary human figure — faceless and armless — standing anonymously near factory buildings, his identity lost amidst depersonalizing machines. Ernest Trova's polished chrome sculptures — his faceless cyborgs of the 1960s — are attached to automobile wheels and pacemakers, reflecting our increasing dependence on supposedly servant machines.

Twentieth-century artists have focused on modern technologies which not only dehumanize us but are also cruelly aimed at destroying humanity. Their paintings decry the malevolent military uses of war machines and the numbing psychological effects of using sophisticated weaponry. Picasso's celebrated painting Guernica (1937), with its stark black, white and grey angular geometries and screaming faces of victims, represented the artist's anguished protest against a German air bombing of Spanish civilians. Thirty years later, the pop art of Roy Lichtenstein charted with cool irony the dangers of modern military aircraft. Lichtenstein's painting Whaam! (1963) took a sardonic look at the way technology deadens consciousness, producing pilots who are detached from their act of killing. Two enlarged cartoon panels show a flyer hitting a target while the word "Whaam!" appears in splashy color, reducing the fact of death and destruction to a flattened, two-dimensional, neutral splat. The comic strip pilot's words suggest he sees High Tech killing as a glamorous adventure: "I pressed the fire control... and ahead of me rockets blazed through the sky."

The two perspectives of the life-enhancing and life-destroying aspects of modern technology have appeared in art throughout the twentieth century. Increasingly, artists are warning of an apocalyptic nuclear catastrophe; the extreme example of technology's threat to humanity. Yet, although artists have presented dramatic images of technology's tendency to dehumanize man and create emotional lives that are cold and mechanized, art of this century has also offered avenues for coming to terms with the machine. The course concludes by considering ways artists have attempted to humanize technology through creative collaborations between artists and engineers. Cybernetic or feedback sculptures represent a new breed of art aimed at producing sculptural
machines that are sensitive to the natural and human environment. Using small electronic motors, computers, and sensing devices, these works are designed to respond to human touch, proximity and sound. While artists have charted the ways technology can numb human sensitivities, the creators of cybernetic sculptures are intent on helping participants increase their ability to feel and perceive. Viewers coming in contact with these sculptures may experience an increased self-awareness and a heightened sense of their own individuality. In this respect, cybernetic sculptures not only humanize machines but spectators too.

A wide variety of viewer-responsive sculptures have been produced, beginning with a burst of creative experimentation in the 1960s and 1970s. At M.I.T.'s Center of Advanced Visual Studies, artists such as Alexano Sima have created *Touch Bulb* (1976), a glass bulb filled with electrically charged neon and argon gases that create mesmerizing kinetic light patterns when touched. *Heart Beats Dust* (1968), by artist Jean Dupuy and engineer Ralph Martel, was an award-winning cybernetic sculpture in a competition sponsored by Experiments in Art and Technology, and New York's Museum of Modern Art for MOMA's exhibition, "The Machine," held in 1968. Dust particles enclosed in a glass cube were activated by the acoustic vibrations produced by amplifying the sound of a participant's heart beat. A high intensity light beam shining into the cube's interior illuminated the resulting patterns of particles, providing a very intimate and creative connection between the human body and technology.

Other cybernetic mixed-media works have helped transform participants into modest musical composers and video stars. Liz Phillips' installation, *Sunspots* (1981), exhibited at the Neuberger Museum's Soundings Show, used a stereo amplifier, loudspeakers, and light sensors to generate a unique sound environment. As spectators moved into the room, their actions produced a random series of musical tones, creating a one-of-a-kind sound sculpture. Les Levine's *Contact* (1969) invited participants to stand in front of a series of video monitors encased in a large sculptural box. Reflecting on their own video images in a variety of monochromatic colors, viewers experienced a heightened sense of self-awareness as they themselves were transformed by technology into works of art.

Examining cybernetic sculptures and the wide range of art works reflecting the impact of technology, students in the course ultimately come to recognize that modern technologies have the potential to diminish as well as to heighten our humanity. Today's art continues to present forceful images of foreboding and hope. Artists vehemently denounce the possibility of technological catastrophe, yet also devote their creative energies to converting our destructive technologies into more life-affirming impulses. The effort to tame technology through art goes on.
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