The Poetics and Politics of Computer Code in Latin America: Codework, Code Art, and Live Coding

Eduardo Ledesma

Revista de Estudios Hispánicos, Tomo XLIX, Número 1, Marzo 2015, pp. 91-120 (Article)

Published by Washington University in St. Louis
DOI: *https://doi.org/10.1353/rvs.2015.0016*

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Código es el mecanismo invisible y virtual que subyace al software*, las instrucciones que lo ejecutan. En ciertos casos el código aflora a la superficie y se vuelve el objeto de la representación, como ocurre con la poesía en código (*codework*), un subgénero ubicado en la intersección entre la tecnología digital y la poesía experimental. Cabe preguntar, ¿qué aporta el uso de código a la escritura poética? ¿Nos hallamos ante un signo de la desintegración de la cultura en la era posmoderna, o ante la irrupción de una nueva vanguardia política y estética? En este ensayo examino la reciente aparición del fenómeno en América Latina, para elucidar las conexiones entre la innovación formal y la ideología en poesía de código. Arguyo que los artistas Latinoamericanos están utilizando esta nueva forma poética como crítica contra el capitalismo post-industrial, incluyendo su vertiente virtual, el e-capitalismo. La poesía y el arte de código interrumpen la creciente hegemonía de las megacorporaciones mediante una ética que enfatiza lo colectivo y las prácticas relacionadas con el hacktivismo. Específicamente analizo el trabajo de tres artistas representativos de la emergente estética del código en la cibercultura Latinoamericana: Giselle Beiguelman (Brasil), Antonio Mendoza (Cuba) y Mitzi Olvera (México).*

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Code Poetry/Codework(s): A Poetic Computing for Our Time

Code is the invisible and virtual mechanism underlying software, the instructions that make it run. Sometimes code surfaces and becomes the focus of representation, as is the case with codework poetry, a genre located at the intersection of digital technology and experimental poetry. This essay studies codework from the perspective of humanistic approaches to science and technology, and territorializes it within the specificity of Latin America. Codework, a variant

of digital poetry—itself a subgenre of electronic literature—, is a hyper-contemporary phenomenon whose radical emphasis on the present is attracting attention from the emerging field of critical software studies, also known as critical code studies, the study of the cultural implications of code. Rita Raley, a leading scholar in critical code studies, succinctly defines codework (code poetry) as an idiolect, a "text-event that emphasizes its own programming, mechanism, and materiality" and brings "the function and code of the computer to a kind of visibility" so that "code appears in the text, then, in whole or in part, in the form of a functioning script, an operator, and/or a static symbol" ("Interferences").[1]

Also known as code poetry and net.writing, codework refers to experimental writing that combines human or natural language with computer languages such as BASIC, FORTRAN, C++, and Unix to create poetry. An expanded taxonomy of codework, however, may also encompass code-inspired visual art and live coding, an improvisational performance that fuses music, visuals, and code in a display of technical and artistic virtuosity. In short, codework is art that integrates computer code in its overall aesthetic, blurring some of the "ontological distinction[s] between programming language and literary language" (Raley, "Interferences").

For code poets, playing with code does not represent a negation of aesthetic processes through the technification of art; rather, it provides an entry-point for a poetic exploration of the cultural significance of our digital world and proves code's centrality as a contemporary cultural artifact. As code theorist Mark Marino states, "code itself is a cultural text worthy of analysis and rich with possibilities for interpretation," affording a possibility to "critique the larger human and computer systems, from the level of the computer to the level of the society in which these code objects circulate and exert influence." Indeed, Marino goes even further in situating code within cultural practices worthy of study, by claiming that we must understand it in order to demystify its ideological operations, since "computer code is ideology, yet an ideology that is doubly hidden by our illiteracy and by the very screens on which its output delights and distracts." Through its meta-commentary on code, codework art both partakes of ideological formations and renders them visible, effecting a critique through the very process of bringing code to the surface of a work.

Before tackling the specific case of Latin American code art, I would like to examine a well-known Anglophone example in order to set the stage for later comparisons. The poem "Class Library" (2008), by British net artist Graham Harwood, illustrates how codework adopts the form and function of computer programming to engage with political content. Written in the high-level language Perl, "Class Library" is an executable program-poem whose purpose is to critique consumerism and class inequality.[2] Truly performative, "Class Library" simultaneously does something (it runs and produces output) and it states something (through both its output and its code). This fragment shows how class discourse is embedded in the code, through variable names and via comments (Figure 1):

```
package DON'T::CARE;
use strict; use warnings;
sub aspire {
    my $class            = POOR;
    my $requested_type   = GET_RICHER;
    my $aspiration       = "$requested_type.pm";
    my $class            = "POOR::$requested_type";
    require $aspiration;
    return $class->new(@_);
 }
 1;

# bought off with $40 dvd players
```

Figure 1. "Class Library" (2008). (Fuller 37)

The title refers to the computing term "class library," denoting an archive of ready-made subroutines of tested code which programmers can call up or reference from within a program, but it also alludes to a set of preconceived ready-made beliefs and expectations about social class. Located at the nexus of informatics and social criticism, Harwood's

program engages self-critically with its duality as abstract executable code and concrete poem about class divisions.

Like their Anglo-American counterparts, many Latin American artists have appropriated a code-inspired aesthetic, creating works that do not necessarily run as code, but which court the sense and appearance of computer algorithms. The poem "you CODE me" is a paradigmatic example, taken from an anthology of code art by Mexican artist Laura Balboa (Figure 2):

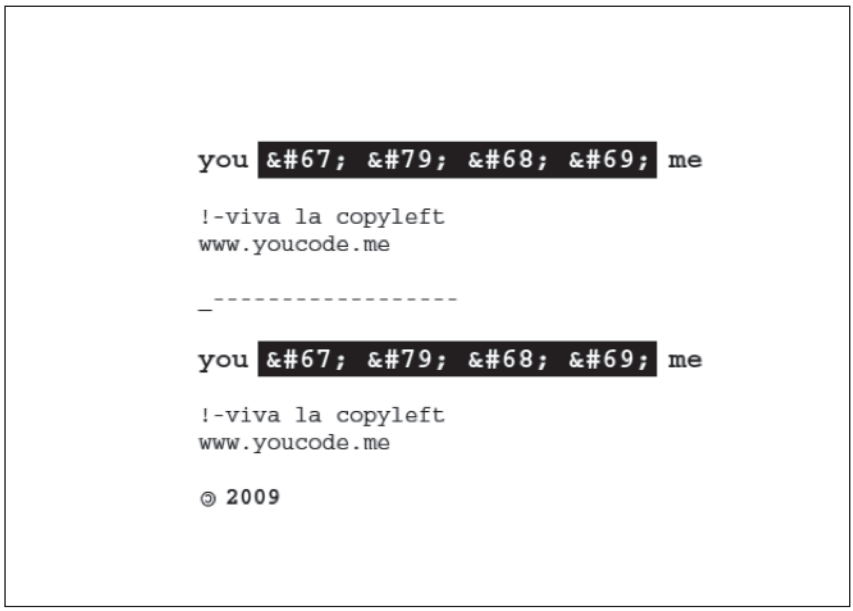

Figure 2. "you CODE me" (2009)

Balboa's poem may not be executable code, but it embodies the hacker's transgressive stance toward freedom of knowledge and dissemination of information through the deployment of codes and symbols. For instance, the poem represents a celebration of the concept of CopyLeft, symbolized by a "©" in reverse. CopyLeft is a play on words that seeks to subvert the copyright defense of intellectual property rights, espousing instead that creative works should be freely available for dissemination and modification, providing that any derivative works also remain resistant to proprietary claims. In this sense, CopyLeft is closely

linked to Creative Commons licensing. The reversed "c" mirrors other linguistic code violations, such as the heterogeneous fusion of Spanish, English, and HTML. Balboa's inclusion of Spanish ("viva la copyleft") disrupts and temporarily reverses code's Anglo-American cultural dominance, implicitly critiquing how English has colonized the language of programming and technology, while, paradoxically, also celebrating linguistic hybridity. Furthermore, by using the numerical references in HTML rather than regular script to signify the word "CODE" (the letter C is written as C the letter O is &#79), Balboa challenges Western assumptions about the centrality of Roman script while hinting at other possible forms of writing (pictographic, Hebrew, Cyrillic, kanji). By encoding the letters as HTML symbols that only signify to computing machines, Balboa derails and denaturalizes human reading practices. However, since "you CODE me" is not really executable code, it must be read or decoded by a human, translating the HTML symbols via an operation that mirrors (in reverse) the way computers translate source code into machine language: thus you (the human) CODE (process) me (the poem, the machine). The piece situates its reader at the intersection of Global North and South (linguistically and territorially), and between human and machine (semantically and cognitively).[3]

Autonomy, Politics, and Undecidability in Latin American Codework

Codework's relative obscurity and undefined status within the formal and political poles of avant-garde art begs important questions as to its potential social and aesthetic relevance. One might ask whether exploring the aesthetic possibilities of a form as seemingly sterile as computer code represents a sign of cultural decay and artistic exhaustion. I hope to show that it, instead, reflects the instantiation of a *new* political modernism, representing the cutting edge of a critique against post-industrial, capitalist society.

Codework first appeared in the United States, Europe and Australia circa 2000, with the work of artists such as Alan Sondheim, Ted Warnell, Antiorp, Jodi, noemata, and Mez. While codework from the Global North has focused on aesthetic matters (Harwood's poem is a rare exception), in Latin America it has established a tension between artistic autonomy and political praxis. On the one hand, the

Latin American works draw on an element of autonomy from the functional needs of the structure of code itself, while on the other, they attempt to historicize and politicize it by anchoring code in practices of resistance. Perhaps software's built-in technical autonomy—its demand for adherence to the rules of programming—is what creates the conditions of possibility for the political, granting a space where freedom and restraint are creatively linked. Paradoxically, works of code poetry seek and facilitate forms of liberation even as they constrain formal freedom, remaining beholden to the functional logic of executable code. Of course, formal constraint is always already part of art, so in that sense, code poetry has as much in common with the sonnet as it does with mathematics. Negotiations between freedom and constraint reflect how code art "provides a means for bringing the generative, reflexive, and anarchist intelligence of art into compositional entanglement with the ostensibly ordered and self-sufficiently technical language, working patterns, and material of software" (Fuller 8).

Additionally, Latin American net artists are conscious of the still unequal access to the Internet. According to Martin Lister et al., "unequal patterns of access are likely to be the dominant shaping factor of the global character of ICT [information and communications technology] use . . . the Internet is likely to exacerbate existing social inequalities" (182). Thus despite its apparently deterritorialized, virtual nature, Latin American codework is hardwired into local material and physical realities. As it endeavors to explore the presence of undecidability within code itself, Latin American codework reveals its own uncertain position, performing an ideological critique that bears the traces of its historical context and its geographical links to the Global South. Latin American code art oscillates between the material reality of its production and the process of virtual abstraction that it undergoes as it enters cyberspace and becomes distanced from its geographical and socioeconomic markers. Of course, those artists who have access to the world of programming are already working from a privileged position, even as Latin Americans. This, however, does not negate their capacity for critique, although it problematizes it.

Questions of how codework performs the political and the poetical are couched in the two defining poles of avant-garde practice: the formal and the ideological. Indeed, one might argue that codework's striving for radical change in form could either be associated with,

or wholly divorced from ideological critique. Raley, for instance, has argued that codework's political potential stems from the fact that "encounters with code, however fleeting, partial, or incomplete, . . . necessarily result not only in revised cultural forms and practices, but also in anxieties about intrusion, contamination, and uncontrollability" ("Interferences"). Those who do not know how to program may fear code as an unknowable, a black box buried deeply under software's graphical surface. Code engenders anxiety about surveillance and control, a paranoia substantiated by revelations about spy agencies' violation of digital privacy (Snowden, NSA). Responding to these dystopian aspects of code, the Latin American artists I examine in this essay target their art to disrupt, introduce glitches and viruses into the code's well-ordered fabric, to question its rules, and crash, or at least expose, its algorithms.

David Berry has argued that research into computer code (in its functional, artistic and discursive uses) is closely linked to other major questions concerning how technoscience impacts culture. Issues about allowing users to view and modify source code, for instance, are not only crucial to the "free software and open source movements," but also "crystallize discursively a more substantive challenge for wider society, namely issues surrounding the legitimacy of technocratic society, reflexive modernization, the democratization of technology, and the public deliberation of technology policy" (66). Recent trends in Latin America reveal an even more direct politicization of codework, through works that often aim to preserve a referential connection, indeed an interaction, between art and the real world.

Contemporary code poets are presenting code not as a mathematical certainty that through its programmability determines every outcome, but as an undecideable in the Derridean, deconstructive sense of an opposition to totalizing and complete meaning or knowledge, that which resists the very unthinking application of codified rules or programs and restores doubt to the process of decision-making; undecidability therefore becomes the origin of the ethical and the political. When viewed in this light, codework's deconstructive and self-reflexive nature itself represents a condition of possibility for a move toward the political. In the disruption and viral irruption that these artists and programmers seek, a moment of Derridean madness is injected into the system, dislodging its (seemingly) unyielding logic from the strict confines of the 0 and 1 binary, and shifting it toward the unexpected and incalculable, toward the glitch. Such uncertainty places the receiver, the

reader-viewer, back at the center of the process of signification, as the human negotiates the meaning communicated by the (often ambiguous) code. As such, works that foreground the errors or noise that creep into computing systems—disrupting pure communication—underscore the notion that "the noise of communication is not outside the system, but inherent in the undecidability of meaning" (Ward 99). The practice of codework poetry and code art becomes a critical intervention into the supposedly "neutral" character of code itself, a self-reflexive (artistic) inquiry into code's drive for efficiency and modularity, which exposes some of the problematic aspects hidden beneath its operations.

A great deal of the Latin American digital art production of recent years, including projects associated with code art, originates in the urban centers of Mexico, Argentina and Brazil, with other countries in the region lagging behind. Moreover, many Latin American artists display trajectories of displacement, whether through immigration, exile or temporary relocation, and many no longer reside in their country of origin, although they may maintain ties with their birthplace. Some, indeed, have relocated to Europe and the United States, further complicating their relation with the Global North and South. Not surprisingly, there is a wide spectrum of work being produced, from artists who emphasize their rootedness in national origins, to others who claim a globalized perspective, eschewing national and cultural markers. Moreover, Claire Taylor and Thea Pitman observe in *Latin American Cyberculture and Cyberliterature* that location and "locatedness" become shifting terms when dealing with online cultural phenomena, since "the Internet problematises notions of geographical fixity and specificity. Yet. . . . concepts of locatedness adhere in cyberspace" (10). Productive and problematic relations to the national and the global leave telling imprints in Latin American codework.

In the remaining sections of the essay, I will examine the political praxis of codework vis-à-vis three digital artists that deploy significantly different code aesthetics: Giselle Beiguelman (Brazil), Antonio Mendoza (Cuba), and Mitzi Olvera (Mexico). While focusing on these three artists to provide a sense of the many possibilities of code-inspired art, I will also tease out how they root their work in political and ethical concerns.

Case 1: Giselle Beiguelman (Brazil) – "//**Code_UP" (2004)

Brazilian artist Giselle Beiguelman's "//**Code_UP" is both an installation and a web-based artwork that explores how digital images are constructed through computer code, probing their abstract nature as binary code patterned with 0s and 1s rather than as indexical representations. Media theorist Matthew Kirschenbaum defines codework as the machinic process of encoding and decoding that turns binary code (or "scripted expression") into actual digital objects (images, text, sound files). Although Kirschenbaum is obviously referencing a different meaning of the term codework, one which implies performing computational operations, and not speaking about the literary modality of codework poetry, his understanding of binary code as an inscription which leaves traces on physical storage media is analogous to Beiguelman's own conceptualization of code as the substratum beneath the surface effects displayed on-screen:

> Binary code, in my view—the symbolized sequence of 0s and 1s—is thus the scripted expression of some particular formal regimen, and the forensic traces of that scripted expression on physical storage media are its inscribed remainder. Digital preservation turns out to be all about "codework," the reading and revealing of codes so that data can be reconstituted in keeping with its original intent. (Kirschenbaum 233–34)

Indeed, despite the process of abstraction and dematerialization inherent in the digital and its underlying binary structure, Beiguelman's project restores in its viewer a sense of texture and materiality that transcends the virtual. Beiguelman's work establishes connections between the materiality of hardware and the virtuality of software, confirming that digital artifacts are "embedded in the particular histories of the hardware that supports them" (Evens).

Beiguelman's project, "//**Code_UP," began as an art installation that toured several countries (Brazil, France, Germany, Italy, Spain and Argentina) before being migrated to the Web. Its title, a reference to the film that inspired the project, mimics computer code by including symbols such as forward slashes and asterisks. In "//**Code_UP," Beiguelman samples images and film clips from Michelangelo Antonioni's 1966 film *Blow-Up*, itself loosely based on Julio Cortázar's short story "Las babas del Diablo."[4] Both the original short story and the film are deeply invested in probing the material and ontological nature of

media and of technologies of inscription; while Cortázar investigates the relation between writing and photography, Antonioni's focus is on the photographic and filmic image. Beiguelman extends the investigation into net art, examining the significance of code as the base for digital images and as software's basic building block, understanding code as a virtual material composed of text files inscribed on a storage device (floppy disk, hard disk, cloud). Hence all three works—Cortázar's, Antonioni's and Beiguelman's—delve into questions of materiality, whether challenging the supposed continuous fabric of analog media, or analyzing the discrete, indivisible units of digital pixel data as captured by alpha numeric symbols, and closely aligned with the material and symbolic properties of code itself. All three works also investigate how the material substrate of media such as writing, photography, film or software (code) embody specific practices which are subject to aesthetic and ideological operations.

In the opening screen of "//**Code_UP," Beiguelman asks a critical question that seeks to foreground the direct relationship between digital images and their underlying code:

> Digital images don't concern nature, but programming languages.
>
> Their colors—the basic standard of image perception—are produced by numeric systems, logic operations and electronic displays. Because of this they embody behaviors, attributes and recombinant dynamics.
>
> *How [do] those settings modify our ways of seeing and perceiving?* ("Opening Screen," my emphasis)

As if to answer that question, "//**Code_UP" constantly reminds its viewer of the many layers that connect the digital image to the numerical base that produces it. By changing the settings, by modifying the numerical signifiers that determine color, tone, hue, and so on, the nature of the images change. The same instability applies to script. We perceive digital signifiers, as Katherine Hayles has argued,

> not as a durably inscribed flat mark but as a screenic image produced by layers of code precisely correlated through correspondence rules, from the electronic polarities that correlate with the bit stream to the bits that correlate with binary numbers, to the numbers that correlate with higher-level statements, such as commands, and so on. ("Print" 74)

By displaying screens of code, by enlarging the individual pixels that make up an image, by animating a sequence of numbers that rapidly flash by to a pulsating techno beat, Beiguelman makes the viewer hyper aware of the code, bits and bytes that constitute the digital palimpsest.

How does "//**Code_UP" relate to Antonioni's *Blow-Up*? In the film, Thomas, a photographer, closely inspects some photographs he has taken of two lovers quarreling in a park. Wishing to arrive at an interpretation of reality through the images, he wants to find out if the photographs' background reveals a crime that may have been accidentally captured by his camera. Developing, enlarging and cropping his photos to arrange them as a narrative, Thomas discovers that with each subsequent enlargement the images lose definition, revealing the grain of their base materiality, but denying a clear "resolution" of the events: the blurry images may, or may not, reveal a gun, or a corpse.

In "//**Code_UP" Beiguelman takes the same images Thomas enlarges in the film, "blowing them up using programs that perform algorithmic zooms, allowing manipulation of the RGB values, exploration of the pixel and screen structure and their translation into different numeric systems and codes (hexadecimal, binary, ascii)" ("Index"). Where Thomas tries to arrive at the reality behind the images, Beiguelman shows that they are the product of numerical operations. In *Blow-Up*, with each generation of image enlargement there is a proportional degeneration of the prints, so that the material limits of the photographic media become visually exposed by the blurry forms that Thomas attempts but fails to decode. Both Antonioni and Beiguelman critique the belief that photography and film are capable of depicting unmediated reality. Instead, these media are exposed as being unable to penetrate the fabric or grain of reality, leaving viewers with the task of recreating or constructing a narrative from traces, memories and fragments.

Let us bring Beiguelman's piece into sharper focus. The website's main menu offers several options to click on. The titles "Blow_Code_UP," "Code_me_UP," "Code_movies," "Down Code," "We Coded it UP," and "?//**Code_UP" each allow the user to perform various operations on the images from the film *Blow-Up*.[5] For example, a function named "Zoom_RGB_UP" manipulates the RGB value of the images. RGB is a color system display for electronic devices that assigns a numeric value to represent the quantities of each of the red, green

and blue colors present in a color combination, so that any color can be defined with three numbers. For example, black is 0, 0, 0, denoting the absence of red, blue and green. A pure red would be 255, 0, 0; a pure blue, 0, 0, 255, and so on. "//**Code_UP" uses a still frame from Antonioni's film (Figure 3) and converts the RGB values for each pixel of the image into a three dimensional numerical coordinate, which is then plotted and displayed in a three-dimensional version of the still (Figure 4). Thus the image encodes or represents with the height of vertical lines the RGB values corresponding to the color of each pixel in the original film frame. The image also dynamically rotates along one of its axes. As Terry Harpold observes, with these various operations Beiguelman reveals "structures of depth in surfaces of the [film] stills that cannot be detected on the cinematic screen. Presented with these objects, the viewer is as Antonioni's protagonist, fascinated by an artifact of the film's technical manipulation that seems to disclose hidden values" (108). Beiguelman does not, however, claim that such digital operations bring us closer to any kind of truth, underscoring the impossibility of film, photography, or code to transcend its own material limitations.

Figure 3. "//Code_UP" (2004)**

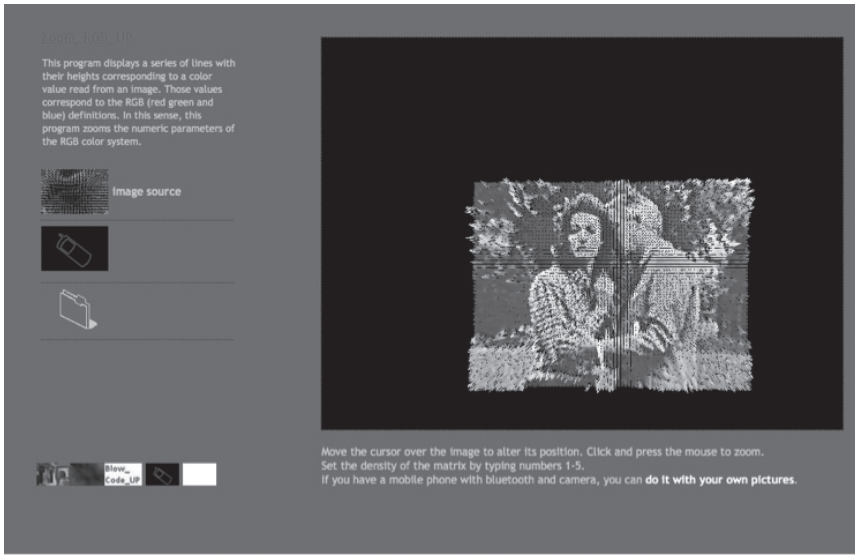

Figure 4. "//Code_UP" (2004)**

But what does "//**Code_UP" tell us about relations of power and their disruption in Latin America? What does it have to do with the commodification of software, or the exploitation of its labor? We might speculate that by inscribing programming code on the surface of the artwork Beiguelman demystifies and possibly democratizes the programming process, promoting a do-it-yourself spirit that may encourage viewers to become artist-programmers, thereby broadening, and even politicizing, digital participation in Brazil and elsewhere. Beiguelman makes her source code available for download for other artists to adapt and modify (Figure 5). Although the gesture remains partly symbolic since most viewers will not download and alter the code, her inclusion of source code files (and not just executable files) endows "//**Code_UP" with contestatory potential and demonstrates a stance critical of black-box proprietary programming that keeps code as a hidden and valuable commodity. By stripping its opacity, Beiguelman shows how code "works" and exposes it to interpretation and critique. There is another "hidden" human aspect to code as well: increasingly, high-tech computer workers and programmers in Brazil, Mexico, and other Latin American countries are working for companies from the

Global North who are outsourcing their "low-level" coding. Bringing code to the fore renders the labor of code workers, and their potential exploitation, visible.

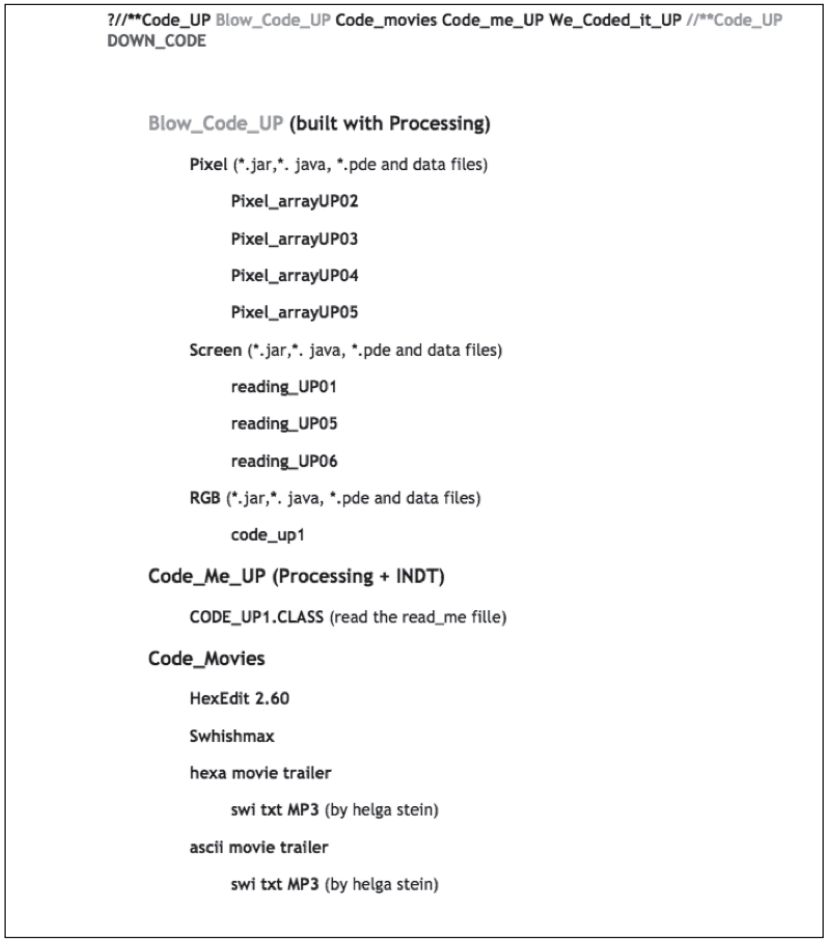

Figure 5. "//Code_UP" (2004)**

As we have seen, Beiguelman establishes, by analogy, a link between the intense awareness of both mediation and the epistemological limits of the mediating apparatus presented by Antonioni, and the obsolescence and unknowability of the deepest levels of computing. Engaging with digital technologies of perception, she enacts a metacritical examination of the computing machine's methods and processes

by breaking down images, revealing the code that underlies them and the numerical bases of that code. Whereas *Blow-Up* represents the possibility of a photographer as individual artist to intervene or construct reality, thus revealing both photography's political possibilities and its material limitations, Beiguelman's "//**Code_UP" instead exposes the inner mechanisms of computing by translating the images from Antonioni's film through a digitizing process into binary code. This numeric representation of what once were filmic images might be said to counter the growing domination of surface aesthetic over deep structure.

Beiguelman's piece also emphasizes the politics of form by re-calibrating the viewer's expectations of the poetic, eschewing overt signification, and encouraging instead that the user examine and download fragments of the work's programming, which can then be applied to transform images of the user's own choosing. In fact, the free and open source program used by Beiguelman—called "Processing"—was built specifically to facilitate coding for artists who are not programmers. Users are able to download Beiguelman's routines and data files, and modify them with "Processing," potentially making each viewer a creator. Certainly, as Geoff Cox has observed, it is naïve to believe that facilitating access to code automatically results in the subversion of market forces, since "releasing source code . . . represents a number of ambiguities relating to freedom, both a belief in open standards and yet also a cynical business move to capitalize on sharing and free labor" (77). Viewed through a pessimist lens, it may seem that despite efforts by artists such as Beiguelman, both property rights and labor exploitation are always-already encoded into software practices increasingly beholden to market forces and e-capitalism. Code's instability and undecidability, however, may signify hope.

Ultimately, the digital is shown to be fragmentary and unstable, but this lack of stability is not seen as problematic, rather as reflecting our contemporary state where meaning refuses to be fixed, as Beiguelman observes: "The fragmentation of distributed interfaces and the mix of words and symbols in alphanumeric writing code create a non-phonetic 'alphabet' that operates through sharing and sampling, situates itself in public spaces, and participates in the instability of contemporary life" ("Nomadic Poetry" 286). Beiguelman therefore offers access to the deeper layers of machine functioning, locating the poetic within computer code itself and making that code available in a freely-circulating non-commodified form for everyone to enjoy.

Case 2: Antonio Mendoza (Cuba) "subculture.com" (2003)

In *The Laws of Cool* (2004), Alan Liu coins the term "viral aesthetics," referring to a type of net.art that blurs the boundary between creation and destruction, legal and illegal, self-replicating virus and code, error and functioning program, works in which "destructivity and discontinuity are virally embedded within life as the possibility of creativity and continuity" (348). Liu describes the viral aesthetic as a practice of "creative destruction" which is embedded within a new avant-garde:

> The most avant-garde arts of the age of knowledge work break out of the confines of the arts to perform "destructivity" in corporate and other dominant social sectors directly. . . . the idea of "auto-destruction" is transmitted into domains of society external to the arts as "viral"—that is, as a destructivity that attacks knowledge work through technologies and techniques internal to such work. The genius of contemporary viral aesthetics is to introject destructivity within informationalism. This, we may say, is very cool. (331)

Situated at the intersection between art and hacktivism, the overtly political projects displayed in Antonio Mendoza's website "subculture.com" tap into such a viral "aesthetics of mutation and remixing" (Liu 324), at times even courting an appearance of criminality, and still deeply concerned with digital materiality. Like the Belgian collective Jodi (which Liu discusses at length in his book), Mendoza's work could also be categorized as browser art, a subgenre of net.art which "recognizes the authority of the Web browser as the great contemporary art frame but refuses to cede the final word on the look and feel, or even the function, of this frame to the technical, corporate, mass media, and other forces that produce the dominant browser programs" (348). Instead of yielding to the imposition of the commercial browser, as Liu argues, browser art defamiliarizes, subverts and proposes alternate browsers in order to challenge the corporatist power structures already ensconced with the Web.

Decidedly disruptive, Mendoza creates works that undermine traditional mass-media power relations by negating and parodying consumerist messages and market imperatives, ironically commenting on mainstream culture and politics. But whereas Global North artists such as Jodi, Antiorp or Absurd.org are primarily concerned with

exploring the intersection of poetry, code and illegality from a deterritorialized—and at times ahistorical—perspective, Mendoza anchors his work in real geographies and global events (such as the War on Terror). Let us consider Mendoza's work as displayed in his "subculture.com" website. The first signal that something may be amiss is that search engines do not report the content of the site, although they do index it. Mendoza's website uses a robots.txt file to block website crawlers (such as Googlebot) used by Google and other engines to report on website content, even as the website itself remains accessible to the public. This act in favor of privacy also positions "subculture.com" as a suspicious website whose protocols signal willful subversion by its owner who, in addition, is never identified in the website by his name, email address, or any other marker. Anonymity decouples on- and off-line identity and signals a desire to claim certain rights that the Electronic Frontier Foundation and other groups advocate for, such as the right to anonymous speech and anonymous browsing, or freedom from intrusive corporate advertising. By denying categorization, Mendoza's website implicitly advocates for a rejection of global, national, corporate and web-based centralization and organization. Given that a great deal of Internet governance resides within the United States' Department of Commerce, and that other Web governing agencies such as the Internet Society are based in the United States as well, coupled with the Snowden disclosures in 2013 about massive global surveillance of Internet and communications by the NSA, Mendoza's gesture seems defiant in its (symbolic) refusal to adhere to Internet protocols.

The contents of the site appear to equally resist control, dominance and governance. Upon accessing the website, a grey screen with the title, "subculture," and a subtitle that descriptively frames Mendoza's project, greet us: "corporate.logo.sabotage."[6] In the lower portion there are a series of options one can click on, with names such as "indiction," "total," "extreme.anime," "all-teen," "disco," "disorder," "image.pirate," "mr.tamale," "idiot.robot," and "triptych.tv," linking to Mendoza's net.art projects. The user never gets a chance to click on them, however, since immediately a new browser window opens to the full size of the monitor and a rapid succession of images and noises aggressively invade the screen.

In fact, the site "subculture.com" is structured as digital "mash-up," a relentless succession of images syncopated to a disorienting techno rhythm and overlaid by re-mixed sounds, text and voices taken

from international news and media sources. The dizzying speed and the constant movement of the screen images (they vibrate side to side with a rapid frequency) induces visual, aural, and cognitive discomfort. Many of the images, obviously selected to effect a wholesale critique of United States foreign policy, are taken from the terrorist attacks on the World Trade Center and from post 9-11 events such as the Abu Ghraib torture scandal (including the infamous photo of private England holding a naked prisoner by a dog leash), as well as re-mixed footage from Osama Bin Laden and other Al Qaeda individuals. Mendoza promiscuously draws on images from a vast array of sources, ranging from CIA, Department of Justice, and other agency logos, to photos of jets, tanks and other military machines, as well as pornography, commercial spam, and other signs of contemporary decay, the detritus spawned by the neoliberal New World Order (Figures 6 and 7). Readable text (other text flashes by too quickly to be read) serves as ironic commentary. For instance, above a photo of American fighter jets one can read the string, "the.unmarked.grave.of.discarded.lies," a clear reference to the web of lies articulated in recent decades to bolster American militarism, and to the human toll that resulted from such policies.

Figure 6. "subculture.com" (2003)

Figure 7. "subculture.com" (2003)

Mendoza's deployment of a self-reflexive code-aesthetic that incorporates dark humor and disorder to parody the established Internet global capitalist order through digital disruption, enacts an ethos of hacktivism whose aim is to distort, fragment and expose the ideological underpinnings of media images through a process which defamiliarizes and disorients the viewer. Without actually showing its source code, Mendoza hints at the computer code that underlies his work, by offering glimpses of its functioning, and suggesting how computers might be hacked into, interrupted and compromised through cyber-warfare tactics. Additionally, text is overlaid on abstract patterns to give the appearance of a software or system break-down or glitches (Figure 8). Throughout "subculture.com," Mendoza presents code as a dangerous and menacing spectacle, turning his artworks into virally replicating and self-propagating remixes, a rapidly spreading digital contagion.

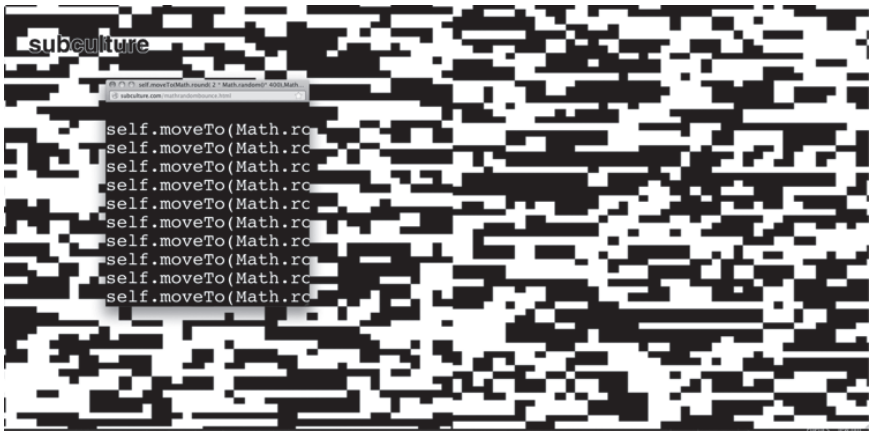

Figure 8. "subculture.com" (2003)

Of course, despite its close alliance with hacktivist and Spam art and its in-your-face rawness, Mendoza's code-inspired pieces do not break any laws, and in that sense, their illegality is merely performative. Furthermore, the allusion to code in "subculture.com" is neither to "codework" poetry nor to executable code per se, although the website establishes a relationship between surface objects (including images, sound and script), and its underlying code. While Mendoza's work, as it appears on-screen, is not in any sense "readable" as code by the machine, it does reflect with a simulated degree of transparency some of the characteristics of the code that makes it function, foregrounding both process and mediation as competing components of a project which attempts to realistically mimic code hacks, viral infections and computing mayhem in its performance of disruptive aggression against hegemonic mainstream media systems.

The performance of criminality enacted by Mendoza's use of code arguably opens up the possibility for real resistance: "subculture.com" offers a glimpse into how the Internet's capacity for surveillance and control can also be turned in on itself, providing a model to rethink oppositional strategies that intersect the areas of art, hacking and activism. In this sense, although Mendoza presents code itself as a threat, he also displays ways of rendering code into a weapon for resistance, or criminality, since, as Rob Kitchin and Martin Dodge describe in *Code/Space*:

> narrowly conceived notions of everyware [ubiquitous software] as the building blocks of a future Big Brother society fail to account for the myriad ways in which software is resisted, reworked and reappropriated in everyday life. Not least of these reworkings are the raft of new criminal opportunities opening up through the creative, yet malicious, manipulation of code. (112)

Mendoza's exploration and deployment of code is less abstract than viscerally and materially grounded. In a very material sense, Mendoza's work inhabits the violent network it depicts, reflecting it aesthetically by mashing up and condensing an assortment of digital detritus collected from the Internet, such as pseudo-code fragments, degraded photographic images, vibrating and flashing text, creating a virtual performance that presents the digital itself as a spectacle of dystopia, degradation and decay. As Liu has observed in regards to Joseph Nechvatal's viral-inspired computer art, such recombinant and destructive art expropriates media images to form creative (de)compositions. Nechvatal's artistic statement is likewise applicable to Mendoza's work: "images of mass annihilation wrought by technology now provide the major context for our art and our lives. With profoundly disturbed psyches, modern people encounter their existential fear in the atom, for when technology relieved much of man's fear of nature it replaced that fear with one of technology itself" (qtd. in Liu 332). Mendoza's viral art simulates hacking directly into the viewer's computer by unexpectedly causing a rapidly proliferating number of windows of various sizes to uncontrollably open, multiplying pop-ups that display anything from terrorist messages to pornography, thereby "present[ing] us with a dizzying metacollage of images and sounds that blend, almost obscenely, icons from politics, industry, pornography, religion, fringe groups and terrorism" (Netscopio), and which can only be closed by force quitting the browser, or by shutting off the machine altogether.

With this aggressive pseudo-hacking, Mendoza makes the viewer viscerally aware of the subversive possibilities of the digital, displaying images in dizzying speed and destroying notions of browser control. The user is flooded by contradictory sensations: of vulnerability and chaos, pounding excitement and overwhelming nauseous anxiety, intense participatory involvement and fearful alienation, all of it calculated to reveal the double-edged nature of the Web in all its utopian and nightmarish possibilities. By disrupting the user's voyeuristic

browsing and implicating him in participating, at the very least in a frantic attempt to close down the proliferation of inappropriate pop-up windows, Mendoza demonstrates that there is no real safety online, only a field for action, alternatively repressive and/or liberating. One must assume responsibility for one's browsing, as images of pornography or terror are not gratuitous spectacle but imply a real cost. Through its hacking aesthetic, Mendoza's work lays bare the conditions of its production, establishing a productive tension between mediation and immediacy. The political purpose of such partial transparency, as Raley has observed, is to apply a corrective to counter the "tendency to regard the work of art as separate from the work of software engineering. . . . situating code on the interface complicates the notion that a program is merely a tool with which to produce the 'real' art" ("Code.surface || Code.depth").

Case 3: Mitzi Olvera: Live Coding Performances in Mexico City (2010-14)

Live coding is an art form closely related to code poetry and net.art but grounded in live music and performance. Created in the United States circa 2000, live coding is a new discipline in electronic music and video that combines algorithmic composition and improvisation during live, on-the-fly programming jam sessions. The coders generate real-time electronic music and display the code on large screens for the audience to see, accompanied by visual effects, and sometimes, by the spectators' own dancing (especially when the venue is a nightclub).

The audience at these public events is comprised of both programmers able to appreciate the elegance, modularity and efficiency of the code on display, and non-programmers who focus on the visual and aural virtuosity of the performance, engaging with it on a more embodied, less technical level. The real-time modification of running algorithms by the live coding artist is similar to improvisational riffing in music, and allows for the irruption of the contingent in the form of programming errors and unexpected glitches such as computer crashes and other feedback mechanisms that alert the coder that something is amiss. Audience feedback is also immediately incorporated into the performance as part of a collaborative programming process.

Reminiscent of the process-oriented Conceptual Art of the sixties, the real-time nature of live coding places the role of the programmer-musician front and center in the digital environment, demonstrating the possibilities of creative collaboration and integration between human and computing systems, but also its possibility for disruption and dysfunction. Moreover, live coding has an added underground, subcultural combative edge. Thus while many live coding events emphasize solo performances, others are presented as duels or battle-royals between programmers. A recent event in Belgium was announced, somewhat tongue-in-cheek, as "13 rounds of hard typing action till Code Out; For the World Programming Federation Fingerweight Belt" (Nilson 112). While such antics may only be a pose of subversion, on other accounts live coders openly defy market consumerism, deliberately staying on the non-lucrative margins of net culture, remaining averse to corporatization and hostile to any attempts to commercialize live coding practices. Consequently, the live coding community has embraced the Creative Commons, and live coding software such as SuperCollider or Fluxus are free and open source.

Mitzi Olvera is representative of Mexico City's burgeoning live coding scene, where she often participates in friendly on-stage duels against other live coders in a technological version of the exquisite corpse (Agencia N22). Moreover, Olvera often works as part of a two-person team with other designers, such as Mexican coders Alejandro Franco and Jorge Ramírez, and Colombian coder Alexandra Cárdenas. In a performance, one coder creates the music and the other the visuals (Olvera specializes in the latter), aiming for a collaborative rather than combative performance. Some of Olvera's collaborators have formed groups of their own; for instance, Jorge Ramírez is part of "Mico Rex," a live coding duo (with fellow Mexican Ernesto Romero) who have also produced traditional formats (CDs, MP3s). Tellingly, the "Mico Rex" website (Figure 9) presents itself in a viral art style reminiscent of Mendoza's "subculture.com," although lacking any overtly political content.

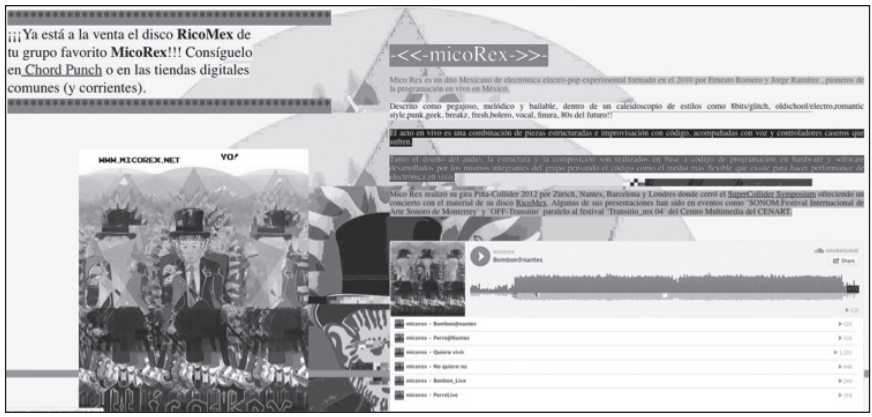

Figure 9. "Mico Rex" (2013)

Mitzi Olvera has performed in a variety of venues, including festivals, clubs, art galleries in Mexico City, and more recently (August 16, 2012) at the Museo Universitario de Arte Contemporáneo (MUAC) in Mexico City's UNAM campus (Figure 10). Mexican-style live coding is considered to be a slightly "rougher" variety which begins from scratch, not relying on any pre-programmed material, and slowly builds to greater visual and aural complexity as the performance intensifies. Olvera begins her performances with a blank screen, and the music and visuals emerge, from scratch, one line of code at a time. The instantaneity and live presence of the slow-building performance engages the audience, providing a sense of participation in its construction, more so than in other styles in which coders patch pre-written segments together. Olvera overlays graphics on the coding window, demonstrating her dual competence as artist and coder. Impressively, Olvera remains engaged on a variety of sensorial levels: synchronizing the visualization through abstract shapes and colors with the musical score, and integrating (when possible) audience feedback, as the live programming builds toward a crescendo.

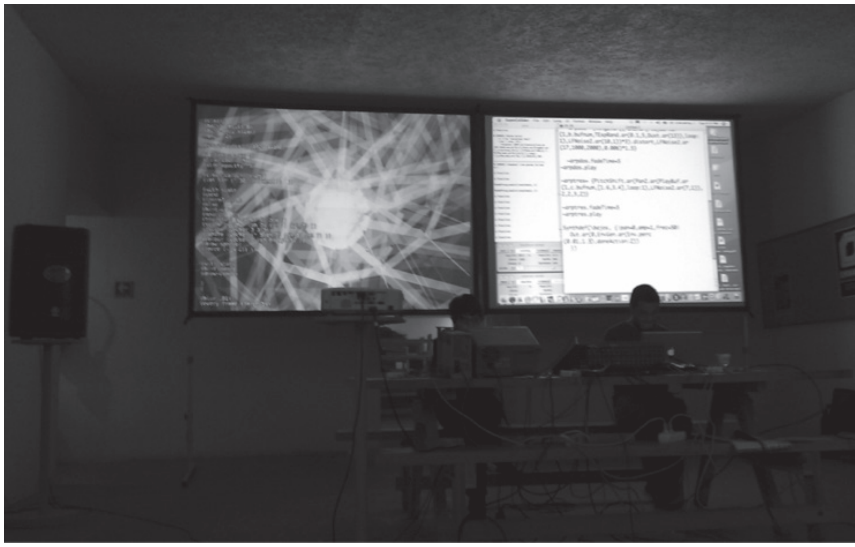

Figure 10. Mitzi Olvera: Live Coding in Mexico City (2012)

The fluid and flexible nature of Olvera's live coding style exemplifies how code as performed live might sidestep the results-driven determinism associated with commercial profit-centered programming: here the chain of commands, the rigid following of instructions toward a predetermined end is replaced with a slow meandering that builds its effects through improvisation, introducing a ghost-in-the-machine effect as cold utilitarianism is replaced with a warm programming style attuned to audience response (Figure 11). Furthermore, Olvera embraces the contingent, embodying what live-coding guru Alex McLean describes as a re-humanizing of technology, as "live coding places the human right back in the [digital] creative process so you can't really call [this type of art] computer generated anymore" (Cox 63). Indeed, a symbiotic relation between hardware, software and the human might leverage coding against the encroachment of an increasingly dehumanizing web capitalism. As Cox observes, "once software is defined as not only the program code but also the other materials required for the program to run, programmers become an integral part of the action. The act of coding becomes a prototype for action in broader terms, which includes a critique of the commercial imperative of software development and also the normative social relations associated with this" (63).

Figure 11. Mitzi Olvera: Live Coding in Mexico City (2011)

The sharing spirit of the live coders and the inherently collaborative nature of the works themselves are exemplified by the move toward free and open source code. Olvera, like other live coders, archives her performances on sharing sites such as Vimeo, or YouTube, and often uploads her code so it may be copied and modified. In that sense, Olvera and other live coders represent a direct challenge to notions of property and ownership. Granted, some live coders have placed recordings of their music for sale (as is the case with "Mico Rex"), but even in those instances they do not deal with major record labels, but with small Internet operations.

Live coding artists' real-time interaction with code and audience entails an erasing of boundaries between the coder and the code, process and finished art, performer and spectators. Indeed, it might be argued, as Cox does, that the collective aspect of live coding practices "demonstrate[s] the potential for the recomposition of collective action" in the twenty-first century (68), grounding such performances into local venues such as art galleries and clubs, reminiscent of the raw and noncommercial origins of punk garage bands in the sixties and seventies. As such, live coding might well be tapping into a new sense arising out of the times of late capitalism that collective action must be

reclaimed, so that as Cox argues, "live coding can be seen to reflect present conditions, in which our lives seem to be increasingly determined by various scores and scripts but the possibility exists for more expansive conceptions of collective action, or more positive implementation of general intellect, and as indeterminate as one of the events itself with its flaws and uncertainties of live performance" (65).

Conclusion: Code and the Corporatization of (Latin American) Cyberspace

Corporate interests in Latin America (comprised of national and international companies and consortiums) are busily exploring the many avenues to amass capital and resources through new media exploitation; for instance, by controlling and charging for (previously gratuitous) Internet content, restricting access to free information and capitalizing on tools originally developed without commercial interest (blogs, YouTube, social media). The artistic code practices I have examined may provide one way to counter such bleak prospects, by disrupting the penetration of capitalist interest into Latin American cyberculture, or perhaps by creating spaces that remain free from corporate interest. Moreover, code practices may have a special role to play, for as Hayles astutely observes, "strategies can emerge from a deep understanding of code that can be used to resist and subvert hegemonic control by megacorporations," in essence, fighting code with code (*My Mother* 61). Such understandings of code and code-informed practices, whether we call them hacktivism, digital zapatismo, dot-communism, digital artivism, or electronic civil disobedience, are being deployed to virally combat forms of e-capitalism which are also spreading with viral velocity. By understanding the complex abstractions of code, virtual and material resistance can be enacted against the onslaught of advanced, informational global capitalism. Among the possible forms of resistance, art is the least aggressive but not necessarily the least visible or effective, and perhaps it is the best placed to creatively imagine a kinder, alternate vision for the future. Codework, code poetry, net art, live coding and similar non-commercial practices undermine the purely instrumental reasoning found at the core of many other technoscientific projects, specially those aligned with late-capitalism's drive toward unnecessary and unbridled consumption, or with militaristic expansion.

As I have attempted to show through the work of Latin American artists, codework represents a real possibility for integrating aesthetics and political critique in digital environments. Of course, we should remain circumspect, since, as Hayles muses, "code is not the enemy, anymore than it is the savior. Rather code is increasingly positioned as language's pervasive partner. Implicit in the juxtaposition is the intermediation of human thought and machine intelligence, with all the dangers, possibilities, liberations, and complexities this implies" (*My Mother* 61). At the very least, Latin American codework artists challenge the boundaries of programming, art, and activism and, in the process, redefine the politics and aesthetics of computer code.

University of Illinois at Urbana-Champaign

NOTES

[*] I would like to express my gratitude to Eugenio Di Stefano and to Lotte Buiting for their generous and attentive reading, as well as their valuable comments to earlier drafts of this essay.

[1] The popularity of "codework" is growing, as shown by a recent Code Poetry Slam 1.0 (November 20, 2013) held at Stanford University's School of Engineering in conjunction with the Department of Literatures, Cultures, and Languages, to be followed by a second event in 2014.

[2] A high-level language is one that is far removed from machine language, abstracted so that it uses a fair amount of "natural" language and is easy to read and program in.

[3] Code art recalls other critical redeployments of science and technology by artists of previous avant-gardes, such as Francis Picabia's mechanomorphic drawings and diagrammatic poems, Marcel Duchamp's ready-mades, Mexican writer Manuel Maples Arce's radio poetry, musical experiments by John Cage and other Fluxus artists, Raymond Queneau's randomly generated poetry (Oulipo), Brazilian concrete poetry by the *Noigandres* group, and the process-oriented writing of the L=A=N=G=U=A=G=E poets (Bruce Andrews, Charles Bernstein, Ron Silliman et al.), all precursors working within the constraints of a mechanical, computing or algorithmic aesthetic.

[4] The Cortázar story, first published in *Las armas secretas* (1959), was translated into English as "Blow-Up."

[5] Beiguelman's website is in English.

[6] The subtitle changes with each visit, typically following similar lines. Another example is "angrier.filthier.better."

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Palabras clave: *Codework*, poesía en código, *live coding*, *net art*, cibercultura, América Latina, arte viral.

Date of Receipt: March 3, 2014
Date of Acceptance: May 9, 2014