

**Reverse Engineering**

**Plenary Address  
Patricia R. Zimmermann  
Ithaca College**

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**I. Iowa and Chile**

Thank you. I would especially like to thank Professor Ruedi Kuenzli and Professor Kembrew McLeod for their gracious invitation to return to the University of Iowa. I am deeply honored to speak to you at the beginning of this symposium, Collage as Cultural Practice. I also thank them for their labor in organizing what promises to be a significant and dynamic international event, and in bringing all of us together here.

I speak to you today not only as a film/video/new media historian and theorist, but also as an alumn of both the Cinema program and the English department. I also speak to you as a person who is deeply grateful for my time here at the University of Iowa as an undergraduate in the mid 1970s. I graduated from this institution an entirely different person than the person I was when I took my first English lit course and learned to avoid the passive tense and is verbs and always prove my arguments. From the Chicago suburbs, I arrived here with dreams of transforming into a morph between Emily Dickenson and Dylan Thomas, consumed by deep, ineffable, individualist and adolescent emotions that only poetry and glorious obscure language could exorcise.

Then came an endless barrage of incredible, demanding, brilliant professors who yanked me out of my own solipsism and into a larger conversation with world through challenge, debate, fearlessness, and courage: Dudley Andrew, Miriam Gilbert, Gayatri Spivak, Franklin Miller, Charles Wright. After the coup in Chile, Iowa faculty introduced me to Latin American cinema, Pablo Neruda and Gabriel Garcia Marquez, who I read at Hawkeye football games my father dragged me to during Parent's weekend. To these professors, I want you to know that I still carry your ideas with me. I thank you all.

My talk today is entitled reverse engineering. I will attempt, on a conceptual level, to pirate an engineering model designed to collectively take a machine apart and then to rebuild it better. We need to rethink the transnational and geopolitical stakes operative in the current machinery of empire, world domination, genocide, full spectrum dominance, infinite war and occupation. Please allow me one more reverse into history-- my first year here on campus in the fall of 1973.

On September 11, 1973, a coup against the democratically elected socialist government of Salvador Allende erupted. The next day in the dormitory cafeteria, a couple of very, very intense graduate students yanked us to a demonstration in front of the telephone building in town to protest this coup, allegedly propelled by the CIA. I went with a group of dorm friends, most of us white, most of us suburban, most of us clueless about world politics. The very small demonstration featured several graduate students exhorting very complicated Marxist analysis of the US government and political repression. I had a hard time following them. The intensity of their language and the strange crazed way they slung around words like hegemony, neocolonialism, ideological

state apparatus, repression, corporate power, socialism intimidated me. Although I didn't understand what they were talking about, I knew it was bad, I knew the US government was involved, I knew this wasn't Daley Democrats from Chicago, and I knew they knew things I didn't know.

Later that week, my new boyfriend, whom I had met three days before in a required Speech class, dragged me to an experimental electronic music concert on campus. Some long haired graduate student guys in blue workshirts and big boots played discordant cellos, dropped bricks on the floor, and plugged gadgets and wires into what I imagine were some kind of computers to make strange, disconcerting sounds. Like the demonstration about the coup in Chile, I also had a hard time understanding these graduate students. International politics, experimental music, literature, and technology were all separate languages with no interface I could easily map.

So today, 32 years after the Chilean coup, two years after the US invasion of Iraq, one year after the circulation on the internet of the atrocities at Abu Ghraib shot on digital cameras, and three decades after war, genocide, rape, illness, death and destruction around the globe propagated by the US imperial regime, poetry, politics and technologies can no longer be separated. This separation, I would argue, needs to be reversed engineered within the transnational matrix of racialized and gendered empire. We must reverse engineer the amnesia and anaesthesia of transnational capital and the Bush regime with polyvocality, polyphony, plural temporalities and geographies, and an incessant solidarity. This requires a historiography of contiguities, pluralities, polyphony that resembles a fugue. Examples of how this might look can be found in the work of digital artist Philip Mallory Jones, who creates digital paintings where each component

represents a different historical period of racialized history, always transnational in connecting the disparate locations of the African diaspora from Africa to the Caribbean to the US. His work constructs contiguities with pluralized geographic spaces to reverse engineer the separations that figure the history of diaspora as fragmentation.

## II. Iraq and Vietnam

In engineering, reverse engineering identifies the systems' components and their interrelationships. It then creates representations of the system at another level of abstraction. Reverse engineering dismantles technologies like cars or computer code to understand how its parts articulate. It cracks codes and invents new forms, always emphasizing building something new out of the old. A feature of reverse engineering is customizing tools for new uses—which can function as a radical form of collage of technologies and machines--into new interfaces and new spaces.

Digital artist and engineer Natalie Jeremijenko's on going, on line open source encyclopedia of labor conditions and manufacturing process for contemporary consumer products provides an example of reverse engineering. Through tracing the production origins back on the product, her web project, [How Stuff Is Made](#), combines different technologies, from historical analysis, economics, labor, science, photography, wiki to reveal the hidden transnational and labor processes of everyday products, moving them from the everyday to the global. For instance, the site shows how nearly all US flags are manufactured in sweatshops in China

One historical example of reverse engineering comes from the war in Vietnam. Vietnamese recycled the metal from downed US warplanes and made booby traps to fight

US ground troops. They refashioned the US warplane tires into rubber strapped sandals for tropical warfare that predate Merrills and Texas. The North Vietnamese recovered the footage of napalm bombing from crashed US B 52s and pirated it as evidence of war atrocities in their documentary films, smuggled out of Vietnam and then circulated in the international anti war movement.

In my own region of upstate New York--an area with a rich, variegated and highly contested history of experimental imaging that extends back to the 19<sup>th</sup> century and is one of the epicenters for electronic and digital media arts practice-- reverse engineering of tools resides at the core of video image processing, image and signal manipulation, and experimental video, film and digital media. For example, artists and toolmakers like Woody and Steina Vasulka, Bill Etra and David Jones built new machines and tools, using schematics to create an algorithmic mathematical art in collaborative processes that predates Photoshop and Combustion by 25 years. One early technologist manipulated the video image simply by inserting a screwdriver into the TV itself to short circuit its stability, combining two different tools of domesticity to make something new. Machinery was taken apart, recombined, layered and collaged together to create new spaces and new images.

I want to argue for the political urgency that reverse engineering be added to the tactics of pirating, pranks, collage, culture jamming and copyleft as strategies for resistance and intervention into transnational capital and empire for several reasons. In the context of the US Department of Defense Joint Vision Statement 2020 that calls for full spectrum dominance of the space, sea, land, air and information, it is non negotiable that advocates for radical democracy engage in full spectrum resistance. Since 1991 in

Bush Regime I, the department of defense, under the influence of Cheney, Wolfowitz, and Rumsfeld, have pushed for the Revolution in Military Affairs, a post cold war conversion from boots on the ground to a total and complete digitalization of warfare through control and deployment of all new technologies. They contend reality is “non linear, dynamic and assymetrical.” RMA, as it is called, forges enormous, complex linkages between the hardware and software industries and the government. The USA Patriot Act, passed in October of 2001 with little debate, broadly “expands surveillance” and constitutes “one of the most significant threats to civil liberties, privacy and democracy” according to the Electronic Frontier Foundation. It authorizes packet sniffing technologies like Carnivore and eliminates the need for a warrant.

In a completely different context, as pointed out in a recently published report on the state of independent media by Andrew Blau and the National Association of Media Arts and Culture entitled Deep Focus: A Report on the Future of Independent Media the public media field needs to jettison its old ways of thinking leftover from the 1970s that position independent media as completely oppositional to corporate media. In the new ecology of public media, the borders between different domains of media practice are blurred and fluid. The report explains that “the commercial/noncommercial distinction no longer serves the purpose it once might have,” because the “traditional relationship between the non commercial and commercial media systems is changing.” In this new media ecology cheap becomes the new normal, and platforms, forms, technologies, and interfaces multiply. The popular Bush in 30 seconds spots from Moveon.org exemplify this, as do the viral marketing techniques of anti war flash animation in email.

Computer games, as Deep Focus argues, are “being embraced as a platform for critique and education,” suggesting that public media needs to move into a more multiplatformed environment. Americans now spend more on video games than movie tickets. Gaming is a 7 billion industry. Now, the military is using commercial war games for advancing major strategic and scenario planning, for distributed innovation, and for training. The Department of Defense is now leveraging the enormous investments of IBM, Sony and Microsoft in gaming by deploying the advanced technological capacities of the XBOX and Sony Playstation. A major strategic capability of the DOD is simulation technology; however, the gaming industries capabilities have surpassed the military. As one article describing the military’s economic and efficiency interest in war games and gamers noted “video games made better soldiers and sailors faster, safer and cheaper.” And the military has developed its own gaming site for recruitment purposes: <http://www.americasarmy.com>)

After September 11, 2001, Osama Bin Laden was the most circulated skin on the internet. Gamers inserted his image into various war games, so that his image could be shot at and disseminated. Many sites featured games where one could use the mouse to kill Osama Bin Laden and other middle eastern figures, militarizing the mouse and racializing the home computer screen with the national phantasmatic.

A plethora of reverse engineering inspired anti- war games have emerged on sites like newsgaming.com, watercoolergames.com, seriousgames.org, and opensorcery.net. They combine interfaces and technologies, and not only images, to create interactive anti war collaborative environments. One of the most famous is Velvet Strike, an anti war

mod to the game Counter Strike, a multi player game where players join terrorists or counter terrorists.

Thus, as these examples perhaps suggest, the contours of this new media ecology for public media require reverse engineering our conceptual models of oppositional media as well as the technologies themselves. We must move from considering collage only in the realm of visuality and aurality into theorizing and actualizing collage as layering technologies, networks, and public spaces together.

In this reverse engineering framework, which I admittedly deploy quite provisionally as both model and metaphor, public media moves from images to interface, from fixity to fluidity and mutability, from object to modularity, from disembodied to embodied. Like the carnivore system of the US government, the absent images of the 20,000 war dead from Iraq, the outsourced mercenaries in Afghanistan, or the scanner at the grocery store, the machinery that secretly and without debate organizes empire has retreated into utter invisibility. Life proceeds as usual on a collective dose of Ambien, ignoring death, without interruption, in one monolithic, somnabulant voice.

This new post cold war, war without end, authoritarian regime requires thinking not only about images and discursive formations, but about technologies, technological formations and public space as endlessly mobile and circulating polyvocalities and pluralities. For example, the US Military has learned from Abu Ghraib: because nearly every soldier in Iraq has access to email and cellphones, broad and largely uncensored real time communications during war are unprecedented in history. Senior commanding officers at bases in Iraq have internet kill switches to enforce control over information flows in these networks.

In these larger contexts, reverse engineering requires putting the screwdriver into the machine where it doesn't belong, twisting it, interrupting the network and not just the image and the sounds, breaking the machine, and redistributing all the parts. We must be inside the machine itself.

### III. Malaysia and Geneva

The copyright industries, according to the International Intellectual Property Alliance, now constitute the largest US export. Some analysts claim copyright export now exceeds export of military products. However, as we have seen, Full Spectrum Dominance and RMA have demonstrated how the copyright industries and the military are intertwined and integrated with each other. According to Bruce Berkowitz in his pro-military book The New Face of War, 90% of military communications travel over commercial links, (138) He points out that decentralized digital communications have shifted war into network warfare where there is no front, reliant on zapping, swarming and maneuver warfare to create disorder.(76-90) A special palm pilot, for example, was commercially produced for special agents in Iraq and Afghanistan that would provide GPS mapping, instant translation, scenario planning, tactics and real time communication. If captured or hit, agents were instructed to crush the palm pilot with their boots and guns.

Perhaps a salient example signaling this merger is the Institute for Creative Technologies at USC, bankrolled by the Department of Defense and the gaming company Electronic Arts. It is dedicated to merging military applications and simulation technologies with the entertainment industry. It is no longer possible to consider

copyright or new technologies from an American or Eurocentric position. The TMCs, like the military, operate for full spectrum dominance of all distribution channels. As one writer in Sarai, the South Asian digital collective has argued, Interpol has now advanced the somewhat bizarre connection that intellectual property piracy finances global terrorism through DVD sales of Bollywood films, Disney children's movies, and Windows software. Interpol links the global circuitry of the pirated information commodity with asymmetrical netwar.

Many political economists have documented how post-Hollywood transnational media corporations have transformed into intellectual property clearinghouses, commanding monopoly power over copyright, licensing and trademarks. The Motion Picture Association, representing the seven major studios affiliated with the transnational media corporations (TMCs) uses the rating system of motion pictures as a front for its real activity, which is the worldwide policing of copyright protections for the industry.

Just last month, Downhill Battle, a political group supporting participatory cultural practices and a fairer music industry, organized 100 pirate screenings of the landmark documentary on the civil rights movement, Eyes on the Prize. Eyes, produced by Henry Hampton and a team of filmmakers, is a 14 part series produced in 1987 and 1990 for PBS. Originally, the rights for footage used in the film from a myriad of sources from television, amateur films, and other collection was secured for public television broadcast. Eyes on the Prize is the most widely disseminated and used documentary in American history, in many university, school and public libraries.

However, in the last ten years, rights clearance costs have escalated: it is more and more difficult to secure worldwide rights across different platforms. Some documentary

filmmakers engaged with the Eyes controversy estimated it would cost over half a million to secure rights clearance, a small amount of money for a TMC but a sum beyond the reach of Blackside, the original non profit producing company. As a result, the VHS copies in libraries are deteriorating. It is no longer possible to buy a copy of Eyes on the Prize. For black history month, Downhill Battle organized screenings of Eyes on the Prize in public venues across the country—another example of racialized reverse engineering in the area of film exhibition—to bring public attention to this crisis of the production of historical amnesia.

However, as salient and important as the copyright issue has become in contemporary activist and academic circles, it is equally important to triangulate intellectual property and the control over image and branding with the restructuring of these industries around technologies old and new. Since 1989, the TMCs have been equally interested in controlling the various platforms for media, emerging as not only global in scope of operations but transindustrial and transtechnological at every level. Products and images shift, change, remix, modularize, revise to move across many different platforms to maximize penetration of different markets and spaces across the globe. Remediation of visibility is no longer a theory of textuality but an aspect of global operations asset management to maximize profit.

The TMCs no longer focus on the manufacturing end of production, but on marketing, distribution and exhibition—control of all networks and spaces of media commodity circulation. The Matrix Revolution, for example, was recut for Singapore to delete the sex scene between Neo and Trinity, and Keanu Reeves, who is bi-racial, was remade into an Asian star Kung Fu expert conquering computers, code, and Hollywood.

The dispersed, decentralized, interactive, open source, collaborative, amateur and asymmetrical modalities of digital culture are anathema to the TMCs. They have responded by not only lobbying to extend copyright protections in the US through the Digital Millennium Copyright Act and all over the globe, but by becoming both vertically and horizontally integrated to control all the technologies and means of distribution.

In December 2004, the MPA initiated Operation Eradicate in Malaysia and 11 other Asian countries in an attempt to not only crackdown on copyright piracy of DVDs, CD-ROMs and CDs, but to raid and then dismantle copying machinery and factories. Malaysia is currently the world's largest exporter of pirate entertainment software, enacting an estimated loss to the TMCs of over \$188.4 million. It is also one of the largest Muslim countries in the world.

The MPA's action should be contextualized within Malaysia's aggressive bid to enter the global information economy. The Malaysian government launched the Multimedia Super Corridor in 1996 in an attempt to convert rubber and oil plantations south of Kuala Lumpur into the Southeast Asian silicon valley with the lure of a 10 year tax holiday, a high tech digital infrastructure, and new cyberlaws for intellectual property. To date, 1200 cybereconomy companies have opened offices or manufacturing plants there, including Dell Computers, Netscape, Intel, Lucent, Sun Microsystems and Microsoft, yet the digital divide remains with 90% of elementary schools lacking internet connections and at least 25% of East Malaysia lacking electricity.

Piracy is a rampant, social, and above ground activity throughout Malaysia. In Johor Bahru, a short cab ride across the straits from copyright compliant Singapore, three story indoor shopping malls feature small businesses specializing in pirated software,

Bollywood films, Bollywood music and Beyonce, American and Hong Kong action pictures, and computer games. Customers routinely purchase DVDs and VCDs in the hundreds, with special motorcycle door to door delivery back to Singapore, where global media and information businesses run on pirated software from Malaysia. The piracy functions as the fulcrum point in a contradiction between the need of the Malaysian government to insure the west it obeys copyright and to use piracy as a way to create political stability in a multiethnic Muslim area through full employment. Piracy also operates as a way to resist the globalization of the transnational media corporations by earning money from Disney products rather than paying money to Disney. Thus, Malaysia's piracy constitutes a benign, consumerist anti-americanism.

Within this global, concentrated media environment, reverse engineering means expanding access to tools and information to collage a more diverse media ecology rather than a monoculture. A small triumph occurred in the US related to media infrastructure in June 2004 when the courts ruled against massive deregulation of broadcasting in *Prometheus Radio Project vs. the FCC*. Prometheus Radio promotes microradio, low power FM stations that broadcast to a small 3-7 mile geographic area, and initiates community builds through radio barnraisings. In a larger international movement, the World Summit on Information Society in Geneva in 2003 of progressive international NGOs created a Declaration of Principles. It advocates the interdependence and interrelationships between human rights, sustainable development, and universal, ubiquitous, equitable, and affordable access to information and communication technology. It demands respecting cultural and linguistic diversity and protecting the public domain by strengthening archives, libraries, museums and collections, recognizing

the needs of the least developed nations. It shifts the language of the digital divide to concepts of digital opportunity.

#### IV. India and Cambodia

Reverse engineering uses tools to disassemble a program or a machine. It can also employ 3 D CAD programs to make images of parts to translate the gap between the physical and digital world. Reverse engineering can then be theorized as an interstitial practice, in constant movement, never resolved, always disassembling to map the interrelationships between parts only to reassemble in new ways. In the global information economy, it is important to remind ourselves that these abstractions we pirate are globally embodied in real labor relations. CAD CAM reverse engineering, software development, and code have been outsourced to India, where over 1 million people are employed in a \$12.8 billion dollar export industry (sfgate.com “Indian’s Software Outsourcing to Draw \$17 B) that takes advantage of low wages in a country with English speakers.

In considering collage as intervention, we must also consider its role as a machine of reverse engineering of historical explanation and archives. Again, we must be careful to not reduce collage only to the realm of visuality and aurality, but also examine the necessity to reverse engineer tools, machines, technologies of power, and space. It means moving off the single screen to many screens, interfaces and provisional exhibition zones. It means combining machines with each other to produce collage based on reconfiguring and restructuring the interface and space

For example, Chris Csikszentmihalyi at MIT developed a mobile imaging system he dubbed the Afghan Explorer, an autonomous robot for remote cruising and imaging of rural and urban geopolitical hotspots to get news for the public in the face of Pentagon press controls of war zones. The machine was imaginary, looking like a child's remote control toy of a MARS landing vehicle. The toy was reverse engineered, rebuilt as a faux remote imaging device for Americans to secure blacked out news and images. It functioned as a translation machine between the physical and digital worlds of the the idea of invisible war.

Subaltern historiography from South Asia reorients and reframes these concepts of disassembling multiple parts of this new media ecology by locating this process within historical context, explanation, and significance. This historiographic model has reverse engineered Indian nationalism by expanding the archive to include the voices and practices of the subaltern and struggle. Dipesh Chakrabarty has argued that that historical is (42) "contradictory, plural and heterogeneous" even as schemes attempt to "naturalize and domesticate this heterogeneity." He looks for a historical model that would provide translation across cultural and other systems "so that the world may once again be imagined as radically heterogeneous." (46)

Critical historiography has figured temporal disjuncture and plurality as central to a reconceptualization of history, the archive, the releasing of suppressed contradiction. In place of the inertia of continuity and progression, a concept of contiguity is advanced. Contiguity is spatial rather than temporal. It reconfigures historical practice through juxtapositions, contradictions, and layerings to create new futures, not only new

meanings. The archive, conceived of all that is past, recovered and lost, is then always open and recombinant, evolving and not fixed, a process and not a product.

This new collaged archive combats the anaesthesia and amnesia of authoritarian transnational capital with synaesthesia and polyphony. In a historiography spliced with reverse engineering as a methodology, collective and political public memory is generated through networked models of hybrid and multiple temporalities and solidarities. Histories and stories, images and machines, are always retold and retold differently. As Ranajit Guha argues, they move from the speaker to the listener, from the state to the everyday, from the interface to the embodied, from the virtuoso to the amateur. He wrote “the world would open up with all of its pasts.”

Reverse engineering requires a collaborative, networked model that pays as much attention to collaging machines, differences, tools, exhibition spaces and solidarities as it does to deconstructing images. Our work must get off the wall and the flat screens. It must construct—whether it is theory or practice-- new imaginary zones through a multiplicity of screens and a hybridity of differences that creates new historical arguments, solidarities, and agencies. Ethnographer David MacDougall has argued for a collaborative, dialogic and polyphonic process of cultural production. By collaging different voices and practices, a participatory compound work is created. This compound work, which MacDougall defines as a “crossing of cultural perspectives,” creates a liminal zone that opens to contingency, embodiment, and performativity. It generates new common knowledge derived from interconnections rather than separations.

Let me quickly provide three concrete examples that illustrate this collaborative reverse engineering of tools, spaces, differences and histories. These examples all

engage the idea that collage is mutable, live, embodied, ephemeral, spatialized and performative. The Florida Moving Image Archive in Miami operates the Magical Movie Bus Tours. The archive rents a bus, works with a local South Florida historian, and then brings amateur film, newsreels and industrials on DVD to screen as the bus travels through different neighborhoods in Miami. The home movies of the Cuban neighborhoods post-revolution provide a different temporal zone to the contemporary neighborhood of third generation inhabitants. The archival film is cut and mixed as the bus travels through different neighborhoods. Participants on the bus can share the microphone and tell their own stories about the neighborhoods, triggered by the footage.

DJ/VJ Art Jones, a founding member of the Not Channel Zero Video Collective in the early 1990s, is doing live remixes of image and sound in a performance entitled Dismantling Empire: Live! The piece is a live audio/visual performance and DJ/VJ battle incorporating multiple video streams and music performed in real-time with multiple computers. The performance appropriates and remixes audio and visual elements from mainstream news, commercial, entertainment, and alternative media to critique how images validate and promote the idea of a benign 'new american empire.' 'Hi-tech' combat, embedded war journalism, prisoner torture, and post 9-11 security and surveillance form the source material for the live remix. Jones, then, dismantles empire by reverse engineering the separation of discourses, practices and technologies into an embodied knowledge and the gestation of a new public space. Through computers, music, multiple screens, the performance speaks to the networked nature of war and technology by reconfiguring new articulated networks.

S 21: The Khmer Rouge Killing Machine, a 2002 documentary by Cambodian filmmaker Rithy Pran, reverse engineers the trauma of the genocide of 1.7 million Cambodians by the Khmer Rouge. His project goes to the heart of a polyvocal historiography and a collage of temporalities. Through testimonies and reenactments of the experience in Tuol Seng with survivors and guards, he shows how the authoritarian Khmer Rouge reduced murder and genocide to the ordinary, exposing the horror of detail and dispassion. The survivors and victims confront each other through historical embodiment. Another project of reconstruction through reverse engineering and collage is the Yale Cambodian Genocide Project on the web, which functions as a portal of 22,000 biographic records, 6,000 artifacts and documents, and 5,000 images of victims killed in Tuol Seng, material dispersed, lost or hidden in Cambodian.

#### V. Everywhere

A politics of collaborative reverse engineering for new forms of collage, requires, by necessity and urgency, the generation of imaginary spaces. These imaginary spaces must mobilize reciprocal relations and participation, an endlessly open text and context--reverse engineered imaginative geographies. We must create new tools to translate between the physical and the virtual.

Collaborative reverse engineering insists that collage be enacted as an act of refusal. It opposes one temporality rather than a multiplicity of times. It opposes one story rather than polyvocalities. It envisions that the political project right now entails inventing—through reverse engineering-- new tools for historical transformation and transnational solidarities that are resolutely against empire and war.

None other than Soviet filmmaker and theorist Sergei Eisenstein reminds us why we are doing this work. He wrote: “Because we are not making films for me or for you or for anyone person, but for us all.” By collaging and customizing tools and spaces as well as images and sounds, reverse engineering demands that all of us, together, across our differences, undertake incessant reverse engineering, the endless rewiring and infinite reconfiguring required for a fearless, courageous, and exuberant anti-war politics.