

Imaginary Informations

Notes on Art, Technology, and Other Manipulations.

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'Truth' is just a second order phenomenon, a distortion of distortion, a necessary illusion . . . We discover that true knowledge is not rational order, but fascination."

Allen S. Weiss, The Aesthetics of Excess, p154

"It is precisely because information theory cannot and should not be applied to aesthetic phenomena that numerous scholars have tried to apply it to the field of aesthetics."

Umberto Eco, The Open Work, p68

"Soon it will be possible to beam, not broadcast, radio and television signals anywhere in the world. In other words, it will be possible for one people to take part in another's domestic political discussion. But what messages do we wish to send? And to what end?"

Angelo M. Codevilla, from Political Warfare and Psychological Operations, 1988

Let us consider *New Media* as a conduit for *Information Operations*. To assist in the consideration, this lecture will explore the resurfacing of an information-theoretic approach to art criticism that was born in the 1950's and temporarily put to rest in the early 1990's. I will argue that this resurfacing is necessarily tied to a radical restructuring of the concept of information itself, from both political and technological perspectives, and to the promulgation of interactive art. It is not my intention to promote an algorithmic approach to aesthetics such as was popularized in the late 1970's. I urge you to listen *experimentally*. The ideas are meant to be used by artists to conceive of work relevant *to*, not created *by*, the information domain. More to the point: I am not interested in the automation of interpretation, but rather the interpretation of automation. It is true that one sometimes leads to the other, but I prefer to leave the inner workings of cultural criticism to the realm of magic. Sometimes this means using numbers, sometimes it means hypnosis.

"Imaginary" is used here to mean a few things: projected, pictured, imaged, emergent, expanded, third-order, abstract, performed, simulated, virtual, unreal. And so this lecture is itself, to some extent, an imaginary one: it *projects a model* for understanding the concept of information. In fact, it proposes multiple

models -- artistic, technical, and political. The lecture is *real*: to be sure, I am standing here, but the concepts in it and the thoughts you will have listening to it are *not real*. How can a concept be real? In fact, they are fascinations or hallucinations.

"Informations" are, surprisingly, even more elusive since they contain a measure of expectation. They encompass all ranges of credibility, from the absurd to the conspiratorial to the dogmatic. Misinformation is a type of information, as is disinformation. These are different types, as we will see, and people disagree on *how* they are different. Let us just say that Informations represent a set of possible realities. As artists, we can use them in any combination, and consider each one to be a tool hanging from our belt: a handkerchief, a dagger, some tobacco, a bit of gunpowder. In the old American West fur trappers called such tools on their belts "possibles" because each one might be needed at any given moment. They would use their possibles to hunt, build traps, kill bears, and smoke. "Possibles" were reliable devices for survival that have since been replaced with cellphones, PDAs, purses and wallets: tools used for the exchange of goods and information. Digital media artists do not seek the skin of animals, we seek the skin of reality, and we use our communication devices to peel technology away from science.

"Imaginary Informations" can be conceived then as comprising both expected and unexpected realities and unrealities. Imaginary Informations can easily be created and manipulated with words, cameras, computers, haptic-interfaces, and the internet, and are ultimately the components of a flexible-theoretical communication system that *adapts* to environmental pressures by modifying them in an open-loop. The concept can be applied to multimedia technologies, artistic practice, and political posturing. In a general sense, they represent the composition of a reformed reality: from the pseudo-anonymity of online social networks to audience interactivity and conspiratorial delusion. This consistent reformation of reality is nothing new, and has always resulted in an artistic fascination with deceit, secrets, and lies. What is arguably always new is the technological *spin* on reality, which allows us to project information from one dimension into another dimension in persistently new and exciting ways. Reality becomes more augmented and unreality becomes more immersive, and the role of technology in this re-shaping is tending towards *invisibility*. Simultaneously, technology is becoming more *social*: it is being used to foster, create, manage, and mediate human relationships and collaborations.

Information Theory, Psychological Operations, and Aesthetics

Information theory is a mathematical system for measuring the reliability of communication, developed by Claude Shannon in 1948 to optimize electronic

signal coherence. It assesses the amount of 'information' being communicated as something proportional to the uncertainty of the signal that carries it. Unexpected events contain more information than expected events. If a bird were to crash into the window beside you, there would be a great deal of surprise, and hence quite a bit of information. Crucial to Shannon's theory is the *decoupling* of information from meaning or significance. This is something aestheticians later used to analyze how meaning can be derived *from* information.

Just one year before Shannon's publication, the United States established the Central Intelligence Agency and the National Security Agency, aimed at maintaining information gathering operations begun during World War II by "Wild" Bill Donovan's Office of Strategic Services [OSS]. In the 1950's, as the U.S. CIA "wonder boys" began meddling in Guatemala, Donovan's original concept of *psychological agency* came to fruition. In a paper titled "U.S Army Special Warfare: It's Origins" Alfred H. Paddock, Jr. writes

Donovan's concept of psychological warfare was all-encompassing. The first stage would be 'intelligence penetration,' with the results processed by R&A [Research and Analysis], available for strategic planning and propaganda. Donovan called propaganda the 'arrow of initial penetration' and believed that it would be the first phase in operations against an enemy. The next phase would be special operations, in the form of sabotage and subversion, followed by commando-like raids, guerilla actions, and behind-the-lines resistance movements. All of this represented the softening-up process, prior to invasion by friendly armed forces. Donovans' visionary dream was to unify these functions in support of conventional operations, thereby forging 'a new instrument of war.'

Paddock elaborates that Psychological Operations "may be defined broadly as the planned use of communications to influence human attitudes and behavior." As such, it is easy to leap from the mathematics of expectancy employed by Shannon, to the chess-like calculations employed by Donovan and his legacy. Indeed, *today* the brand new field of political strategic influence is called *Information Operations* and has even more mathematical underpinnings. Martin Libicki, of the Rand Corporation, states that Information Operations [IO] is still purely theoretical and as such open to interpretation.

It is very difficult to prepare strategically -- unlike chess, Nth order decisions are made on an ever-changing board. IO addresses the very ability to make decisions. (Conquest in Cyberspace, p92)

What is truly fascinating is that amongst the early technological and political "breakthroughs" in information management, a new criticism was taking shape. In his seminal 1958 work, Information Theory and Aesthetic Perception, Abraham Moles lay the groundwork for a information-based critical analysis of

expectancy and originality in art, by applying Shannon's principles to music and language. Thirty years later, Umberto Eco, in The Open Work, summed up this field by comparing basic tenets of information theory to the nuanced techniques used to interpret great works of art. By 1993, Yve Alain Bois had published an article called "Thermometers Should Last Forever" in which he talks about Ed Ruscha's text paintings and the *thermodynamics* of language in terms of noise and entropy. Both he and Eco, however, declared information-theory dead to aesthetic study, even as they used it to explore its limitations and concluding that it is, perhaps, essentially irresistible to employ the science of communication in artistic analysis, despite its ultimate failure.

What has been ignored, critically, is the fact that inside the U.S. intelligence community at the end of 1980's there was a simultaneous slump in favor for Psychological Operations. In other words, in the U.S. at least, both art criticism and political diplomacy shied away from the study of information-theoretic manipulations of influence at roughly the same time. As discomfort grew with American Iran-Contra scandals and Reagan's "Project Democracy" and "Project Truth" propaganda campaigns, perhaps the art world sensed the boredom with any information-centric cultural criticisms. The 90's was to be purely beauty and excess, less "influence" and more "fascination". Perhaps it is no coincidence that the artistic-political fall from grace coincided with the collapse of the Soviet Empire, for the failure to foresee its collapse was one of the great intelligence failures of the U.S. Central Intelligence Agency. The largeness of this unexpected information in 1991 turned the concept of an all-knowing information organization on its head.

Social Computing, Information Operations, and New Media

So why return to it now? In 2005, the Bois paper was republished in the magazine *October*. Why reprint an old article from 1993 that addressed an approach to criticism that had been beaten to death? Is it because of a surge in attention to Ed Ruscha or a surge in attention to the concepts he manipulates?

Well, how we define information is changing: artistically, politically, and technically. Technically it is changing as computers shift towards social computing and from binary to quantum logic -- quite literally from "bits" to "qubits". Politically it is changing as the "information-sphere" has itself become a battlefield between governmental policy, micro-journalism, and terrorist recruitment (Psychological Operations is now a subcategory of Information Operations). We can even lump everything together into the undeniable reality of a techno-political information free-for-fall. And now that the information has evolved in our minds, we can look at Art and decide for ourselves whether there even has ever been a connection between aesthetics of art and the thermodynamics of information or whether we were right to abandon the idea. In

other words, now is a good time to examine what theoretical connections, if any, exist between the information world and the art world. I think we can expect more scholars to start doing so.

More obvious, perhaps, is the relevance of the topic to digital media artists. Since I am one, I'd like to delve into this more. Information theory has blossomed inside the current technologies of multimedia signal processing, video and voice over the internet, and the emerging "global brain" jerry-rigged by online computational semiotics. Video artists, for example, have a particular stake in any assessment of cultural spill-over from the information domain, as information is our deliverable. If we find there is no relationship between the re-definitions of information from a techno-political standpoint and the evolution of artistic practice and the cultural operations that support it (i.e. the art-world-network), then everybody probably needs to do some serious soul-searching to find out what the connection actually is.

In an article titled "Social Machines" published in the MIT Technology Journal, Wade Roush outlines the basic notion that advances in technology have shifted focus towards a higher level management of human relationships. Technology is being used to create and manipulate social situations. This concept is explored voraciously across the internet as social applications are expected to become a huge market. On socialcomputingmagazine.com there is an article called "Architectures of Participation: The Next Big Thing" which sums it up: "Generally, what this means for software, both inside and outside of organizations, is that the power of harnessing the innovation and output of your users will eclipse almost anything that centrally organized production could hope to match." Wikipedia, for example, is a reality produced by mass participation and intricate levels of trust. Facebook, Orkut, etc. redefine human relationships.

Compare this to the fact that "Information Superiority" is the newest force in international diplomacy. The United States Department of Defense [DoD], for instance, in 2003 developed an "Information Operations Road Map" which outlines the need for a comprehensive policy bridging modern information technologies with ever-debatable methods of Psychological Operations [Psyops]. In this regard, there is a burgeoning ideological battlefield that is proving to be radically different from Cold War era US/Soviet exercises in propaganda. The DoD has called for a micromanaging of information collection and dissemination at all levels of government involvement: from public policy to electronic warfare. The core issue is a new one: at what point does information manipulation constitute an attack? How do we measure violence occurring at the level of the bit? And, more difficult to determine, how does allowing access to certain pieces of information ensure national security?

Libicki quotes from Ryan Henry's and C. Edward Peartree's writing in

"Military Theory and Information Warfare" (Parameters, 1998).

The more radical of the theorists predict that information warfare will not only provide dominant awareness of the battlespace; it will also allow us to manipulate, exploit, or disable enemy information systems electronically. The intent here evidently is to knock an enemy senseless - literally - and leave him at the mercy not only of conventional kinetic attack, but of psychological operations aimed at controlling his perceptions and decision-making abilities. Public opinion is to be shaped, leaders will be cut off from citizens, and the mind of the enemy will be directly penetrated and his strategy defeated. In the ideal case, all this will occur bloodlessly, fulfilling Sun Tzu's goal of victory without battle. At least that's the theory.(p38)

The current international political environment revolves around *deception* and promotes a synesthetic hybrid-definition of information which spills between awareness, perception, misinformation, and disinformation. Misinformation and Disinformation are distinguishable -- but analysts disagree on their definition. The U.S. State Department, for instance, defines the difference as a question of intent: if the sender intends to deceive, then the information is disinformation, whereas an innocent error may result in misinformation. Some experts at the Rand Corporation, like Martin Libicki, have a more receiver-based definition: in the case of misinformation, the receiver believes what is *not* true, whereas with disinformation, the receiver is *unable* to believe what *is* true. This latter definition proposes that it is not necessarily up to the sender to decide whether information is *mis-* or *dis-* and that it is a question of perception, rather than intent.

Quantum Computing, Information-Glut, and Asymmetry

"Just as there is no message entirely devoid of noise, no information can ever exist that does not have to rise above an ocean of noise."

-Yve Alain Bois, "Thermometers Should Last Forever"

As regards information operations, "Asymmetry" is used to describe everything from deadly cultural differences, to encryption techniques and "Friendly Conquest" (see especially Joseph Nye on his concept of "soft power"). An "Asymmetrical Cipher" is a one-way algorithm which allows for modern day internet security. "Cultural Asymmetry" is a term used to explain the source of terroristic behavior. "Asymmetrical Coalitions" are political diplomacies that ensure Information Superiority remains on one side.

I'd like to delve into this buzz-word "Asymmetry" more but for now let me just comment that the relationship between Art and Technology is Asymmetrical. Consider at least that in the United States the funding for science drastically

outweighs the funding available for art, while the products of science are drastically cheaper: one can buy a computer for half the price of a young video artist's mediocre DVD. So while funding is up for the sciences prices are up for the arts (see Dave Hickey on this topic of over-valued work).

Something specific to explore would be the power relationship between technology and art. It might be as simple a question as this: now that we've "achieved" a state of Information-Glut and some of the old information-aesthetics are, possibly, returning, who is "wearing the pants" so to speak? Consider, for instance, that the hallucinatory computer-graphics images we see more and more of in installations are emerging from a general aesthetics of excess, rather than just some disconnected technological advancement. Technology is evolving from social circumstance, which is where art reigns supreme. What exactly does the asymmetrical coalition between technology and art look like?

To escape this analysis, and as a final thought, let's consider a different type of asymmetry: Quantum Entanglement. There is little doubt that quantum computing will revolutionize information theory - with it will come the ability to factor large prime numbers used in security applications. Quantum Entanglement -- the means by which two 'qubits' of information can communicate -- can be considered an *asymmetrical truth*. To help us conceptualize this here are some thoughts from an IEEE Spectrum journal article entitled "Commercializing Quantum Keys". In it, Samuel K. Moore writes:

When we measure an electron's spin orientation, there will be only two possible outcomes: the spin and the external field are pointing in the same direction, or they are pointing in opposite directions. These two possibilities are also referred to as spin up and spin down, respectively.

...

Two entangled spins can exist in a superposition of, say, up-down and down-up. You don't know which electron has which spin until you measure it. But as soon as you measure one spin, that means the other spin must have the opposite value.

...

Each electron's spin by itself has no definite orientation until one of them is measured, no matter how far apart they are. Einstein rejected this notion and famously called it "spooky action at a distance."

'Spooky', or imaginary information is precisely what we are after. But by now the reader of these notes must have noticed that these thoughts are not complete. Consider all of the above to be potential ideas: merely projections. Allow the notions presented above to dissolve slowly back into your daily life.

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