Creative Interlocutor and Multimedia Dialog

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This chapter will serve as the Introduction of a forthcoming book by the authors entitled *In the Realm of the Circuit.*

Learned American society is formed by these post-revolutionary times, where the computer has created profound new ways of interacting, thinking, and doing. The digital computer and its accompanying methodologies recreate modes of working which stress relationships between bodies of knowledge and human minds. This technology is most valuable in its ability to allow us to reconceptualize our relation to knowledge, and to organize it, rather than allowing us to merely accumulate or dominate information.

Human expression is nondisciplinary by nature. Disciplines exist only because of boundaries which are artificially imposed by the academy. The goal of the arts is to help us understand the commonality between fields, not to reinforce the boundaries. They have always fostered man's ability to think, to search for the commonality of knowledge, and to ponder his relationship to the whole of existence. The great achievements of mankind lie in our quest to expose the unseen. The computer is an embodiment of our cultural desire to move forward. If approached openly by designers who hold the humanist traditions dear, computers allow a means for creativity which will enable us to reinforce that which makes us human.

We see the designer not as a sole individual, reinventing the forms of our commerce in a tangible commodity. Rather, this creative individual is one bred not by a single discipline, but rather by the ability to engage us as a community to redefine boundaries of discourse, facilitating the better management of our great accumulated knowledge.

The creative interlocutor is a designer who facilitates the exchange of ideas and information between one human need and another. This person is the producer, the director, the organizer. Specifically, this is the curator, editor, and collector, then the maker, weaver, welder, builder, and distributor. The computer is the cathedral of the creative interlocutor.

Dataset: All Art Is Image

> When we seek to fix a fantasy or a dream, the results are representational.
>
> Laszlo Moholy-Nagy [1]

> The activity of art is based on the fact that a man receiving through his sense of hearing or sight another man's expression of feeling is capable of experiencing the emotion which moved the man who expressed it.
>
> Leo Tolstoy [2]

Throughout the history of human existence, we have attempted to communicate with one another. Whether this communication has taken the form of vocal utterances, ink on paper, or modulation of radio waves; the intention always has been the transfer of meaning from one individual to another to create an image which will convey an idea. Perhaps our first network was the Greek foot messenger, who gave greater meaning to his message by conveying it from one person to another. It is in our humanism that we attempt to make manifest some facet of experience/content, and communicate it to another person or persons.[3]

Up until now, the medium has determined both the audience for the message and its destination. Thus, oil paintings were destined for the museum, text for the printed page, and music for the radio. Subcultures have grown up around these destinations, and these subcultures have become insular and self-referential. Yet, the separations are artificial, imposed by the restraints of the technology and of the vision of those working within those fields. With its virtual writing space,[4] the computer allows us to transcend these restraints, and to reunite all experience within its algorithms, to recognize the common humanism within all communication.

All representation and communication, no matter how it is physically designed, is a means for human expression. The digital computer; when combined with the optical scanner, the music sampler, and a myriad of other computer input devices; allows us to reduce all physical media to a virtual binary digit. At this point, when we have digitized sound, or photographs, or film—it is all equal in the memory of the computer—it is a dataset. A dataset is merely a sequence of numbers; nothing more, nothing less. Every digital movie, every digital image, and every digital sound is nothing more than a sequence of zeros and ones stored in the memory of the computer. These numbers now can be seamlessly combined and juxtaposed. In the computer's virtual spaces, all forms of communication are equal.

The computer, in its use of multimedia, merely is reinforcing common and historic human themes. To communicate in the interest of evolving the human condition, there must be a commonality

1 Laszlo Moholy-Nagy, *Vision in Motion* (Chicago: Hillison & Etten Company, 1961), 15.

2 Leo Tolstoy, *What Is Art* translated by Louise and Aylmer Maude (London: Oxford University Press, 1930), 171–3.

3 "As a photographer, I don't care about photography, and have always held those who are concerned exclusively with f-stop and stop bath with disdain. For me, it is the communication of idea to another which holds the true excitement. Photography is merely a means to an end, and if I could achieve that end in another way, I certainly would." Jonathan Lipkin, *One Family's Journey*, MFA Thesis, (1993).

4 Jay Bolter, *Writing Spaces* (Hillsdale: Lawrence Erlbaum Associates, 1995). Here, Bolter traces the history of the effects of technology on writing. He discusses the book, the scroll, and pictographic and logographic alphabets. The computer is seen merely as the next step in a long series of technological advances which interact with the culture of the time.

in the design endeavor which makes this possible. Unfortunately, in recent history, various forces—commercial media, academic disciplines, and design and art elitists—have attempted to divide and categorize this endeavor for the personal gain of those who are endowed with power. The ability of the computer to reduce all communication to a common level implied within the dataset and to reorganize the message in new administrative way should be empowering the individual to further the social good.

Humanism and the Liberal Arts

The computer has value only as it enhances that which makes us human; our ability to learn or, rather, to learn how to learn—the knack to order, manage, and reconfigure that which we know. Our humanity lies in our ability to transmit from one to another, allowing others to gain access to successful formulations and articulations which further our notion of being. This is what builds culture—the accumulated conceptual riches brought through the history of civilization.

The liberal arts ideal treats the fields of knowledge in a balanced and equal manner in the cause of furthering our humanity. In the study of these arts, emphasis is placed on the commonality of human experience and thinking, while the differences between fields of knowledge are de-emphasized. The liberal arts attempt to weave meaning through our study to find patterns for our enlightenment.

Since the Renaissance and its enlightenment, the core of this traditional education held that all areas of human endeavor are suitable topics for inquiry, regardless of their nominal concerns. An integrated individual versed in the liberal arts loves learning and is directed by intellectual curiosity rather than by disciplinary guidelines.

The Renaissance dawn from the *a priori* methods of the Dark Ages revealed the various facets of diverse fields and the common rays of humanism's enlightenment. Educators such as Vittorino da Feltre of Mantua taught men to be well rounded individuals. In his boarding schools, princes, and poor scholars mixed in a classical education. Character was shaped, along with mind and body, through frugal living, self-discipline, and a high sense of social obligation. All was done with an eye to the practical: philosophy was a guide to the art of living, along with training for public life. "Students were expected to excel in all human existence." [5]

Renaissance worldliness challenged the hermetic doctrine of the Church without quelling its spiritual quest. Such is the great genius of Leonardo, Copernicus, and Bacon; to name but a few of the obvious. For our interest here, Francis Bacon serves as a model of the interlocutor who connects the spirit of the Enlightenment with the great age of reason following the Renaissance. Through his methodology of inductive reasoning, he sought to free intelligence

5 Dennis Max Smith, *The Renaissance* (New York: American Heritage Publishing, 1961), 322.

from dogma which constrains and limits us from understanding the greater rational scheme of the world. In *Novum Organu* in 1623, he argues not only for scientific methodology, but for the arts and the humanities to accompany it. His inductive reasoning—the search for pattern in accumulated information—lays the groundwork for the commonality of procedures which would dispel the notions of *a priori* knowledge. His philosophies opened the field of human inquiry to an ever-expanding body of knowledge. Francis Bacon's life rooted in philosophy, politics, and the creative art of writing is exemplary of methodological inquiry furthering the connectedness of our human interest.

Maria Sibylla Merian[6] (1647–1717) was the visual arts analogue to Bacon. Through her use of evolving technologies such as optical magnification and mechanical reproduction, she was able to further humanist values and the ideals of the enlightenment. Born to a family of bookmakers, she began, at an early age, to observe and sketch insects. She would use the skills learned as a child to publish two major works: *Raupen* and *Metamorphosis*, both editions of copperplate prints. In these works, she depicts the insect and plant life of Europe and Surinam in terms of the emerging intellectual class of the period. Merian was unique among botanists of her age. She depicted insects and plants not as specimens, but rather as intricately and intimately involved in the cycle of life. She was not interested in then common conventional classification schemes or in cabinets of wonder which presented sterile specimens. (In fact, she told one potential collaborator to stop sending her dead insects—she was only interested in "the formation, propagation, and metamorphosis of creatures."[7])

Merian was inspired by the new optical technology of her time. The past century had seen a renewed interest in observation—the compound microscope had been invented in the 1660s, and Athanasius Kircher published his book, *Ars manga lucis et ubmrae* in 1649,[8] in which he discussed the "camera obscura" as a tool for observation and illustration. In her imaginative use of these tools, Merian was an artist who responded to enlightenment discourse about knowledge and the natural world. No longer drawn *a priori*, knowledge was created through empirical observation.

Ironically, the fruits of scientific methodology fathered by Bacon nurtured other great transdisciplinary thinkers such as Thomas Jefferson and Benjamin Franklin while, at the same time, creating further specialization of discourse. Yet, the same methodologies produced more specialization as the nineteenth century expanded the fields of knowledge. But even in this dawn of specialization, the creative interlocutor can be found. Samuel F.B. Morse, Liberal Arts student at Yale University, a renowned painter and founder of the national academy of design enabled a great leap in human communication.[9] He had always been fascinated by Franklin, and upon hearing a fellow passenger on a steamboat remark

6 Natalie Zemon Davis, *Women on the Margins* (Cambridge: Harvard University Press, 1995).

7 Ibid., 181.

8 Martin Kemp, *The Science of Art* (New Haven: Yale, 1990) and Jonathan Crary, *Techniques of the Observer* (Cambridge: MIT Press, 1994).

9 Wade Rowland, *The Spirit of the Web* (Toronto: Sommerville House, 1997), 54.

that electricity could pass instantaneously through a length of wire, Morse excitedly replied: "If this be so, and the presence of electricity can be made visible in any part of the circuit… intelligence may be instantaneously transmitted by electricity to any distance." The rest is history. Morse, who had practically no knowledge of engineering or electromagnetism, enlisted the help of those who did to pursue his great invention of the telegraph. Morse's brilliance lay in his equation of electricity with intelligence, and of the visual as a bridge between the physical and electric.

Cross Fertilization

The idea that one field might enrich another is not a new one: the concept and practice of what currently is termed multimedia is an age-old notion. Multimedia is not suggested merely by technological advancement, but rather it is grounded in fundamental human practice which predates the invention of the computer by thousands of years. Multimedia's early uses were cross disciplinary without knowing it—the modern day boundaries between the fields had not yet been erected. The advent of the computer did not create multimedia, but rather manifests a preexisting need in a more democratic and universal way.

We can see multimedia in the burial rituals of the ancient Egyptians, who made no demarcation between media employed in the great technology of the pyramids and their elaborate burial rituals. These burial sites combined elements of architecture, writing, sculpture, and during the rite, even music and performance—all for the purpose of captivating and mystifying the laity under the dominance of their rulers.

In the Middle Ages, the prevalent form of multimedia was, at the same time, a form of mass communication. The cathedral communicated the awe-inspiring Christian spiritual doctrine, which was the dominant means of rationalizing human existence. The message was made stronger by its embodiment in a variety of media stimulating the senses: visual (stained glass and statues), sound (music and hymn), touch and taste (performance and mass), and smell (incense such as myrrh). Writing itself was the means for codifying the knowledge held in the cathedral, the knowledge to sort out the patterns of our existence, and to know the unknowable. This was a highly specialized technology whose use remained solely the property of the power elite.

As a mass communications device, the cathedral had several limitations. The first was the expense and duration of construction, which often spanned many decades. The second was its limited mobility—its defined space which confined its reach to those capable of traveling to it. Due to these inherent and, perhaps, intentional constraints, knowledge, and thus power, were concentrated in the hands of the theocracy. It was not until the advent of the printed book that knowledge could be more easily distributed.

Victor Hugo wrote of the conflict between the cathedral and the book in his novel *The Hunchback of Notre Dame.* A character in his novel, a priest in fifteenth century France, compares the newly invented book to the cathedral and states "this will kill that"—the book will kill the cathedral. Yet it did not. People continue to go to church, and the cathedral is still a site for multimedia presentations. The printed book allowed for the democratic distribution of information and knowledge, and thus spurred inquiry which reached beyond the hermetic doctrine of the church.

Hugo's phrase refers to the to the conflict between the text of the book and the imagery of the church. In this case, the book and its textual mode of representation were triumphant over the multimodal imagery of the church. For centuries to follow, the word, through the great dissemination of the written text by means of the printing press, was the primary source of creative inspiration. In the twentieth century, Marshall McLuhan, in his book *The Gutenberg Galaxy*, foresaw the rise of the image, empowered by global visual media such as television. He envisioned "the civilization of imagery," wherein the word is no longer the sole stimulating force to the imagination. Italo Calvino notes that, at the millennium juncture, there is an unanswerable conundrum, much like the chicken and the egg question. Which stimulates the imagination first, the word or the image?

From the beginning of Western civilization, we find resistance to new technology; Plato, in the dialog *Phaedrus*, questioned the value of the written word. The phrase "this will kill that" was repeated with the invention of photography, and all too often is heard again today as we experience the digital revolution. Much in the same way that the text of the book threatened the multimodal cathedral, or photography's imagery that of painting, the nonlinear and multimedia computer now threatens the book. Most likely, there will be a coexistence in the media. The book will probably not disappear, but will inevitably change in function and meaning, much as painting did after the introduction of photography. Furthermore, the computer and cyberspace offer us a new renaissance in our extensions of creative possibilities through the coequal distribution and interconnectedness of multimedia.

Flawed Development

Generally, it is true that programming and the design of the tools of our industry, whether public or personal, are based upon the procedures, strategies, and metaphors that are ingrained in the engineering and marketing worlds. It is rare that the design of a tool is based on the vision of the artist, historian, or humanist. As a result, users have to adapt their practice to the constraints embedded and implied by the existing parameters of engineering. However, when this model is not followed, and when innovative minds collaborate with technology developers, great things can happen.[10] Conversely,

10 Douglas Ingber, "The Architecture of Life" *Scientific American* (January 1998): 48–57. Available at http://www.sciam.com/1998/0198issue/0198ingber.html

artists often are uninformed about the basic scientific principles which drive the engines of our culture. It is an exceptional artist who is educated in physics or mathematics.

For too long, the creative community has labored under the impression that technology's promise owes us something. This limiting expectation has left us disappointed again and again. We expect the digital world to deliver itself packaged with ease of access, adapted to our every whim, and sympathetic to our psychological complexity. Humanists approach the technology tentatively because they have not seen their role in its development. We must create that role for ourselves. Ask not what the computer can do, but what you can do for the computer.[11]

Few enlightened people fear sweeping technological advances in medical science, where a kind of creative interlocutor working with groups and networks of other researchers is commonplace. Yet these same individuals turn into raving Luddites when presented with advances in information and imaging technology, even those so commonplace as word processing or the Internet. Perhaps this reaction results from the perception that medical science always has had the express purpose of serving human needs. Ironically, we do not perceive technology in the arts as serving mankind so directly. Feeling a loss of human function rather than a gain of concrete benefits, we view technology in a negative light because we have no control over its intrusion into our lives, and no control over its creation. Because of our increasing dependence on technology, those of us who think we have something to say ought to become more actively involved in its conception.

No technology is Utopian. However, we must not dwell on what we have lost—clearly all advances produce a residue of regret! It is more important to consider what we have gained. The beauty of the computer is not that it might allow us to design cars more efficiently, but, rather, that it might allow us to reconceptualize the very notion of the automobile. Today, at the onset of the almost universal use of digital technology, we have an opportunity to understand it and to mold it for our utility. Previously, it had taken intellectuals many years, even generations, to understand how technology could change cognition and interaction. It is the very speed of the new digital communication which facilitates our understanding of it. We ask why our educational institutions are failing by not helping us more readily grasp this inflection point. Technology must be the subject and content of creativity.

In the testing and development of any new technology, as it moves from prototype to market, a person called an early adapter plays an important role which may, in many cases, be counterproductive. This is the person who, for whatever compulsive reason or fetish, must have the latest technological gadget. Many of these people are curious, some are obsessive, and some are merely frivolous. But new technology needs the financial support of their early pur-

11 Fritjof Capra, *Turning Point, Science, Society and the Rising Culture* (New York: Simon and Schuster, 1982). He asks not how we can use science or technology, but how science and technology and, in particular, modern physics have altered the world. Along with others, he chronicles the demise of the Newtonian foundations of science. He calls for a paradigm shift in the way we view the world from a mechanized system of reductionism to a more universal view of interdependence based on pattern and relationship.

chases. These are the people who bought $500 calculators, the Model T Ford, or the Altair home computer. These purchases endow the early adapter with authority and uniqueness. Unfortunately, much of the feedback that developers use to create and refine new products comes from these early adapters. This feedback all to often reflects the vanity of the adapter and the fetishizing of the technology, rather than reasons of human utility. What would happen if the alpha and beta test sites were placed in the arts school or the poets' coffeehouse?

The propagation of much that is touted as important is in the field of contemporary design. The chic, another form of early adapter, seeks to protect their authority as the most *au courant*, whether they be critics, editors, curators, or highly financed connoisseurs playing to a system of self-aggrandizement and commodity-promoting acquisition. Like feedback from early adapters of technology, feedback from these arbiters of culture more often reflects their selfish needs rather than any constructive communications. The new drives itself for itself.

Even as technologists inadvertently have territorized themselves, losing track of certain human values that further the map of the mind, a line also encircles the society of arts and letters. While it is easy to chide the "techie" for a lack of poetry, it is not so acceptable to hold the world of the arts accountable for our great loss of the humanist concerns. Nevertheless, the contemporary scene has managed, in its insistence on theory, arcane jargon, deconstruction, and celebrity, to have detached us from the classical models of feeling, seeing, and thinking.[12] The new academic stars of the university are as suspect as any sequestered engineer. Ironically, in this case, there is no difference between the worlds of technology and art. A culture which produces and needs the methodologies described above for pushing the new inevitably is going to create items for conspicuous consumption, and creativity, as it alienates everyday communication needs for both art and technology.

Cross Fertilization

The sculpture of the artist Kenneth Snelson and its influence on the biologist Douglas Ingber shows how the fields of science and art can inform one another. In the late 40s and early 50s, Snelson and Buckminster Fuller, the remarkable engineer / architect, developed the principle of tensegrity.[13] In the 1990s, Douglas Ingber used these architectural principles to better understand cell behavior, and developed an anticancer drug now in clinical trials.

This story begins in 1948, when Snelson, then an engineering student, attended a summer session at Blackmountain College, the experimental school in North Carolina. There, he studied art with the Bauhaus master Joseph Albers, and architecture with Fuller. Snelson, after his exposure to a variety of media in the cross-disciplinary atmosphere of Blackmountain College, developed the con-

12 Jacques Barzun, *The Education We Deserve* (Middletown, CT: Wesleyan University Press, 1989), 181.

13 Tensegrity refers to a system that stabilizes itself mechanically because of the way in which tensional and compressive forces are distributed and balanced throughout the structure.

cept of tensegrity. After his exposure to Fuller, Snelson began building small sculptures out of wire: "I had learned much about geometry from Fuller, as well as art and design from the Bauhaus."[14] Eventually, Snelson would become well known for his large-scale sculptures, ethereal but complex constructs of struts and cables. They are not rigid, yet have great structural strength because of their ability to flex and move; load is continuously transmitted across all structural members. Twenty years later, Douglas Ingber, a medical student who studied sculpture, saw Snelson's work and made the connection between tensegrity structures and that of the biological cell. Had he followed the more conventional path of the molecular biologist, he never would have been in the sculpture class which allowed him to make this great leap.

The computer and the digital network are ideal tools for the creative interlocutor. Rather than erect boundaries between areas of thought, the computer, if approached properly, has the ability to remove them and allow the return of liberal arts to their traditional meaning, freeing us to think. Our colleagues now must overcome their hesitancies regarding both the machines themselves and the change wrought by the digital. Technology historically has aided, rather than hindered, human expression and creativity. From the introduction of the phonetic alphabet, to movable type, to photography, invention has served to uncover more for more.

Yet today, the human potential of the computer all too often is ignored. The self-fulfilling prophesy of entrenched interested (be it tenured faculty, established designers, or whomever) that technology is becoming more incomprehensible will only become more so if humanists don't engage it. Such excuses as "You can't touch it; you can't read it in bed; it hurts my eyes," and so forth, are fears that are deeply inhibiting. These fears segregate minds, all too often humanists' and designers', whose creative input is vitally needed in the implementation of this new technology. The irony is that the seemingly threatening power of the computer reinforces the power of the technocrat, who then directs, designs, and implements technology for technology's sake. Thus, development drives culture rather than culture driving development. Ask not what the computer can do for you, "but...."

The computer has value as it enhances our ability to learn, or rather to learn how to learn—the knack to order, manage, and reconfigure that which we know. Being cultured lies in our ability to transmit from one to another, allowing others to gain access to successful formulations and articulations which further our notion of being. This is what builds culture: the accumulated conceptual riches brought through the history of civilization. It is the failure of education today, and maybe most directly those who espouse the liberal or visual arts, to recognize it is not how much we know, but how we use and share that which we know.

14 Kenneth Snelson, letter to R. Motro. Cited at http://www.teleport.com/~pdx4d/docs/rmotro.html.

We foresee a new creative individual, an aspirant modeled on Leonardo da Vinci, the weavers of the Bayeux tapestry, Anna Sibylla Merian, Samuel F.B. Morse, the Roeblings, Booker T. Washington, Charles and Ray Eames, Benjamin Franklin, Tim Berners-Lee, and countless others whose reach across boundaries changed civilization for the better. This individual is one who is both integrated within the technology and an integrator of these post-revolutionary times. Their integration allows their creativity to function as an organic part of society, as he or she acts to connect for the common good. They are distinguished by their ability to negotiate the disparate fields of human knowledge, bringing them together in previously unimagined ways, and relating them for others to use meaningfully.

In his last book, the Italian writer Italo Calvino states that creative visualization is a process that, while not "originating in the heavens" goes beyond any specific knowledge or intention of the individual to form a kind of transcendence. Not only do poets and novelists deal with this problem, but scientists as well.

> To draw on the gulf of potential multiplicity is indispensable to any form of knowledge. The poet's mind, and at a few decisive moments the mind of the scientist, works according to a process of association of images that is the quickest way to link and to choose between the infinite forms of the possible and the impossible. The imagination is a kind of electronic machine which takes account of all possible combinations and chooses the ones that are appropriate to a particular purpose, or simply the most interesting, pleasing, or amusing.[15]

Despite, and perhaps because of, our familiarity with the new digital tools, it is all too easy to lose sight of their potential. All representation and communication, no matter how it is physically manifested, is a means for human expression. The digital computer, when combined with the optical scanner, the music sampler, and a myriad of other computer input devices, allow us to reduce all physical media to a virtual binary digit. When sound, or photographs, or film, or sculpture become digitized, the traditional boundaries separating them become eased. This easement of boundaries allows the creative interlocutor to work across academic and artistic boundaries which would have traditionally hampered him or her. Every digital movie, and every digital image, every digital sound is nothing more than a sequence of zeros and ones stored in the memory of the computer. These numbers can be seamlessly combined and juxtaposed by the creative interlocutor. In the computer's virtual spaces, all forms of communication are equal.

Educators might use models such as that of Vitorino de Feltre of Mantua cross disciplinary institutes to free them from the dogma of rigid academia which prevents them from reaching

15 Italo Calvino, *Six Memos for the Next Millennium* (Cambridge: Harvard University Press, 1988), 87–91.

through technology for greater understanding of a rational scheme of the world. Educational practice should teach us how to learn by employing the ubiquitous interdisciplinary tool of the computer. True creativity lies in the management of knowledge, not in the production of given objects of art, or tomes of discourse.

Precursors of multimedia and hypertext have existed for centuries. Throughout the history of our culture, we have brought together creative energy in institutions, from the cathedral to the library, which represent our highest aspirations.

> Society itself becomes a web of consciousness, a form of imagination to be realized as a social construction.... Men in their imagination will always seek to make society a work of art: that remains an ideal." [16]

The present strength of the computer is its ability to coalesce our energies in the quest for enlightenment; its speed, flexibility, and strength in retention of fact enhance what already has been embedded in the constant course of human intelligence—the desire to create new meanings through relationships.

We posit that the visionary designer, the creative interlocutor, is one who is both integrated and an integrator. This individual is learned in a manner so that his creativity functions as an organic part of society, and he or she acts to connect for the common good. The creative interlocutor is an integrator in his or her ability to negotiate the disparate fields of human knowledge, and bring them together in previously unimagined ways. In so doing, this person enables others to further their creative potential.

16 Daniel Bell, *Coming of the Post-industrial Society* (NY: Basic Books, 1973), 488–9.