Rachel Greene

Internet Art

Thames & Hudson world of art

For my dear parents, Professor Mark I. Greene and Bella Greene

Acknowledgments

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Chapter 3 Themes in Internet Art

Infowar and Tactical Media in Practice

The 1998 instalment of the international festival Ars Electronica revealed a truth at the heart of the internet – that beyond the rapid flow of information and increased ease of interaction and communication, the global economy, which was thriving in large part thanks to the boom in the technology sector, was now defined by information as much as if not more than by physical commodities. The internet's capabilities to produce, exchange and duplicate information in largely anarchic pockets put it at the centre of debates about economics, networks and information.

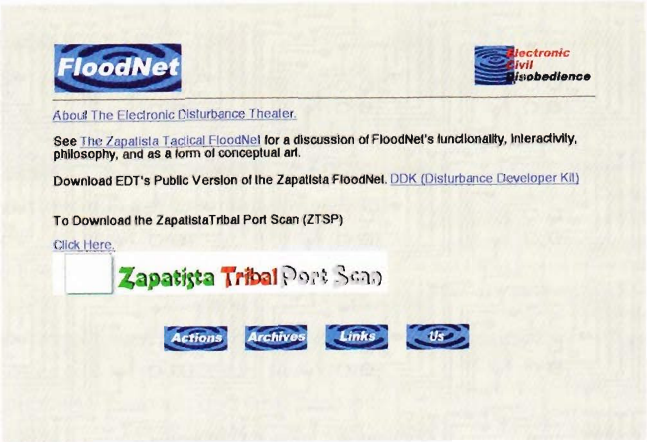
The festival, which took place in September at its usual location in Linz, Austria, represented the beginning of an intense period in internet art discourse and production. Every year, Ars Electronica chooses a theme around which to organize its symposia, installations and related events. Whereas previous years had memorialized the expansion of net culture with optimistic themes like 'Welcome to the Wired World', 'Endo Nano' and 'Intelligente Ambiente', 1998's theme was the more ominous and belligerent 'Infowar'. There were a number of spectacular, high-profile installations and interventions presented at the festival, and their examples deliberately blurred lines between art, activism, parody and politics. While the 'Infowar' symposia had been concluded by mid-September, its participants would find themselves embroiled in a number of far-reaching events and campaigns during the following year. These would culminate with *Toywar*, which Wolfgang Staehle called one of the 'greatest works of the 20th century'.

'Infowar' examined how informational, social and political phenomena interact. Gerfried Stocker, the festival's creative director, described the title's significance in an introduction to the 'Infowar' mailing list:

Carlo Zanni, *Landscape, Untitled Napster (alias)*, 2001. Napster, the well-publicized file-sharing service started by an American college dropout in 1999, is rendered iconic in this oil painting. This brand functions as a matrix in which values and desire intersect: Napster is an emblem of internet innovation and peer-to-peer ideology.

Increasingly the vital significance of the global information infrastructure for the functioning of the international finance markets compels the establishment of new strategic objectives: not obliteration, but manipulation, not destruction, but infiltration and assimilation. 'Netwar' as the tactical deployment of information and disinformation, targeted the human mind. These new forms of post-territorial conflicts, however, have for some time now ceased to be the preserve of governments and their ministers of war. NGOs, hackers, computer freaks in the service of organised crime, and terrorist organisations with high-tech expertise are now the chief actors in the cyberguerilla nightmares of national security services and defence ministries.

'Infowar' had its counterpart at the grass-roots level in the influential term 'tactical media', articulated by Geert Lovink and David Garcia in 1994, frequently used on mailing lists like Nettime, memorialized in essays such as 'The ABC of Tactical Media' and 'The DEF of Tactical Media', and expanded upon at the Next 5 Minutes conferences in Amsterdam. 'Tactical media' was inspired by 1970s 'tactical television' practices, and in particular by French theoretician Michel de Certeau (1925–86), who famously used 'tactical' to describe the invisible practices of consumers in the course of everyday life. Garcia explains: 'We theorised that the revolution in consumer electronics had transformed these tactics from invisible into visible practices. Turning tactical media into one of the primary ways in which people were becoming the subjects rather than simply the objects of modernity.' 'Tactical media' was an individual-centred approach to critical intervention that utilized the capabilities of consumer devices; and it had enormous resonance for many artists working with emergent technologies.



99 Electronic Disturbance Theater, *FloodNet*, 1998. *FloodNet* differed from many of ®TMark's anti-corporate campaigns in its engagement with government-specific targets. Part conceptual art and part performance art, *FloodNet* protests reclaimed internet space with acts of 'electronic civil disobedience'. It also contributed to *The Twelve Days of Christmas* campaign, which helped etoy to win its battle with dotcom eToys (see p. 126).

One tactical technique manifest at Ars Electronica was hacking. Hackers were set up with equipment in tents on the lawns outside Brucknerhaus, a festival hall in Linz, where they chatted with visitors about their ethics of anonymity, collaboration, evolving programming standards and open-software libraries. Chiefly expert computer and programming enthusiasts, hackers gained a sinister reputation after several high-profile cases in which they gained unauthorized access to systems for the purposes of corrupting data or stealing information (these kinds of hackers are called 'crackers'). While the general population may have been wary of how hackers wielded their powers to program across and beyond standard security measures, no one expected that an internet artist, Ricardo Dominguez (b. 1959), would receive death threats for his Ars Electronica project. Indeed, far more shocking than the ability to crack certain kinds of programs were the terrifying messages left for Dominguez in anticipation of his planned performance with the Electronic Disturbance Theater [99].

Dominguez, who founded the Electronic Disturbance Theater with Stefan Wray, Brett Stalbaum and Carmin Karasic, designed the performance group as an heir to activist and theatre traditions like those of collective Gran Fury and playwright Bertolt Brecht respectively. Like many works of net-based performance, the Electronic Disturbance Theater uses internet functionality to extend the body's field of action. Part of a widespread online campaign often referred to as 'Digital Zapatismo', Dominguez's project, called *SWARM*, developed the activist vocabulary of dissent by interfering with the web sites of Mexican President Ernest Zedillo, the Pentagon and the Frankfurt Stock Exchange. During *SWARM*'s designated timeframe, a broad base of net users occupied some of the targeted sites' resources. Not only did Dominguez receive a menacing phone call in his Linz hotel room warning him to stop the performance, but the Pentagon took his project seriously, to the extent that the US government agency released a counter-applet (applets are small applications that run off other software, often used in conjunction with web browsers) to neuter *SWARM*. However rhetorical Stocker's premise of 'Infowar' may have seemed in writing, in practice governments and military reacted to disruptions in their online analogues with force. Whether the Electronic Disturbance Theater considered the project 'art' was irrelevant. An action in the field of mass media could not rely on the ethics of more open or more specialized zones, like art festivals.

®TMark, in attendance to judge the prestigious InfoWeapon award that year, used its extensive mailing lists and spotlight to raise awareness of the campaigns and counter-strikes against the Electronic

Disturbance Theater. This alliance was followed by another surprising gesture: the awarding of the InfoWeapon cash monies and honours to the small Mexican town of Popotla. Twentieth Century Fox had filmed some scenes of the blockbuster film *Titanic* in Popotla, building a giant cement wall that cut the village off from its beach, and chlorinating the crop of sea urchins that Popotla had fished for decades. In reaction, Popotla villagers decorated the wall with rubbish and made a media spectacle out of it. While Ars Electronica awarded *Titanic* a prize for its special-effect techniques in the film, ®TMark honoured Popotla for its 'symbolic low-tech resistance to real high-tech destruction'. The two strategies at play in this decision characterize the work of ®TMark as a whole: institutional and corporate workings are cracked open, and issues of capitalist ideology are addressed.

Also in attendance was Mongrel, a Britain-based collective comprising individuals of diverse ethnic and racial backgrounds who effectively combine these tactics to expose dynamics of race and class. Mongrel had already gained an international reputation from its award-winning CD-ROM of 1996 *Rehearsal of Memory*. For this project Graham Harwood (b. 1960), a member of the group, collaborated with the inmates of Ashworth Mental Hospital to create a work about patient life using hypermedia, in which a map of patients' skin is linked to documentation of their lives as residents at the maximum-security hospital. The work, as described by Harwood in the CD's liner notes, challenged 'assumptions of normality and at the same time [confronted] us with a clean comfortable machine filled with filth, the forbidden and the demented, its hygienic procedures contaminated with the effort of excluded human relations'. CD-ROMs, compact and inexpensive, are easily distributed and straightforward to use. This choice of format underlined Mongrel's deliberate use of 'machines'; in *Rehearsal of Memory*, computer technology and production opened the doors and windows of a maximum-security hospital.

Mongrel's work took an important turn when the group began to make software and web sites, debuting *Heritage Gold* [100] freeware in 1998. *Heritage Gold*, part of Mongrel's Ars Electronica installation, *National Heritage*, found inspiration in Adobe Photoshop and questioned the supposedly neutral operations of graphics tools by creating an image-manipulation tool rich with class and race mechanisms. Instead of choosing colours from a palette – blue, green or cyan, for example – users would select from categories such as Caucasian, Black and Japanese. The

100 **Mongrel**, *Heritage Gold*, 1998

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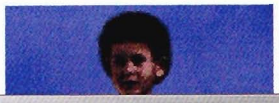
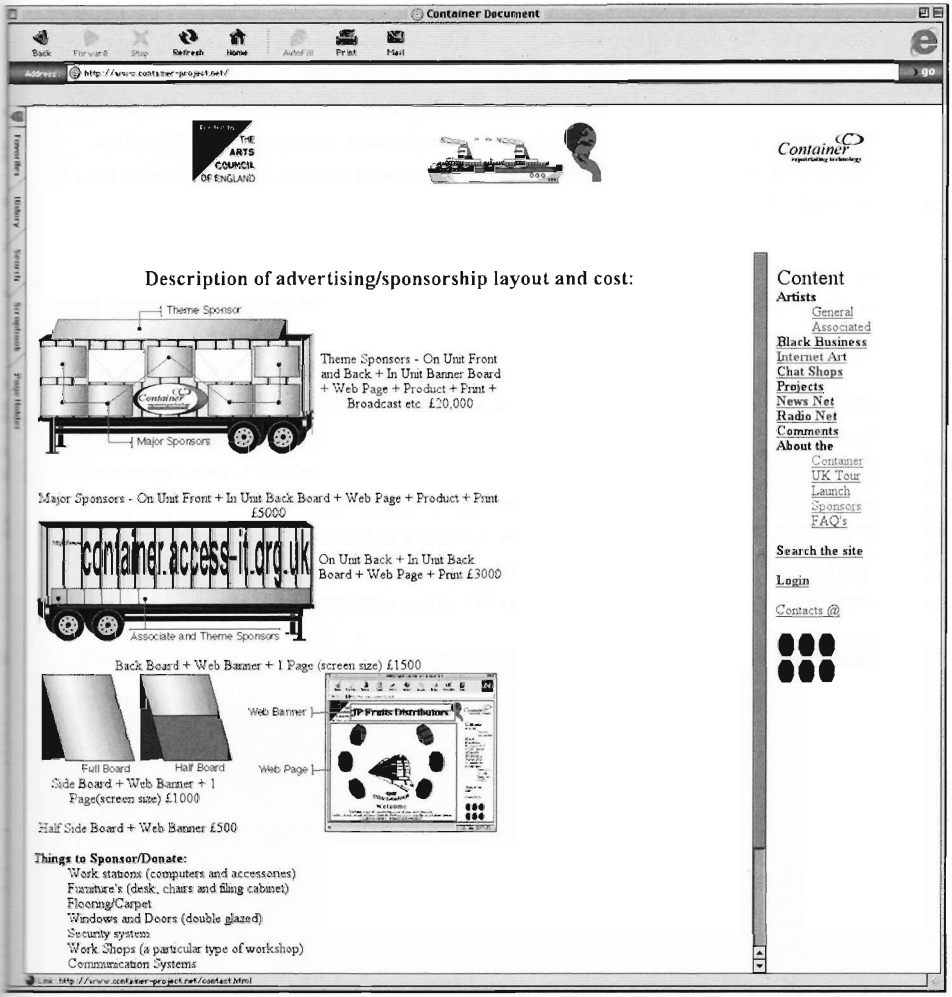


Go to "http://www.mongrel.org.uk/Natural/HeritageGold/index.html"

commands of Photoshop had themselves been Photoshopped, cosmetically changed to reveal an ideological basis for image production and manipulation. *National Heritage* consisted of a gallery installation of faces of varied ethnicities, sewn masks and appendages called *Colour Separation*, street posters and a newspaper. In an interview with Matthew Fuller, London-based Mongrel member Richard Pierre-Davis (b. 1965) explained his view of the confrontational mask images: 'I believe the mask to be one of the most defining aspect[s] of the whole project in more ways than one; the masks represent the mask that I always have to wear at the point of entry into Britain, it represents the mask that I wear repeatedly as I go about my everyday activities in this lovely multicultural state.... And then it also represent[s] the mask that a mongrel has to wear in sourcing resources for this project. So you see the whole *National Heritage* project is a constitution of the mask.' Mongrel's Matsuko Yokokoji (b. 1960) and Graham Harwood noted that the presentation of distinct and more racially ambiguous visages in *Colour Separation* shows how easily *Heritage Gold*'s mixing capabilities could suspend distinct racial categories into malleable data. Predicting – in tongue-in-cheek tone – a 'huge demand in the West for this software', they described *Heritage Gold* as part of a '[struggle] to find images that deal with the complexities of the kind of lives we are living now. There is no longer black or white....'

Harwood did more than extend the lineage of identity art politics into the net art sphere. He also described the philosophical stakes of technoart festivals and discourse:

Now, dominant racial and cultural groups in society act as audience to their own techno-cultural-media product. Bleached images of self-congratulatory ritualised distancing, symbolically install these groups as the right people to control, restrict, and censor Cyberland. Digital cloning has helped call into question accepted notions of originality and genius, allowing a re-evaluation of the codes of cultural production – just so long as this does not include the filth of uncomfortable social relations. Given the racialisation and elitism of most electronic art events, attendees might still think that underneath they're all still loveable. The multicultural lets-get-on-with-each-other-and-get-happy number has for a long time been one of the main tactics for hiding hard, difficult debate under a sixties-style love-in. Mongrel cultures have come too long a way in intellectual rigour to be fobbed off with a flower pushed up the barrel of their gun. This is as the 'Infowar' leaflet says 'a battle in which the power of knowledge is managed as a profitable monopoly'. Societies seem to have learnt nothing from the tragedies of this century



Mervin Jarman, *Container*, 1999. The *Container* – literally a shipping container on wheels – was a mobile media centre that travelled across Jamaica, comprising fourteen workstations and a networked server. The project, orchestrated by Mongrel member Jarman, was designed to take creative computer technology (and interactive digital media in particular) to the Caribbean's underprivileged, primarily youngsters, and to equip them with communicative skills and tools.

[the twentieth century] that have been co-founded by the military technologies from which new media rises. Are we about to remake the cultural spaces for the arms dealer class that profited before from war, slavery, migrant-labour, poverty, death, and disease? Or are we to dirty up their future and complicate their desires with filth?

In conjunction with the storm of events around the Electronic Disturbance Theater, the impact of Mongrel's installation and the declarations of its members heightened the sense that new technologies provided strategies for realizing agitational goals.

Over the next fifteen months, the face-to-face encounter at Ars Electronica 1998 between ®TMark and etoy, the largely Swiss

troupe that parodied dotcom brands, would prove central to the high-profile tactical media event known as *Toywar* [102]. *Toywar* was the web site headquarters for a defensive campaign resulting from a legal dispute between etoy, which had been online since 1995, and eToys, a relatively new dotcom business, which aimed to dominate the online children's toy market. The latter used its substantial financial resources to sue etoy for its domain name, alleging that etoy's site contained 'pornographic and anarchic' content that threatened its business. The lawyers of eToys were successful in this regard, and at one point a court injunction shut down the etoy web site. Etoy solicited the support of ®TMark, THE THING, Rhizome.org and other lists: ®TMark assumed a leadership role and, following the call issued by etoy's Reinhold Grether for a 'new toy' to fight eToys, designed a game-esque campaign called *The Twelve Days of Christmas*. Gameplay included Electronic Disturbance Theater's *FloodNet* [99] applet, as well as emails, postings on the financial message boards about the debacle, all seeking to interrupt the toy-seller's web site and reputation during the busiest sales period of the year. The results,

102 **etoy**, *Toywar*, 1999–2000. *TOYWAR.battlefield* on the internet: showing some of the 2,500 TOYWAR.agents in January 2000, two weeks before eToys signed a settlement and dropped its lawsuit against etoy.

though it would be specious to ascribe them solely to the blitz of *The Twelve Days of Christmas*, were dramatic: following the involvement of thousands of outraged participants, the inflated price of eToys' stock fell by more than forty per cent, its web site was slowed for a time, and *Toywar* received enormous publicity from around the world. The bubble of the internet market was collapsing, and eToys declared bankruptcy after the lawsuit against etoy was resolved.

Of course, by posturing as corporations, sending out press releases and courting media attention, etoy and ®TMark were using some of the very material they wished to critique, and *Toywar* highlighted some of the paradoxes of politically progressive, parodic work. Acknowledging these paradoxes, focusing on the often hilarious transgressions and interchanges made possible by such positions, is part of their works' appeal. It seemed that while eToys exercised the legal rights granted to corporations in the United States, artists and like-minded people were also capable of media manipulation or the tactical use of media to create self-conscious, grass-roots, multi-faceted analogues of corporate power. That *Toywar*, despite its very real legal stakes and the substantial monies involved, was called a 'game' by its producers suggests a new dimension to art practices brought on by internet technologies. Using the premise of fighting against an enemy and defending space, as well as the *FloodNet* applet, and an element of performance, tactical media asserted itself as a method for seizing or reclaiming public space.

Toywar was an exhilarating and empowering struggle, but net art communities had been devastated by a more serious conflict in the spring of 1999: the NATO bombing of Kosovo. The notable absence of Yugoslavia-based participants on lists such as Nettime and especially Syndicate (its focus was on Eastern Europe) was accompanied by emails from those who still had internet access, full of desperation, fear and anger, as well as by documentation of the damage to infrastructure and civilian targets. While concern for friends and colleagues was paramount, the negative effect of the NATO campaigns on internet capabilities and independent media also became a topic for discussion. As Geert Lovink wrote about the silenced voices from Southeast Europe: 'Small media may be "tactical", but they are also easy to shut down.' Though the initial response among most communities was to share information and create possibilities for independent reporting, like the hosting of the B92 Radio Station (based in the former Yugoslavia) on Real Audio servers, artists also began to make

103 **Trebor Scholz**, *79 Days*, 2003

works in response. Net projects about the 1999 bombing varied from theatrical works like Teo Spiller's *I Was a Soldier on Kosovo* to historically based works such as Miklos Legrady's *Krematorium*. German artist Trebor Scholz's *79 Days* (started in 2001, although the web site was not launched until 2003) [103] consists of photos and videos of Yugoslavians presented without descriptive context, with hyperlinks conducting live image searches relating to various aspects of war. The artwork compares media debris about the war, likely culled from news sites, with Scholz's beautifully shot, high-resolution documentation of post-1999 Kosovo.

The reactions to the bombing of Kosovo and to *Toywar* were not the only efforts to make use of the mechanisms of new media forms. Many protestors, including those who participated in the 1999 Battle of Seattle (part of a protest against the World Trade Organization), mobilized via the internet to oppose International Monetary Fund and World Bank policies towards the debts of struggling countries. This widescale mobilization online for offline protests, of which *Toywar* was one example, set leftist advocates against stalwarts of the established marketplace and world order. These conflicts were elaborated in several instances as infowars.

Turn of the Millennium, War and the Dotcom Crash

In previous chapters we saw the emergence of discursive models, such as mailing lists, bulletin board systems and conferences that helped internet artists to build and sustain vital networks outside the art world and to generate fruitful relationships with both audiences and each other. A sense of autonomy or 'productive marginality', as Rhizome.org founder Mark Tribe called it, and the

practice of 'dialogue through work, as well as through communication', were central to the classical net.art scene, evident in *Net Criticism Juke Box* [51] or the *Mr. NetArt* competition [52]. The net.art community had maintained a general sense of intimacy and trust for several years. Vuk Cosic knew critic Josephine Bosma; Bosma knew Olia Lialina; Lialina knew and had collaborated with Heath Bunting. Colleagues, regardless of their opinions or behaviour, were just an email away, and likely to be seen at a festival in the near future. But as the internet expanded exponentially, and as participants found themselves in different places in their lives, perhaps with children, consumed by other events, as many were by the war in Yugoslavia, or by more demanding personal responsibilities offline, this sense of community began to give way. In an essay 'net.art Year in Review: State of net.art 99' for the net culture journal *Switch*, artist and programmer Alexander Galloway noted formal shifts, writing that 'net.art', the genre best known by the work of Vuk Cosic, Heath Bunting and Olia Lialina, was dead. Endorsing this view was a quotation from German net art historian Tilman Baumgärtel, who had written as early as 1998 that 'the first formative period of net culture seems to be over'.

As the millennium came to a close, many levels of change were afoot. For a start, there was evidence of growing institutional interest in net art. In 1999 the ZKM mounted its substantial 'net_condition' show, and Tate Britain and Tate Modern began commissioning net art. New York's Whitney Museum of American Art hired digital culture magazine *Intelligent Agent* founder Christiane Paul as an adjunct new media art curator, and announced that net art would be in the 2000 Biennial. '010101: Art in Technological Times' was scheduled by the San Francisco Museum of Modern Art to open in 2001. The Guggenheim Museum also commissioned online art and began its valuable 'variable media initiative', in which curator Jon Ippolito considered how to preserve and conserve ephemeral and contingent new media and conceptual artworks. Vuk Cosic, practically a folk hero in Slovenia, was selected as the country's representative at the Venice Biennale. Meanwhile, several years of optimistic internet culture had produced another kind of aura for net-based art. Dotcom design shops seeking to create more sophisticated or innovative sites for clients, began to support 'research and development' projects that were also considered art. As demand for web sites on the part of most businesses increased, so did the status of interactive design. At the same time, production tools

and coding standards became more sophisticated. While not everyone embraced high-production-value aesthetics, internet art's formal scope benefited from the new levels of expertise and decor. Finally, internet traffic and popularity were clearly on the rise: data at statistics web site Zakon.org maintains that the web hosted five million sites in 1998 and, by the end of 2000, there were more than six times that number, over thirty million registered web sites. There were simply a lot more people online interested in new media art, from college graduates who had studied new media art at programmes started in the mid-1990s, to computer-engineering professionals, who decided to bring their methodologies and skills in art production to legions of self-taught 'netheads'.

Still, even such expansive usage did not make it easier for independent new media organizations to succeed financially in America. They consistently struggled to develop viable economic models, and äda'web, which eventually came into the America Online portfolio, was shut down in 1998. Early portal projects like artnetweb, which had gone online in 1995, ran out of gas in around 1999. Non-profit platforms Rhizome.org and Turbulence.org struggled to secure funding from granting institutions. During the same period, in parts of Europe and Asia, new organizations received governmental support, and platforms multiplied. *CRUMB* and *Cream* were two new, European publications about internet art. In Delhi, India, a new media centre called Sarai, operating with the Waag Society and the Australian Network for Art and Technology, launched in 2001. Founded by a number of filmmakers and researchers, the centre hosts events and classes, publishes books of research, and runs a number of email lists focused on new technologies, images, radio and ethnographic topics.

Responses to the broadened climate varied. While some critics and artists would argue that the tightly knit communities of the 1990s had disappeared, leaving watered-down versions in their stead, others embraced more expansive and developed forms of programming, along with the challenges of maintaining and nurturing more diverse and populous communities. Not only had the audiences increased exponentially, but more sophisticated methods and resources for programming had evolved too. In 'net.art Year in Review: State of net.art 99', Galloway observed: *People want more than email. They want new interfaces. They want killer apps [an application superior to others in its genre]. They want to escape the offline. All art media involve constraints, and through these constraints creativity is born. Net.art (the jodi-vuk-shulgin-bunting style)*

104 **Maciej Wisniewski,** *Instant Places*, 2002

was the product of a particular technological constraint: low bandwidth. Net.art is low bandwidth through and through. We see it in ASCII art, form art, HTML conceptualism – anything that can fit easily through a modem. As computers and bandwidth improve, the primary physical reality that governed the aesthetic space of net.art begins to fall away. Today, plug-ins and Java are good. And software trumps them both.

Galloway's analysis was borne out in the work produced by a new wave of net artists who drew from software engineering, game design and the free-software movement. Skilled programmer Maciej Wisniewski has taken the legacy of browser art such as *The Web Stalker* into multiple dimensions. One of the artist's projects in this vein was *Netomat*, which debuted in an early form at Postmasters Gallery in 1999. *Netomat* took words typed by the viewer and searched the internet for relevant text, images and audio, flowing the results onto the screen without any adherence to traditional page format. While *The Web Stalker* is typically considered to have changed the way users looked at browsers and web sites as whole entities, *Netomat* treated the internet as a highly visual and multimedia economy from which one could gather elements and reorganize them independently. *Instant Places* (2002) [104], which is akin to a game-cum

-communication platform, is another project by Wisniewski. It worked by connecting dispersed so-called 'data places' (different computers connected to the network) to form a matrix that was free from the constraints of geography, time and place. *Instant Places* featured predators (hawks) and prey (mice), which were able to move between different data places and communicated via instant messaging – enabling them to recognize each other and gauge movement, distance and shape.

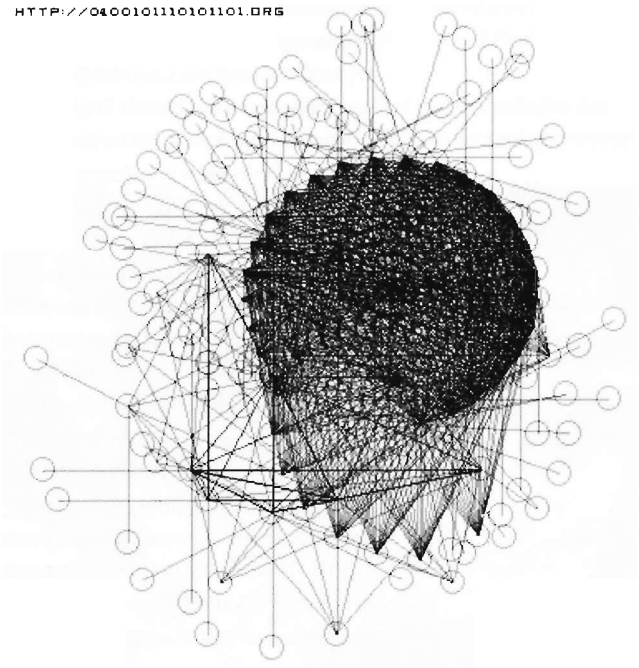
Data Visualization and Databases

Scrutinizing access and gathering of materials was one dimension of an important work called *Life_Sharing* (2001) [105] created by 0100101110101101.ORG and commissioned by new media curator Steve Dietz at the Walker Art Center's Gallery 9 in Minneapolis, Minnesota. Its title is a play on the term 'file sharing', in which parts of a hard drive are made available over an internet connection (many music-sharing applications rely on this technology). The project turned 0100101110101101.ORG's shared computers into an open 'server', or a computer accessible across the internet with no passwords or verifications needed. Circumventing the entrenched protocols of navigating a web site (and not engaging directly with its raw contents and the authors behind it), the collective adopted an aesthetic that left far less to the imagination, stating that 'the idea of privacy is obsolete'. A novel format for psychic autobiography (the project derives from the personal indexes of 0100101110101101.ORG's participants), *Life_Sharing* made available all kinds of computer data and documentation, from their net artworks to personal forms and email. In *Life_Sharing*, the artists designate the ever-replenishing documents and data as reflections of self and as art objects:

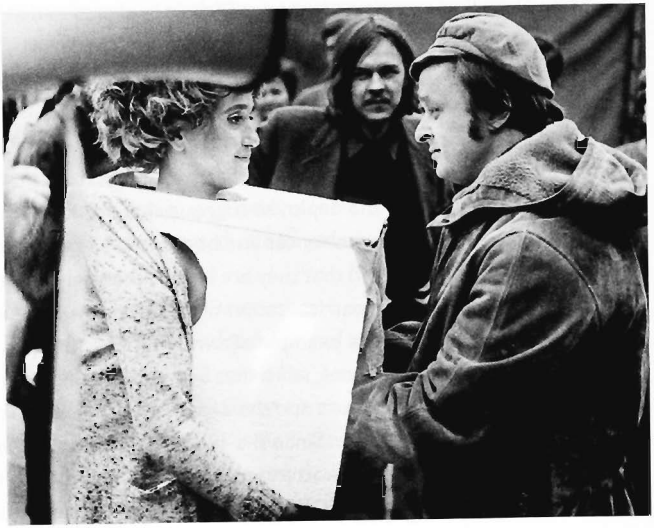
With a computer one shares time, one's space, one's memory, and one's projects, but most of all one shares personal relationships.... Getting free access to someone's computer is the same as getting access to his or her culture. We are not interested in the fact that a user can 'study 0100101110101101.ORG's personality'; rather, in the sharing of resources, it's a matter of politics more than of 'psychology'.... It is not only a show. It's not like looking at Jennicam [a well-known web site, started in 1996, in which a young American woman lets a web cam record her every domestic action]. The user can utilize what he finds in our computer. Not only documents and software, but also the mechanisms that rule and maintain 0100101110101101.ORG: the relations with the Net; the strategies; the tactics and the tricks; the contacts with institutions; access to funds; the flow of money that comes

in and goes out. All must be shared so that the user has a precedent to study. From this learning, concrete knowledge – that is normally considered 'private' – can be transformed into a weapon, a tool that can be reused.

0100101110101101.ORG's supposition that its computers' contents, framed by ideological intent, could be viewed, reused and deployed suggests that, for its members, human psyches, experiences and bodies can be reflected at least in part in data, and that they are indeed themselves aggregations of data. The theatricalization of a private computer's contents and workings is one example of a wider phenomenon – the theatricalization of all spaces, which has been developing via the rise of entertainment culture and the expansion of television media over the last forty years. Since the 1960s, a significant body of artwork in which media attention is a focus has elaborated on these themes. In fact, 0100101110101101.ORG's contention that 'privacy is obsolete' has an analogue in Valie Export's *Touch Cinema* (1968) [106], in which the artist walked around Vienna with curtains covering her breasts and encouraged passers-by to reach in and touch them. Export, who called *Touch Cinema* 'an expanded movie', sought to question the boundary between public and private space, as well



05 0100101110101101.ORG,
Life_Sharing, 2001



106 **Valie Export**, *Touch Cinema*, 1968. By using her breasts and a simple curtain to personify, dramatically, the dynamics of film consumption, Export also alludes to the functions of identification and self-expression. In a contemporary project that also creates an equivalence between media and self, 0100101110101101.ORG makes its hard drive, replete with email and private files, accessible to all users.

as the one-way structure of film. In *Life_Sharing*, this boundary is replaced with communication technologies, as file sharing and email both become entry-points into the work.

Self-reflection through the aesthetics of a medium à la Export is now well known via the contemporary popularity of reality television around the world. In *Life_Sharing*, a work in the reality-internet genre, the vérité of everyday functions (email, file organization and documents) gives birth to a new form of medial recording and what Ursula Frohne calls the 'media *mise en scène*'. Indeed, for those who understand the premise of *Life_Sharing*, the notion of voyeurism conditions many of the interactions one has while perusing the 0100101110101101.ORG web site. Granted, 0100101110101101.ORG is not conducting the kind of behaviour seen on most reality TV shows, nor is the user seeing televised images. However, the group's dissolution of the lines between colleague and spectator, participant and monitor, and public and private activity (such as email) in the name of transparency, is a politicized strategy, one akin to the open-source aversion to users' privately owned locked software. Those who do not want to comply with the stage that is the 0100101110101101.ORG site have no choice, however, although they are given oblique warnings in pop-up windows that preface the site. 0100101110101101.ORG members might argue that the internalization and permanence of observation now native to their web site is in line with standard security and dataveillance conditions on the internet.

Mediated information's porous, reflective and abstract qualities, and its role in shaping the subjective experience, forms a field of internet art loosely know as 'data visualization'. The reshaping of information has been a motif for many decades in advanced art-making. Artists such as Hans Haacke, Lynda Benglis (b. 1941), Richard Serra (b. 1939) and Martha Rosler (b. 1943) offer rich legacies in this regard. While Haacke made work pointing to the interrelations of matter, social relations and technology, Serra and Benglis communicated the processional, flawed and transitory aspects of changes in form in works such as Serra's *Props* series of the late 1960s or Benglis's *For Carl Andre* of 1970. Rosler's work is particularly relevant in the ways it manifests the dubious nature of any given medium's 'truth value'. *The Bowery in Two Inadequate Descriptive Systems*, an important project by Rosler from 1974–75, used photos and text to point out and elide stereotypes of documenting the economically disenfranchised. The codes of documentary, text and image in that work are themselves subject to broader power imbalances. The areas of interest of these artists have countless online analogues, and one of the dominant concerns for many new media artists was how new technologies might commodify or neutralize various diversities of information.

In early 1997, artist and engineer Natalie Jeremijenko asserted the connection between technology and the body politic in a lecture called 'Database Politics' at the Museum of Modern Art in New York:

Technologies are tangible social relations. That said, technologies can therefore be used to make social relations tangible. Technologies create

107 **Amy Alexander**, *b0timati0n*, 2001. Net art seemed to move outside of the monitor after 2000, as evidenced by the 'show' put on by this artist using search engines. Results from the search engine's 'bot' (a computer program that runs automatically) are displayed in continuously animating patterns. Akin to a 'light and sound' interpretation of a quotidian online search, Alexander's work used humour and spectacle to bring net practices to life.

108 **Coco Fusco** and **Ricardo Dominguez**, *Dolores from 10 to 10*, 2001. This net performance was inspired by a real-life incident in which a Tijuana worker was locked in a room for twelve hours on suspicion that she was trying to unionize fellow-workers. Fusco and Dominguez webcast fictionalized surveillance tapes of her internment. The voyeuristic dimension of webcasting co-exists with an equally powerful critique of widespread apathy to the labour conditions in poor countries.

the material conditions within which we work, and imagine ourselves and our identities. I am concerned with how technology is developed within a context where overarching priority is given to formal systems over content, and where the complicating and politicizing projects of postmodernity are marginalized. I am interested in the epistemological work of current technologies. This includes what gets technological attention and what does not, what gets counted, and what gets left out. What is the political fabric of the information age? And what interventions can be made in a place where economics gets equated with politics, where diversity is rendered in homogeneous database fields, and where consumption forms identity?

Jeremijenko's observations that most of the applied organizational systems of the information age involve databases or structures contingent on broader political and social codes is often made evident in works of data visualization. Some of the best new media work in this vein calls attention to the non-neutrality and often arbitrary nature of information.

In the same way that an installation creates a particular context for reflection, the internet's limits construct relationships between users and the medium. Mongrel's *Natural Selection*, a search tool, storyboards these constructed relationships. The project evolved out of the group's observations that the net, with its unrestricted access and capacity for self-publishing, was a magnet for propaganda, in particular material promoting racial stereotypes and other offensive race-related texts and images. Mongrel members Graham Harwood and Matthew Fuller set out to smash this trend. In Matthew Fuller's words, the project offers a fresh

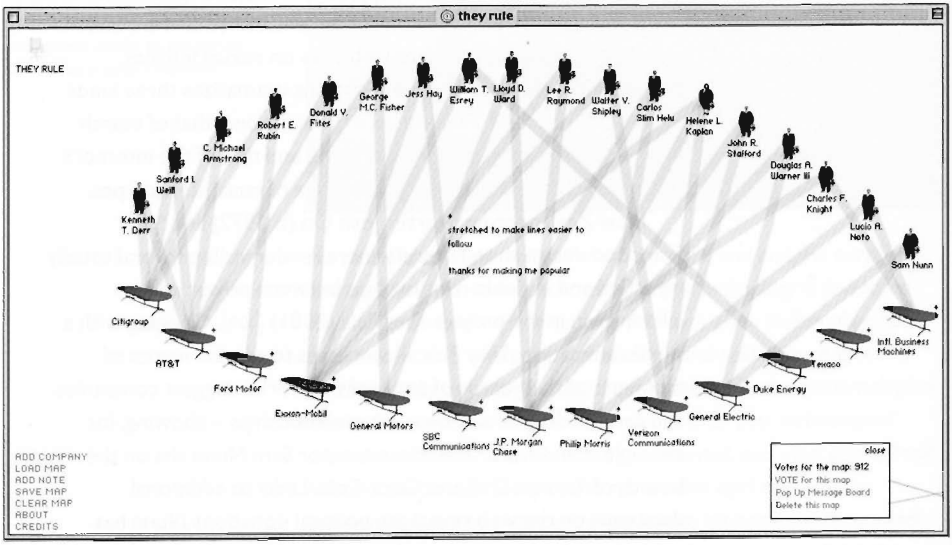
approach to tackling one of the net's most notorious scourges: 'Along with porn, one of the twin spectres of "evil" on the internet is access to neo-Nazi and racist material on the web. Successive governments have tried censorship and failed. This is another approach – ridicule.' If one uses *Natural Selection* to perform a web search, entering words without racial inflections like 'spaceship' or 'doughnut', one gets standard search engine results of web pages. If one enters a racially charged word like 'Nazi' the results appear standard, but if users click onto one of these pages, they will be confronted with very different and unexpected materials, such as web sites on sexual fetishes. Mongrel's mockery of racist publications dramatizes three kinds of web failures: that of the net as a utopian zone; that of search engines as consistent and neutral tools; and that of the internet's (often unwitting) hosting of the language of racial stereotypes.

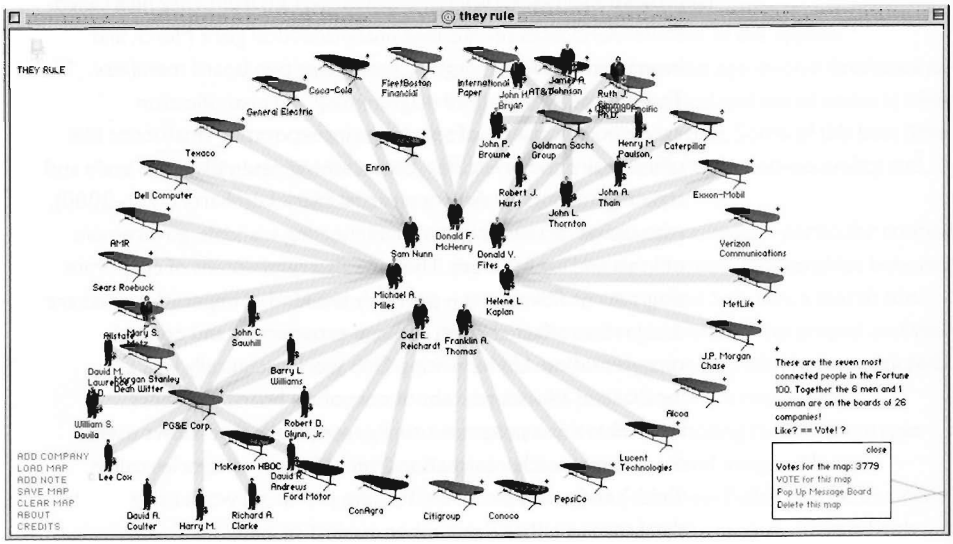
New Zealander-born artist Josh On (b. 1972) and San Francisco design shop Futurefarmers render visible several usually mystified and invisible relationships between power and information in the project *They Rule* (2001) [109]. Opening with a simple animation, *They Rule* allows users to see the names of members of the boards of some of the world's biggest companies, and creates diagrams of their interrelationships – showing, for example, that former American senator Sam Nunn sits on the boards of Texaco, Dell and Coca Cola. Links to additional databases on the web reveal the political donations Nunn has made over the past years, and maps reveal his web of social and professional relationships. Another diagram from *They Rule* called *Pharm & Finances* reveals that pharmaceutical giant Merck and investment bank JP Morgan Chase share two board members. The rigorous, specialized diagramming and quantification executed in a palette of soft greys, incorporating small icons like office chairs and briefcases, bear a strong resemblance in scale and style to drawings by American artist Mark Lombardi (1951–2000), who chartered suspicious ties connecting scandals, government officials and big business. They are also reminiscent of corporate diagrams or flowcharts – precisely the kind of imperatives that are designed to effect change, reshape experiences and control representation. Underwriting On's work technically was a database of information about corporate board members. A 'database' is a program, usually searchable, that allows users to mix and match information from different categories called 'fields', and a number of artists have produced work using databases as either a metaphor, subject or medium.

Lev Manovich has argued in *The Language of New Media* that the database is a dominant new media form:

The most obvious examples are popular multimedia encyclopedias, collections by definition, as well as other commercial CD-ROM (or DVD) that feature collections of recipes, quotations, photographs, and so on.... As defined by original HTML, a Web page is a sequential list of separate elements – text blocks, images, digital video clips, and links to other

109 **Josh On** and **Futurefarmers**. *They Rule*, 2001



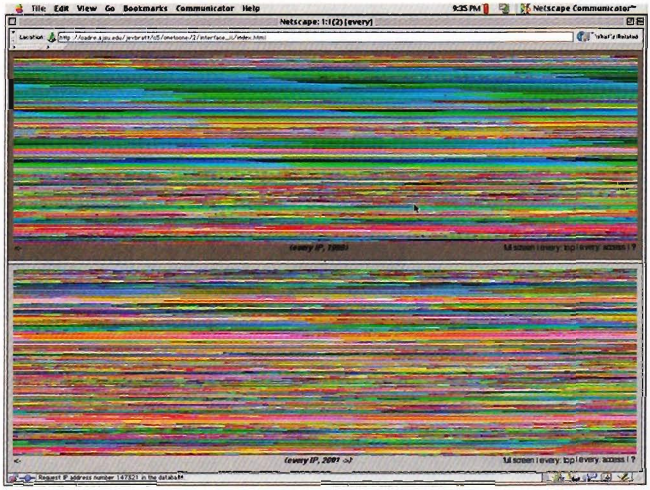


110 **De Geuzen (Riek Sijbring, Renee Turner, Femke Snelting)** in collaboration with **Michael Murtaugh**, *Unravelling Histories*, 2002. This beautifully designed database, revealing interlocking themes in Dutch colonial history, was inspired by the innovation of a Dutch art historian who, with fabric in short supply after World War II, used military maps to make her dresses. De Geuzen's installation of 1940s dresses and an online database is a feminist attempt at identifying and reclaiming female historical figures.

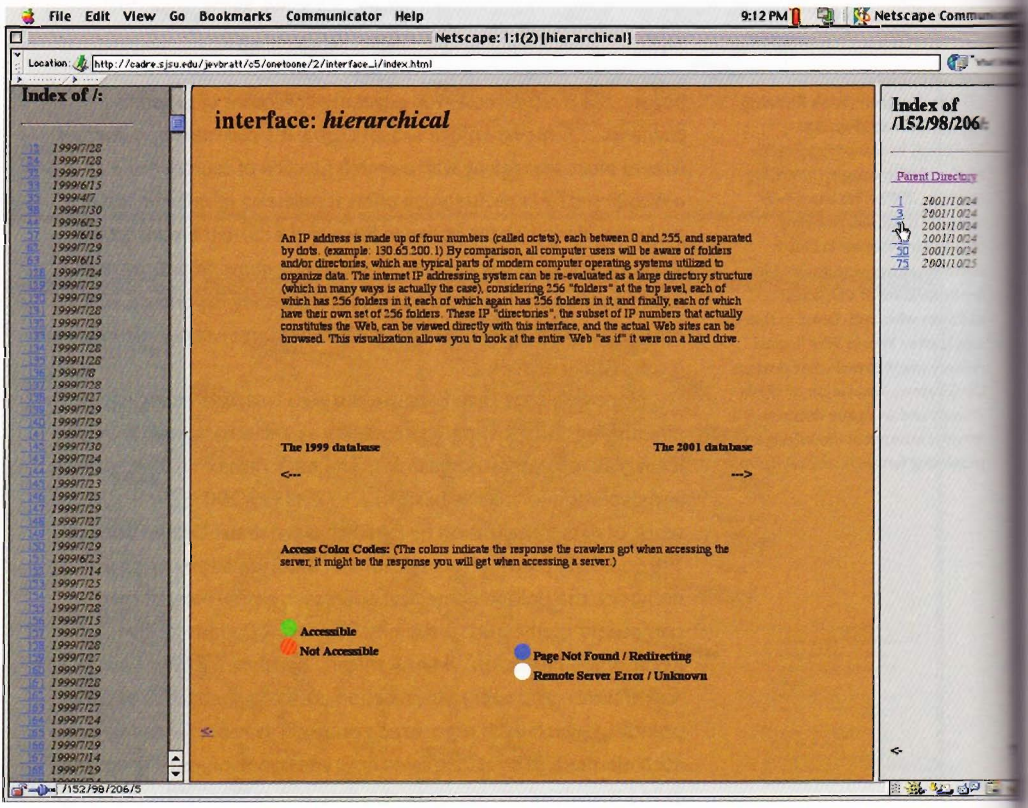
pages....As a result, most Web pages are collections of separate elements....A site of a major search engine is a collection of numerous links to other sites (along with a search function of course). A site of a Web-based TV or radio station offers a collection of video or audio programs along with the option to listen to the current broadcast, but this current program is just one choice among many other programs stored on the site. Thus the traditional broadcasting experience, which consists solely of a real-time transmission, becomes just one element in a collection of options.

Manovich adds that, because the web is always changing, diminishing and growing, its capability as a database far outweighs its narrative-orientated qualities. The net's rate of change, growth and depletion forms the basis of *1:1 (2)* (1999/2001) [111–113], a work of data visualization by Swedish-born artist Lisa Jevbratt (b. 1967). *1:1 (2)* pictorializes sections of the internet by using IP numbers, the unique numerical addresses given to registered computers connected to the net. The work comprises five iterations – 'Migration', 'Hierarchical', 'Random', 'Every' and 'Excursion' – and every visualization contains thousands of data points, in which each registered computer is represented by one such element. Jevbratt explains how she used software programs called 'crawlers' to aggregate the data and compose the interface:

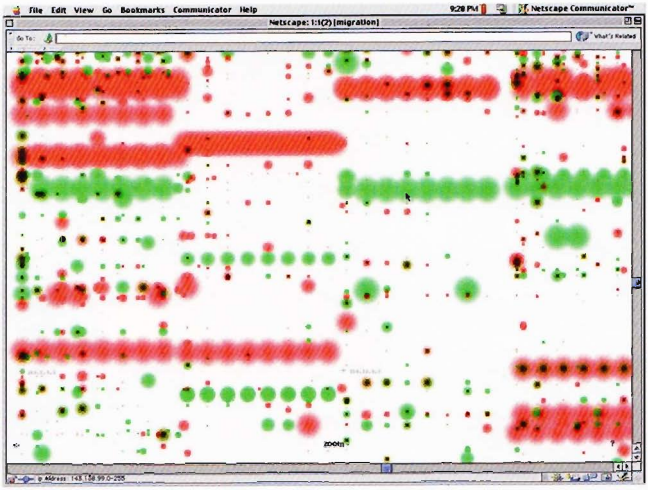
Right:
111 **Lisa Jevbratt**, *1:1 (2)* – Interface: 'Every', 1999/2001. There are two versions of this project – one dating from 1999 and another from 2001 – both of which can now be viewed simultaneously on split screens (as in this illustration). All web sites have an Internet Protocol (IP) address, consisting of several numbers, which together make up the web's numerical space. Using a database of IP addresses compiled by research group C5, member Jevbratt has created five visualizations of the web's entire numerical territory. The pictures work by using colour-coded pixels to represent IP addresses, which a user can then access by clicking.



Below:
112 **Lisa Jevbratt**, *1:1 (2)* – Interface: 'Hierarchical', 1999/2001

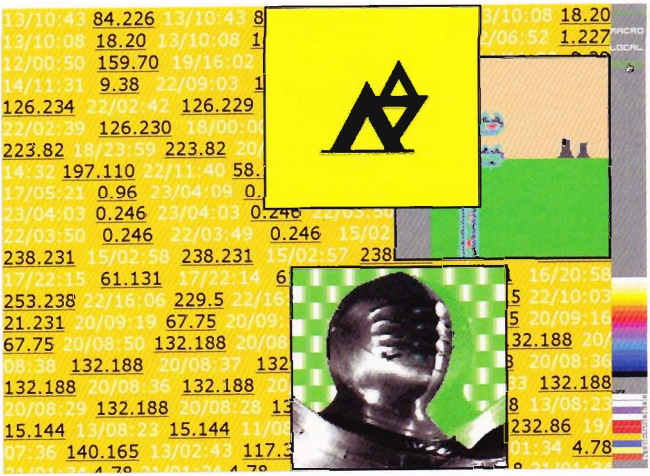


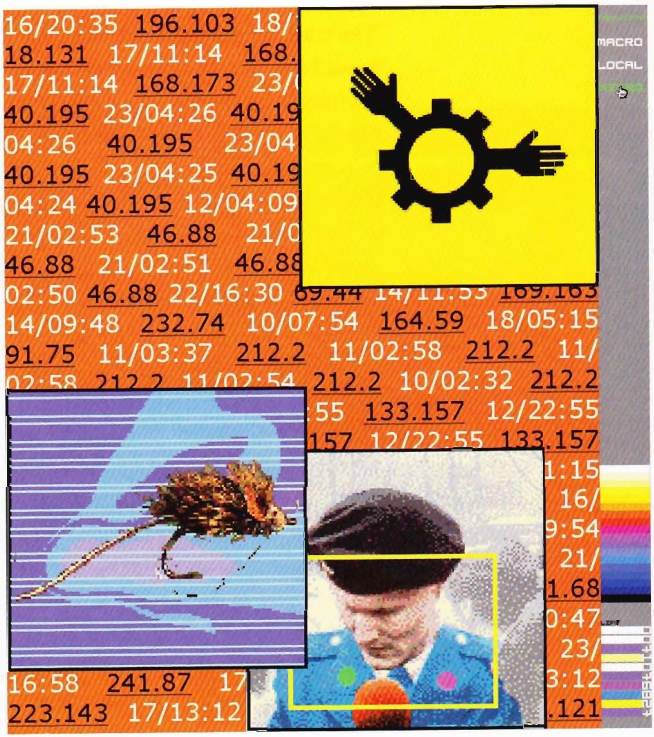
113 **Lisa Jevbratt**, *1:1 (2)* – Interface: 'Migration', 1999/2001



'The crawlers don't start on the first address going to the end; instead they search selected samples of all the numbers, slowly zooming in on the numerical spectrum. Because of the interlaced nature of the search, the database could in itself at any given point be considered a snapshot or portrait of the web, revealing not a slice but an image of the web, with increasing resolution.' There is an impossible quality to this affecting work, akin to the futility with which John Simon's *Every Icon* inches towards the wholeness of manifesting every imaginable icon only to be constantly marked by incompletion. In the case of Jevbratt's work, the interface to the internet becomes the internet itself. The ratio indicated by the title, a pixel for each web address, results in a highly dense field, yielding somewhat insoluble results. The scale of the web and the pixel are balanced in an uncomfortable tension. In the 'Every' iteration of *1:1 (2)*, a landscape emerges and the work tends towards the imagistic and representational. According to Jevbratt: 'The variations in the complexity of the striation patterns are indicative of the numerical distribution of web sites over the available spectrum. Larger gaps in the numerical space indicate an uneven and varied topography, while smoother color transitions and more consistent layers are indicative of "alluvial", or sedimentary, flat-lands in the web's IP space.'

In the work *Anemone* (1999) [115], artist Benjamin Fry (b. 1975) uses organic visual metaphors to represent web traffic on a given hub, creating an analogy between natural systems and online information sets. A similar work by Fry is *Valence* (1999) [116], which takes information-rich objects, such as books or web sites,

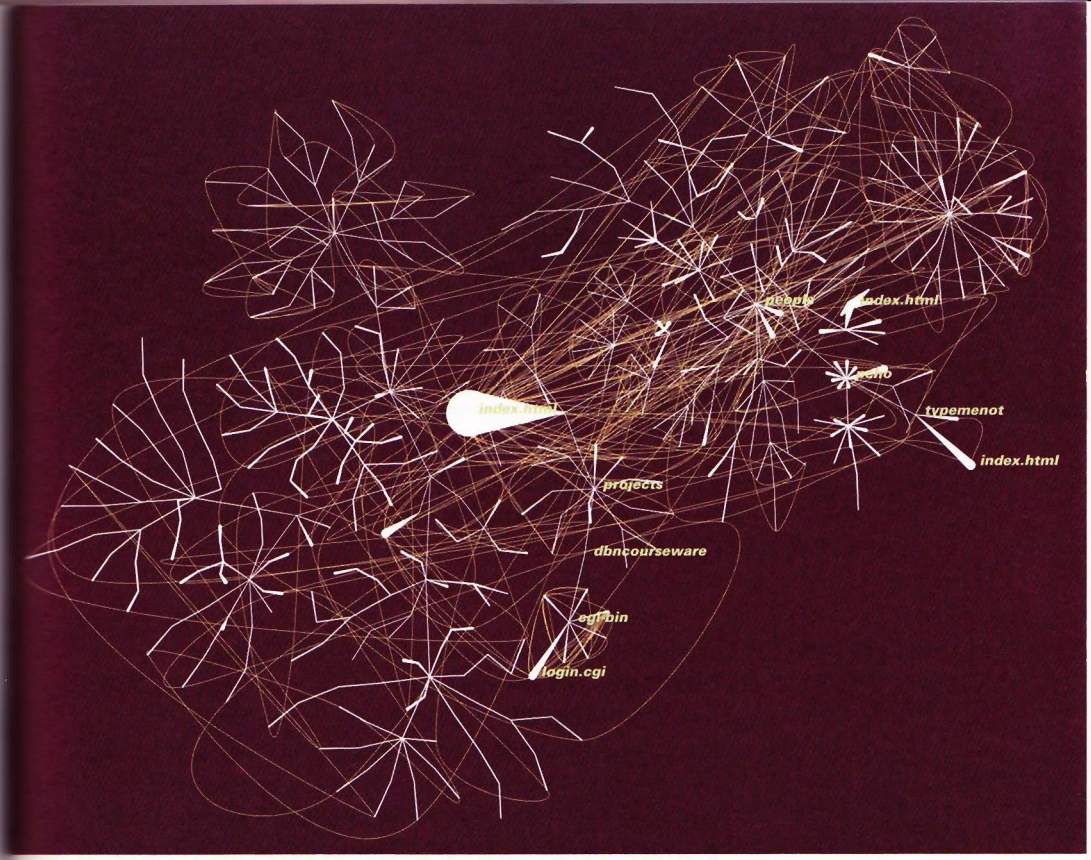




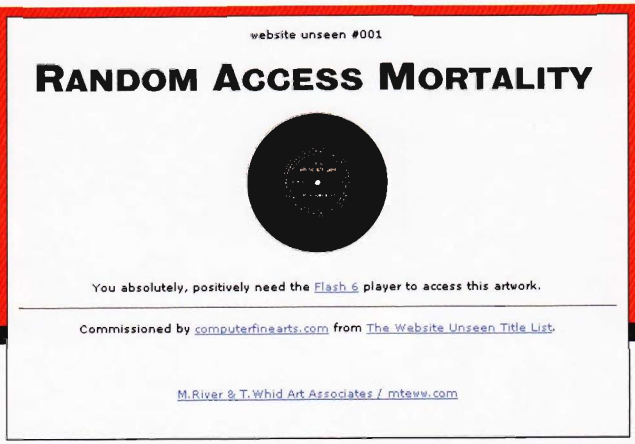
114 **Erik Adigard/m.a.d.** (with **Dave Thau**), *Timelocator*, 2001. Though ostensibly a clock interface, *Timelocator* contains a great deal of information and links. The somewhat basic premise belies the sophistication of the programming, an economy not uncommon to this period of net art.

Opposite above:
115 **Benjamin Fry**, *Anemone*, 1999. *Anemone* both visualizes a web site's complicated and changeable structure and maps its usage patterns. The project investigates a site's structure by using a tree-like diagram to represent its individual pages, which are displayed as nodes at the tip of each branch (clicking on a node reveals which web page it represents). The more frequently an individual page is visited, the thicker its respective node becomes (up to a certain threshold), while pages that draw in no visitors eventually lose their branch.

Opposite below:
116 **Benjamin Fry**, *Valence*, 1999


people
index.html
info
typemenot
index.html
projects
dbncourseware
cgi-bin
login.cgi


instead
journal
small
proprietors
that
therefore
ought
francisco
traveled
east
kind
profundity
usual
interest
books
he
rig
re
emiwide
emotov
whether



117 **MTAA (Mark River** and **Tim Whidden)**, *website unseen #001: Random Access Mortality*, 2002

and visualizes individual pieces of information, based on how they interact with each other. The data-visualization software reads a text and connects each word by lines in a three-dimensional format. The more often a word appears, the further away it is placed from the diagram's centre. In this way, *Valence* is able to provide a general overview of the structure of information in any given text, highlighting, as Christiane Paul points out, 'relationships between data elements that might not be immediately obvious, and that exist beneath the surface of what we usually perceive'.

Other database-driven compositions are based on chance. In a work indebted to John Cage's scores of random sounds, *Random Access Mortality* (2002) [117] by American duo Mark River and Tim Whidden (who work under the name MTAA), songs by the band The White Stripes are divided into samples equal to one revolution of a 45 RPM record. These 1.33-second clips can be listened to individually, or every sample from the song can be heard in a random sequence, so that what was once a fairly harmonious and cogent narrative is synthesized to become something that seems full of more diverse and unrelated contents. The reverberations between the musical scraps and the original song suggest a stifling of a media form (music) by database means.

Games

Though few other projects shared the high economic stakes of 1999's *Toywar* campaign, gaming has developed into a lively and varied field of artistic practice. Besides their potential for fun,

games had attractive, colourful surfaces, offered role-playing opportunities and dramatic narrative possibilities, and also boasted show-stopping architectural spaces, the cutting edge of three-dimensional digital design. Game environments in fact crystallize some of internet art's most distinctive characteristics, chief among them interactivity: a game literally depends on a player. Creativity is also vital, as the hacks and additions players make and share within their communities comprise a significant part of game culture. In these open games, participants' own innovation is encouraged, and users are expected to come to their own conclusions about a game's successes and failures. These ideas exist within both the open-software movement and new media art communities that encourage feedback and popular, critical discourse. Finally, game art explains a mode of spatially based narrative that inflects many online experiences. As Lev Manovich writes in *The Language of New Media*, 'In most games, narrative and time are equated with movement through 3-D space, progression through rooms, levels or words. In contrast to modern literature, theater and cinema, which are built around psychological tensions between characters and movement in psychological space, these computer games return us to ancient forms of narrative in which the plot is driven by the spatial movement of the main hero, traveling through distant lands to save the princess, to find the treasure, to defeat the dragon, and so on.' Internet artists often deployed these forms and internal strategies of games to disseminate images or ideas.

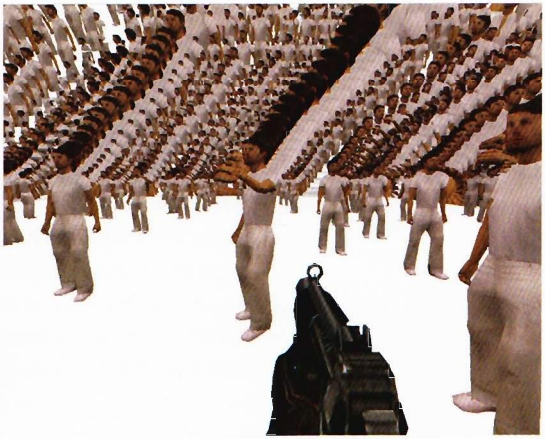
In Natalie Bookchin's *The Intruder* (1999) [118], a story by Argentinian writer Jorge Luis Borges is propelled by the playing of various seminal game models, from Pong to war simulations. The user listening to the audio file that narrates the short story

118 **Natalie Bookchin**, *The Intruder*, 1999

must be an active participant, catching, shooting and so on, in order to hear the next instalment of the story of two brothers who love the same woman. Part game history, part experiment in applying physical relationships to words, *The Intruder* enriches the communication and literary palettes of games.

Commercial games, such as those for Sony Playstation or Microsoft X-Box, rely on teams of programmers, designers and producers, and require significant investment to be developed. Artists and gamers began to explore and domesticate their often astonishing formal backdrops and internal contents in a field of activity called modification, or 'mods'. Visible forms of intervention include the patch, in which one can change the appearance of a game's character and its texture maps (or backgrounds). These and other mods sometimes acted as forms of critique, material methods for diversifying a game's politics or its visual aspects. American artist, curator, writer and gamer Anne-Marie Schleiner (b. 1970) described these possibilities in an interview in 1999: 'I am interested in the notion of art as culture hacking, art with a critical agenda that seeps outside the boundaries of prescribed art audiences and engages itself with a broader public (i.e. the gaming public). Art that finds cracks in the code and hacks into foreign systems. I also want to invite a cross-pollination of gaming and art strategies by providing artists with tools and techniques developed by game hackers and exhibiting game patches created by gamers as art.'

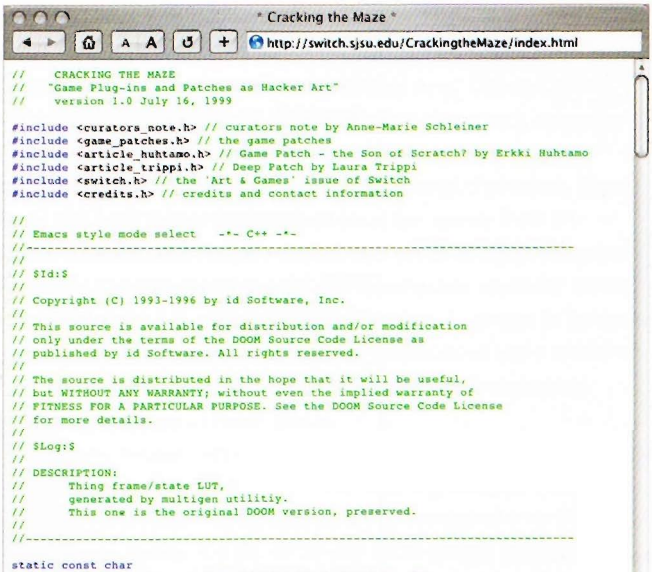
119 **Paul Johnson**, *Green v2.0*, 2002. This piece, which includes artist-created games and artfully presented hardware, is not internet art per se, but nonetheless exemplifies the growing acceptance of technoart and gaming in the art world.



Above left:
120 **Brody Condon**, *love_2.wad* (*Velvet-Strike* spray), 2002. *Velvet-Strike* is a collective effort by Anne-Marie Schleiner, Joan Leandre and Brody Condon to deposit politically progressive content in military-fantasy game Counter-Strike. Created as a response to Bush's 'War on Terror', it allows users to spray anti-war graffiti onto walls in the game environment.

Above right:
121 **Brody Condon**, *Adam Killer*, 2000–2. *Adam Killer* comprises a number of modifications of the shooter game Half-Life. In this picture, multiple copies of a character create a disorientating and bloody environment when they are attacked with weapons.

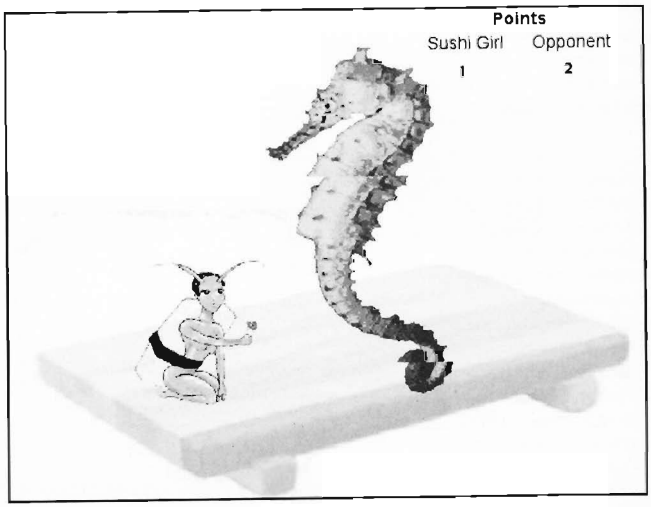
Right:
122 Documentation of the online exhibition 'Cracking the Maze', 1999. The text-heavy interface for this important exhibition of game patches deliberately resembles the source code of Doom. A popular, open, commercial game, Doom allows players to modify and customize its aesthetics. Makers of open games like Doom pay attention to mods and patches, sometimes adjusting later versions of their products to align with what players want.




```
//    CRACKING THE MAZE
//   "Game Plug-ins and Patches as Hacker Art"
//    version 1.0 July 16, 1999

#include <curators_note.h> // curators note by Anne-Marie Schleiner
#include <game_patches.h> // the game patches
#include <article_huhtamo.h> // Game Patch - the Son of Scratch? by Erkki Huhtamo
#include <article_trippi.h> // Deep Patch by Laura Trippi
#include <switch.h> // the 'Art & Games' issue of Switch
#include <credits.h> // credits and contact information

//
// Emacs style mode select   -*- C++ -*-
//-----------------------------------------------------------------------------
//
// $Id:$
//
// Copyright (C) 1993-1996 by id Software, Inc.
//
// This source is available for distribution and/or modification
// only under the terms of the DOOM Source Code License as
// published by id Software. All rights reserved.
//
// The source is distributed in the hope that it will be useful,
// but WITHOUT ANY WARRANTY; without even the implied warranty of
// FITNESS FOR A PARTICULAR PURPOSE. See the DOOM Source Code License
// for more details.
//
// $Log:$
//
// DESCRIPTION:
//      Thing frame/state LUT,
//      generated by multigen utilitiy.
//      This one is the original DOOM version, preserved.
//
//-----------------------------------------------------------------------------

static const char
rcsid[] = "$Id: info.c,v 1.3 1997/01/26 07:45:00 bl Exp $";

// Data.
#include "sounds.h"
#include "m_fixed.h"

#ifdef __GNUG__
#pragma implementation "info.h"
#endif
#include "info.h"

#include "p_mobj.h"

char *sprnames[NUMSPRITES] = {
    "TROO","SHTG","PUNG","PISG","PISF","SHTF","SHT2","CHGG","CHGF","MISG",
    "MISF","SAWG","PLSG","PLSF","BFGG","BFGF","BLUD","PUFF","BAL1","BAL2",
    "PLSS","PLSE","MISL","BFS1","BFE1","BFE2","TFOG","IFOG","PLAY","POSS",
    "SPOS","VILE","FIRE","FATB","FBXP","SKEL","MANF","FATT","CPOS","SARG",
    "HEAD","BAL7","BOSS","BOS2","SKUL","SPID","BSPI","APLS","APBX","CYBR",
```

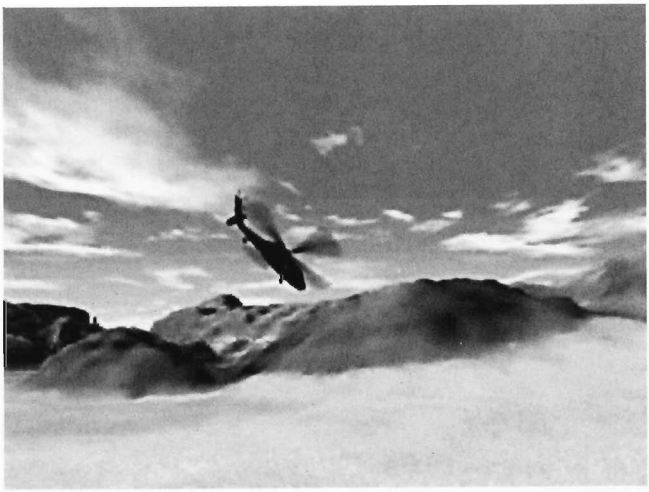
Indeed, on Schleiner's web site her own work and curatorial projects are creative engagements with typical gender ideologies and xenophobia of games. Her *Anime Noir-Playskins* (2002), developed with Melinda Klayman, embraces the hybrid forms and characters of Japanese *anime* and rewards players for flirtation and mutual sex-positive interactions, assailing the sexism or homogeneous narratives of standard gaming fare. In 'Cracking the Maze' [122], an exhibition organized by Schleiner, artist Sonya Roberts made Quake players into buff, tough 'frag' queens (a play on drag queens), who seem sufficiently physically endowed to prevail in any match. Also in the exhibition was Parangari Cutiri's *Epileptic Virus Patch* for Marathon Infinity, a shooter game; in the altered version, fluorescent pulsating pixels and strobe lights reflect a player weakened by overload and exhaustion. Because gaming culture has thriving subcultures in the exchange of patches, textures and other graphics, the works enter into wider populations and discourses, and do not remain ironic or stagnant displays. On a more recent exhibition exploring erotic games and digital art, 'Snow Blossom House', Schleiner notes: 'I included screenshots of gay and lesbian movies made with nude Sims Skins. Gaming has become a digital folk art medium. Within their online communities, gamers play the roles of critics, curators, and artists, distributing their own game mods and collecting and reviewing others.'

Los Angeles-based artist Eddo Stern (b. 1972) endowed game narratives with political realism in his digital video *Sheik Attack* (2000) [124], in which gaming's shared edges with desktop violence and combat coexist in a work based on documented events from



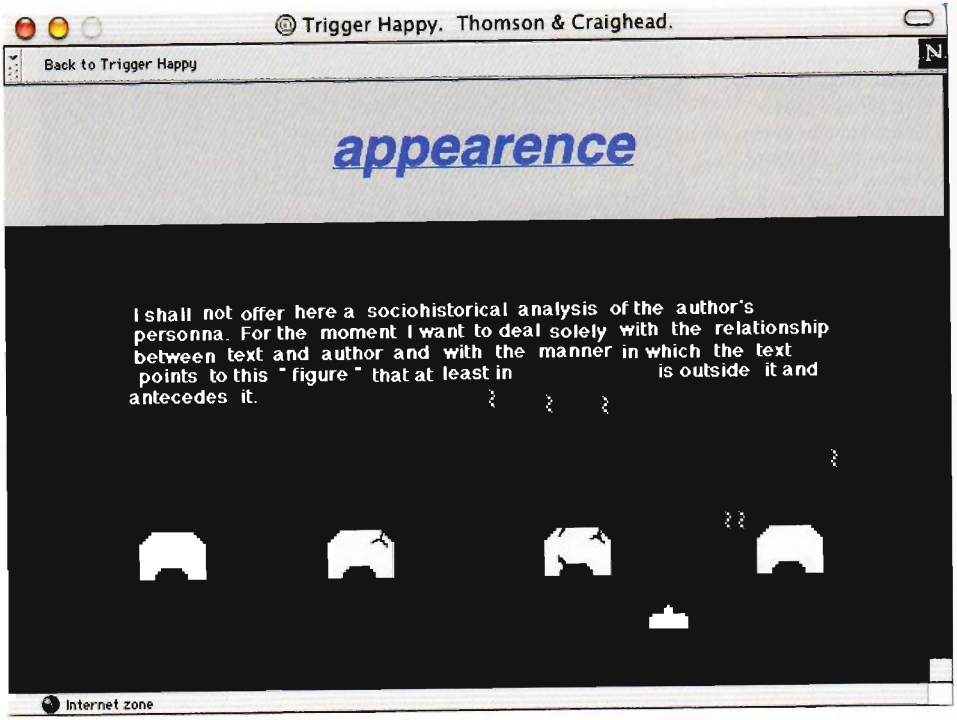
123 **Melinda Klayman**, *Sushi Fight*, 2001. Part of the exhibition 'Snow Blossom House', curated by Anne-Marie Schleiner, *Sushi Fight* charts a sushi girl's increasingly difficult battle against various sea creatures with a magic flower as her only weapon. The player makes the girl grow if he or she attacks the opponent at the right time by clicking on the flower, but losing a point makes the sea creature increase in size.

124 **Eddo Stern**, *Sheik Attack*, 2000. Stern's digital videos are assembled from computer games such as Nuclear Strike, Delta Force and Settlers, and are significant in internet art history for their preoccupation with recreational, media-based and historical foundations of selfhood – concerns that intersect and reflect one another in contemporary technoart.



the Israeli–Palestinian conflict. Stern's *Summons to Surrender* (2000) is an experiment in narrative intervention. Using the online communities of three medieval-themed games, Sony's EverQuest, Microsoft's Asheron's Call and Electronic Arts' Ultima Online, Stern inserted computer-controlled game characters, using the game world as a live performance space, streaming the game actions online, and offering 'free' use of shared characters. Stern says this 'may appear like quixotic pleas for agency from an enthralled fan.... But these actions also serve to hijack the game's space and context and assert a newfound public space for street performance.' A cyberpunk-inspired project, *Summons to Surrender* introduces sci-fi allusions, alternative interactions and a model of resistance into the nostalgically medieval and homogeneous utopian backdrop of those games.

Enemy encounters take a more theoretical turn in *Trigger Happy* (1998) [125] by British duo Thomson & Craighead. Jon Thomson (b. 1969) and Alison Craighead (b. 1971) developed a version of the 1978 Space Invaders, a classic among video games, in which the invading enemy is not an alien force, but rather quotations from Michel Foucault's essay 'What is an Author?' from 1969. The game challenges the players' attention spans by forcing a dilemma between reading the quotes and preserving one's safety amid dropping bombs while shooting at them (it proves very hard to do both). Hypertext links deriving from the quotations at the top of the screen distract even further. British writer J. J. King wrote about this frenzied environment as a comment on the attention strategies required by contemporary technologies: '*Trigger Happy* is



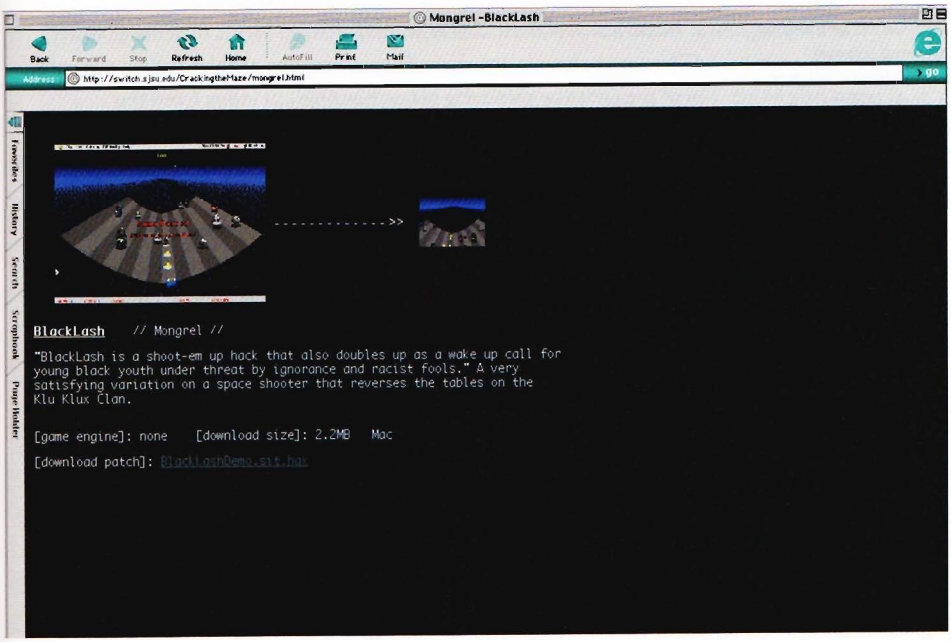
125 **Thomson & Craighead.** *Trigger Happy*, 1998

gesturing towards the basis of a future information economy, where attention, precisely because of its scarcity, may become a central commodity. The most successful constructions, we're left thinking, may be those which in generating attention and catching the gaze, can take the reader's finger off the trigger.' The player must destroy a quotation from Foucault's text about subject positions among writers, texts and readers, or face destruction by that text. Indeed, by configuring the game in this way, the artists establish an homologous relationship between the fictional opponents of gaming, and the tensile relationships of artist and viewer, or artist and player, to which Foucault's essay alludes. In *Trigger Happy*, resolution between these subject positions seems impossible: the most appealing possibility is to play another round.

Mongrel's *BlackLash* (1998) [126], which also appeared in the 'Cracking the Maze' exhibition, was a web-based game in which a player chose from four stereotyped black fighting characters, then slew his or her way to freedom by killing police and fascist characters. One of the creators, Richard Pierre-Davis, explained how the game deploys stereotypes: '*BlackLash* is based on a combination of stereotypical half truths and hardcore reality

coming from the point of view of a young black male trying to survive inner city life in the nineties, hence the name.... You choose one of the stereotyped characters, after which you proceed to battle the forces of evil that plot to convict or eliminate you from the streets. It also aims to encourage the black community through game culture that it is possible to break into different areas apart from music, and create games that have got some thing to say.' If many games rely on stereotypes and exemplary historical conflicts for their premise, as *BlackLash* did, Jodi.org's *SOD* (1999) radically modified the classic computer game Castle Wolfenstein, establishing abstracted spaces for gaming. With a jaunty score and limited palette of grey, black and white, the game space at first appears approachable. However, within the minimal environment it is difficult to ascertain the targets one is supposed to shoot, and easy to get lost in its disorientating, Kafka-esque space. Combining confusion, interactivity and a simple graphic environment, *SOD* hints at private emotions, all the while taking gaming back to its more primitive, computerized core. The ways in which artists have worked with games – creating new material for free widescale distribution into communities with feedback channels, and inflecting existing games with more personal and political and less homogenized content – have helped to produce a new dimension to an existing entertainment sector.

126 **Mongrel**, *BlackLash*, 1998



127 **Victor Liu**, *Children of the Bureaucrats of the Revolution*, 2002. Quake, an open-source game that encourages participation and creative use, offers the setting and 3D environment for this dance piece. Liu gives an insider's perspective of the dances by recording the viewpoints of the dancers themselves, simultaneously displaying them on adjacent monitors. Games have become regularly used software repositories from which artists create works of dance, performance, sculpture, music and video.

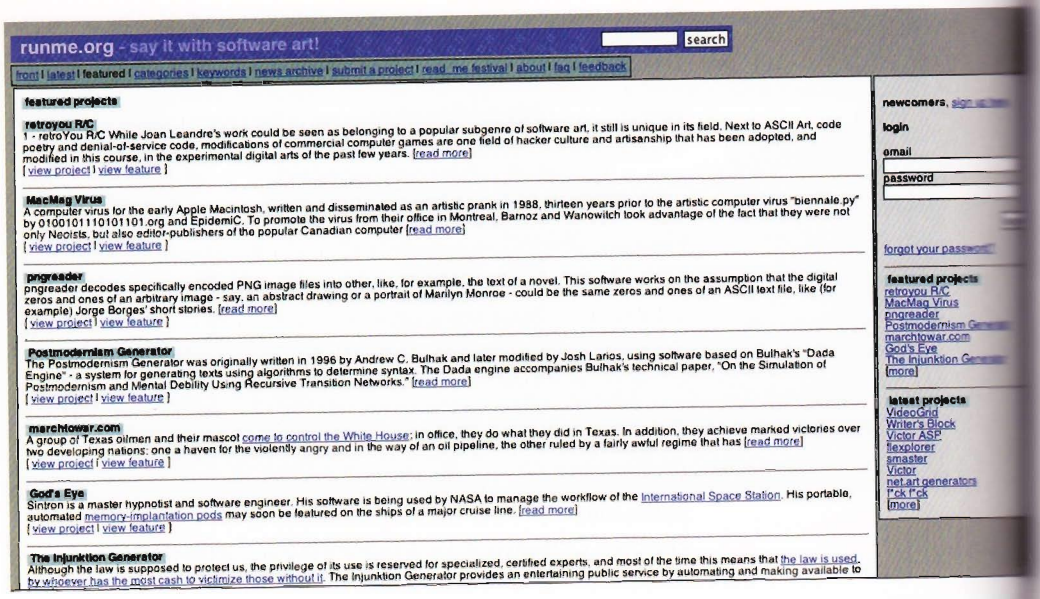
Generative and Software Art

Generative art, according to American artist and teacher Philip Galanter, is 'art practice where the artist creates a process, such as a set of natural language rules, a computer program, a machine, or other procedural invention, which is then set into motion with some degree of autonomy contributing to or resulting in a completed work of art'. Fluxus projects and Happenings, which relied on scores or instructions, have been recognized as historical precursors to new media-based forms of generative art. As with software art, many Fluxus projects problematized the role of the artist by removing his or her physical index from the production of the artwork. Art generated by software can lack the physical, improvisational latitude of a Happening, but can vary according to external data conditions or user input. In addition, if a project of software art is open (that is, its code is available or open to editing), it can be modified, adjusted and refined by another user. Some online software art is premised on the endurance of mechanized algorithms, such as John Simon Jr's *Every Icon*. Others draw attention to certain mechanized or routine behaviour among users, programmers or designers, or rely on varied input from users.

British writer Saul Albert described the term 'software art' as applicable to 'art that is made from, uses, or interrogates software as a cultural form and context'. One important influence encouraging the development of software and generative art is the free-software movement. Often identified with the rubric 'open source', free software and its communities organize around

libraries of code or particular projects. In these collaborations, the revisions and modifications by varied programmers are incorporated. With the success of Linux as a popular open-source operating system (an operating system is the central application of a computer, on which all other programs run), the economic and authorship paradigms of the free-software movement encouraged innovation, diversity and collaboration. The awarding of the prestigious Golden Nica Award to Linux at Ars Electronica in 1999 testifies to its importance as a model matrix for creative collaboration. Proprietary software, in comparison – for example, Adobe Photoshop and Microsoft Word, Excel and PowerPoint – is closed to modification and expensive to purchase. As German critic Dieter Daniels explains, open-source software is a 'bottom-up' system, while proprietary ware is 'a "top-down" structure as represented by the precise notation of a classical composition as well as the proprietary software developed by Bill Gates's Microsoft Corporation, for which the secrecy of the source code is the basis of a capitalist monopoly'. Beyond the ideology and cost of buying commercial software lie concerns, raised early on in *The Web Stalker*, that with its limited sets of commands and functions designed for use across a wide scale, commercial software inhibits experimentation and autonomy. Matthew Fuller, who has published extensively on how 'software forges modalities of experience', a topic sometimes known as 'software culture', writes of the need for collective activity among software engineers, artists and computer users. These teams, suggests Fuller, besides nurturing a diversity of tools, could also draw inspiration from the successful organizational structures of the free-software community, such as their repositories for distribution and collaboration.

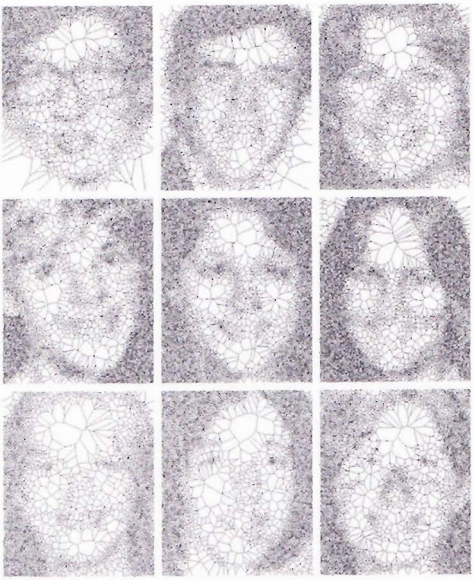
Runme.org [128], which Fuller helped organize, is such a work, inspired as it was by the distribution databases common among free-software initiatives. Developed by a team of artists, programmers and writers – Amy Alexander, Florian Cramer, Matthew Fuller, Olga Goriunova, Thomax Kaulmann, Alex McLean, Pit Schultz, Alexei Shulgin and The Yes Men – the web-based repository for software art foregrounds several interlocking paradigms of the open-software nodes: downloads, feedback and keyword indexing. In contrast to a traditional exhibition or gallery, *Runme.org* shares art within an artist-driven discursive context. While the projects included are diverse, enabling various forms of sound, image and textual creation, together they suggest a growing dominance of functionality, shareware and programming

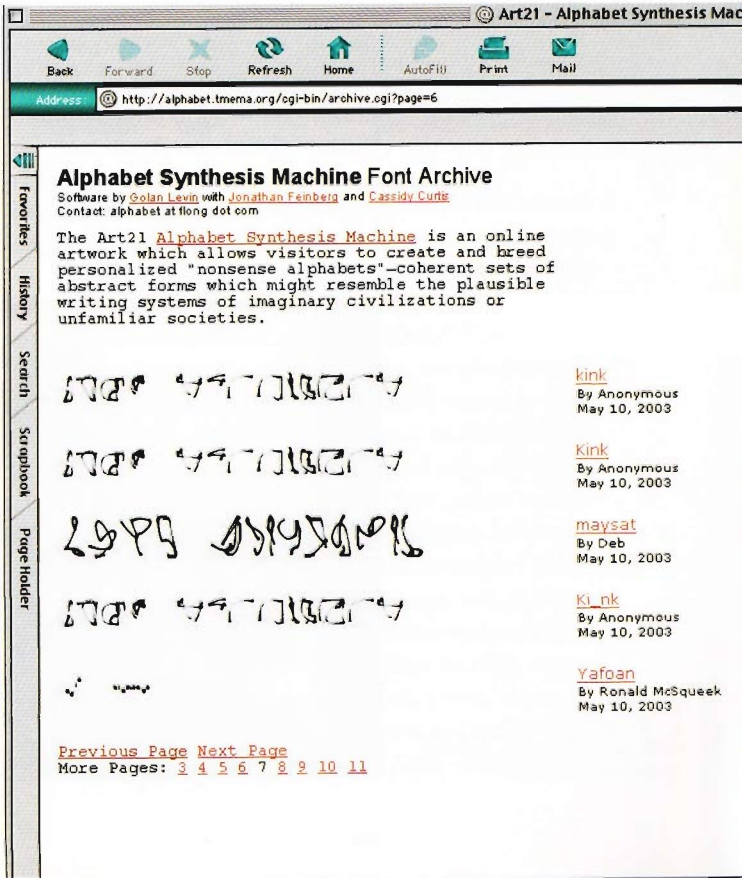


128 *Runme.org* software art repository, 2003

as an art genre. With the model of web-based discussion and distribution, *Runme.org* offers an alternative to other art discourse and archival models, such as Rhizome.org or THE THING. Like many works in this field, software art's proximity to free-software methods creates an important foundation.

Alphabet Synthesis Machine (2002) [130], made for American television network PBS by Golan Levin (b. 1972) with Jonathan Feinberg and Cassidy Curtis, allows users to consider certain dimensions of typography and handwriting by developing a typeface based on a direct mark (made with the mouse). Levin, despite his prowess as a programmer, understands that aesthetic activities online need not be devoid of handmade, direct, unmediated line creation and experimentation. The manual gesture of creating a letter, while subject to the rules of code that turn it into an alphabet, suggests a different set of possibilities, unlimited by proprietary word processor typefaces. Working in film and TV as well as software, American artist Barbara Lattanzi (b. 1950) began to develop software that would help her improvise with film and video, citing existing resources as inadequate: 'I would rather make my own software (what I term "idiomorphic software"), because the commercial software that I use comes at a price. That price has less to do with money and more to do with a different process of abstraction: the active framing of my work within considerations dictated by irrelevant practices of Design.'





Above:
129 **Golan Levin**, *Yearbook Pictures*, 2000. A virtuoso programmer, Levin's intricate portraits are composed by software that converts images into delicate line formations. This series of photographs of teenagers is uniformly treated with the same application, yet each image is endowed with a particular, subjective gravity.

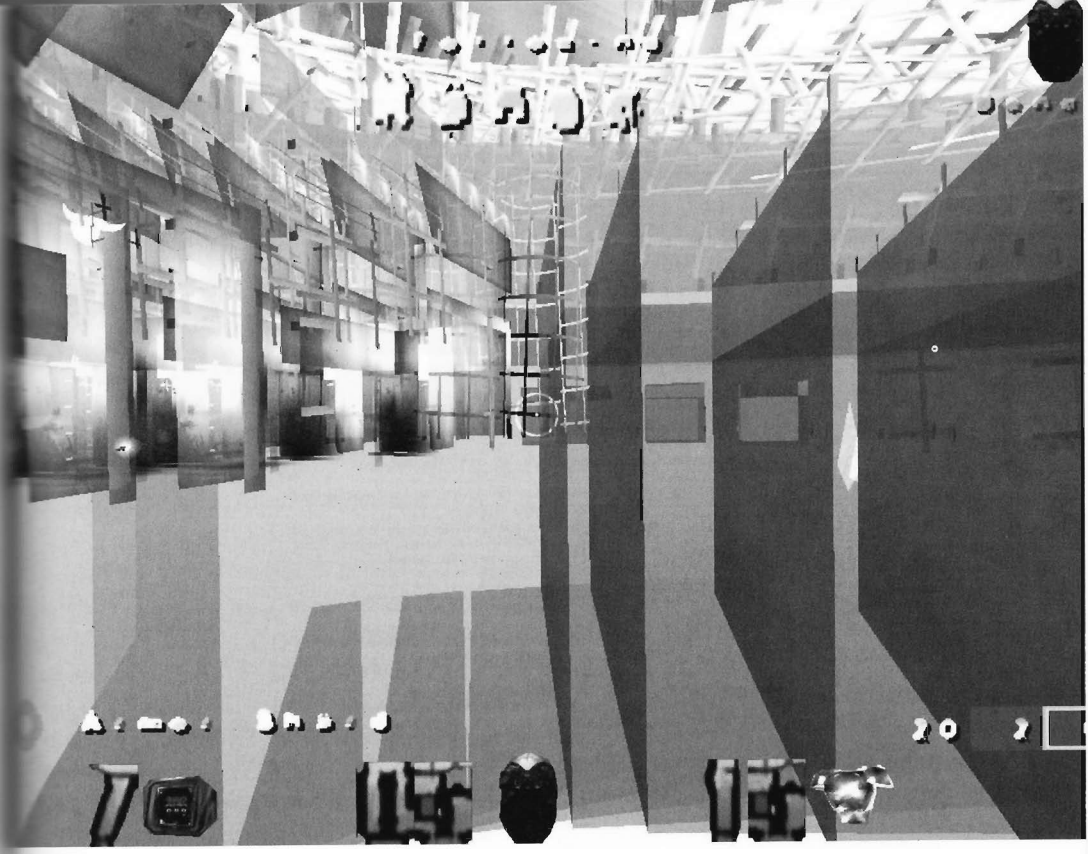
Below:
130 **Golan Levin, Jonathan Feinberg** and **Cassidy Curtis**, *Alphabet Synthesis Machine*, 2002

Lattanzi's software *HF Critical Mass* [131], one of almost ten pieces of freeware on her site, is based on the cinematic techniques of Hollis Frampton (1936–84) in his 1971 film *Critical Mass* and noteworthy for its particularity. Available for use at no charge by anyone who might want to adopt his or her QuickTime files using the film's idiomatic style, the work undoes the gestalt relationship between software and mass functionality that characterizes most applications. As Matthew Fuller notes, 'Software is reduced too often into being simply a tool for the achievement of pre-existing neutrally formulated tasks.'

Tom Betts (b. 1973) of the British group Nullpointer has developed software for composing music, as well as *QQQ* (2002) [132], a networked installation-cum-performance based on the online game Quake. The actions of the geographically dispersed players are perverted in such a way that they appear in the installation as colourful painterly gestures amidst abstracted architectural spaces. Whereas the actual Quake players are involved in murderous exploits, *QQQ* presents the game as a performance space for image production. The beautiful and invented mutations of Quake position the work on an artistic borderline between gestural painting and gaming.

In the 2002 exhibition 'CODeDOC' for the Whitney Artport, a site that promotes and commissions internet art at the Whitney Museum of American Art, curator Christiane Paul sought to represent how different processes of coding conditioned the experience and expression of one idea. Commissioning twelve artists to submit code that 'should move and connect three points

131 **Barbara Lattanzi**, *HF Critical Mass* software applied to *The Zapruder Film*, 2002



132 **Tom Betts**, *QQQ*, 2002

in space', Paul stipulated that the code should be the 'object', as opposed to 'what it produces'. By thus reverse-engineering the usual focus in software circles on functional works, this group exhibition encouraged users to examine source code itself before experiencing its expression; on the 'CODeDOC' web site, the former was a prologue to the latter. In her introduction to the project, Paul linked code with aesthetics and themes evident in art of the 1960s: 'Even if the physical and visual manifestations of digital art distract from the layer of data and code, any "digital image" has ultimately been produced by instructions and the software that was used to create or manipulate it. It is precisely this layer of "code" and instructions that constitutes a conceptual level which connects to previous artistic work such as Dada's experiments with formal variations and the conceptual pieces by Marcel Duchamp, John Cage and Sol LeWitt (b. 1928) that are based on the execution of instructions.' As a form, source code is revealed as a highly malleable instrument, and artists' interpretations are varied permutations using different languages

```perl
#!/usr/bin/perl

# title: global city ( for saskia sassen ), 2002
# author: sawad brooks
# created: august 15, 2002
# program creates on your computer an HTML file named "global.html"
# - a "globalcity" newspaper front page, viewable using a Web browser

use Socket;

@space = ( "www.nytimes.com" ,"www.guardian.co.uk" ,"www.asahi.com" );

open ( FILE, ">global.html" ) || die ( "Cannot Open File" );
select ( FILE ); $| = 1; select ( STDOUT );

srand;
$cityindex = int ( rand 3 );

print FILE "<div style=\"position: absolute; left: 0px; top: 0px\">" ;
print "connecting $space [ $cityindex ] ..." ;
# call function GetHTTP to fetch URL
@stream = &GetHTTP ( $space [ $cityindex ], "/" );
foreach $s ( @stream ) { print FILE $s ; print "." ; }
print FILE "</div>" ;

$cityindex ++; if ( $cityindex > 2 ) { $cityindex = 0; }

print FILE "<div style=\"position: absolute; left: 200px; top: 0px\">" ;
print "connecting $space [ $cityindex ] ..." ;
# call function GetHTTP to fetch URL
@stream = &GetHTTP ( $space [ $cityindex ], "/" );
foreach $s ( @stream ) { print FILE $s ; print "." ; }
print FILE "</div>" ;

$cityindex ++; if ( $cityindex > 2 ) { $cityindex = 0; }

print FILE "<div style=\"position: absolute; left: 400px; top: 0px\">" ;
print "connecting $space [ $cityindex ] ..." ;
# call function GetHTTP to fetch URL
@stream = &GetHTTP ( $space [ $cityindex ], "/" );
foreach $s ( @stream ) { print FILE $s ; print "." ; }
print FILE "</div>" ;

# Done
exit ;

# Note: You can copy or download the script above and run it locally on your computer.
# What you need:
# Perl for Macintosh OS 9 or older
# http://www.macperl.com/
# http://www.perl.com/CPAN/ports/mac/MacPerl-5.6.1r1_full.bin
# Perl for Windows
# http://www.activestate.com/
# http://www.activestate.com/Products/Download/Register.plex?id=ASPNPerl&a=e
# Linux | MacOSX | Unix systems have Perl already installed
```

Programmer-defined variables
String constants
Non-executing comments
Perl keywords

133 **Sawad Brooks**, the code for *Global City, for Saskia Sassen*, 2002 (from the 'CODeDOC' exhibition at the Whitney Museum of American Art). Using programming language Perl, Brooks displays pages of the online versions of three newspapers. Highlighting Brooks's interest in digital technologies – and the social, political and philosophical issues they raise – this project questions the relative autonomy of each newspaper and the way in which such publications are displayed.

```perl
# Function fetches a URLs

sub GetHTTP {
        local ( $hostname , $doc ) = @_;
        local ( $port , $iaddr , $paddr , $proto , $line , @output );

        # ignore the "host:port" notation, and assume http = 80 everytime.
        socket ( SOCK, PF_INET, SOCK_STREAM, getprotobyname ( 'tcp' )) || die "socket (): $!\n" ;
        $paddr = sockaddr_in ( 80 , inet_aton ( $hostname ));
        connect ( SOCK, $paddr ) || die "connect(): $!\n" ;
        select ( SOCK ); $| = 1; select ( STDOUT );

        # send the HTTP-Request
        print SOCK "GET $doc HTTP/1.0\n\n" ;

        # now read the entire response:
        do { $line = <SOCK> } until ( $line =~ /^\r\n/);
        @output = <SOCK>;
        close ( SOCK );
        return @output;
}
```

134 **Sawad Brooks,**
Global City, for Saskia Sassen, 2002
(from the 'CODeDOC' exhibition
at the Whitney Museum of
American Art)

```
WHAT:

    This program moves and connects 3 dots.

    Each of the 3 dots animates around it's own rectangle.

    The 3 dots are connected in their current location by a translucent white triangle.

    My program keeps track of former dot locations, and draws blue triangles connecting
    the 3 dots in places they used to be.

    Like most (all?) things, the traces of where the dots have been fade over time.

    You can change the rectangles,

            and therefore the trajectories of the dots,

                    and therefore the patterns created over time,

    by clicking anywhere on the screen.

    A random corner of one of the 3 rectangles will relocate to the spot you clicked.

    The dot controlled by that rectangle will move back onto it's trajectory around the
    new triangle (most of the time - sometimes it doesn't quite get back 'on track' but
    that was a mistake I liked so I left it.)

    To quit the program, hit ENTER on your keyboard.

WHY:

    This was apparently a very simple assignment: 'move and connect 3 dots'.

    But all motion implies time.

    Time and motion can create complexity out of very simple things.

    This is especially the case when a simple shape (a triangle) repeated over
    and over again, following another simple shape (a rectangle) creates a complicated
    network of lines.
```

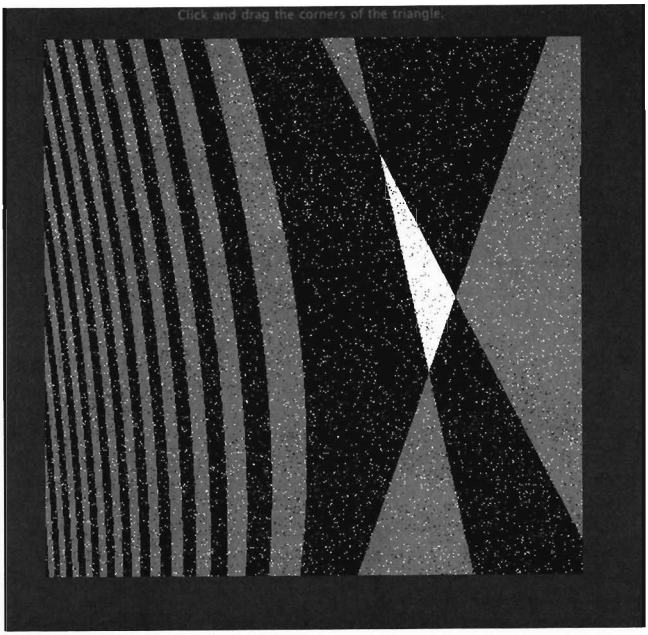
including C, Perl, Java or Lingo. While Sawad Brooks uses Perl in *Global City, for Saskia Sassen* [133–134] and Camille Utterback (b. 1970) works with C in *Linescape.cpp* [135], Golan Levin's *Axis* [137] and Martin Wattenberg's *Connection Study* [136] reveal code with Java. Far from dehumanizing texts, code shows its latitude for intention and personality: it is political in the hands of Levin, elegant and terse when written by Wattenberg, and hyperrational in Utterback's contribution.

Finally, not all software art exists in a functional state; some of it remains purely propositional. Moving away from the explorations of functionality and visualization in the previously discussed works, Graham Harwood's *London.pl* (2001) [138] exists in an even less objectified form than an application: it is simply a script in Perl (a language designed for processing text). *London.pl* consists of a program that calculates the collective lung capacity of children in London who have been, in the artist's words, 'beaten, enslaved, fucked, and exploited to death' since 1792 (at the time of

135 **Camille Utterback**, *Linescape.cpp*, 2002 (from the 'CODeDOC' exhibition at the Whitney Museum of American Art)

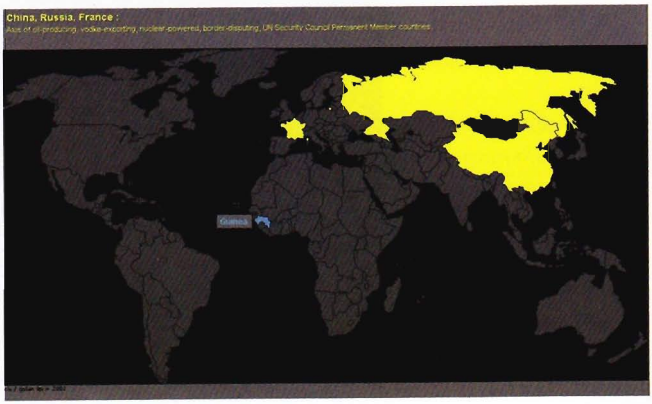
```
import java.awt.*;
import java.applet.*;

public class ConnectApplet extends Applet
        implements Runnable {
   Point current;
   Point[] p=new Point[3];
   Thread animation;
   int w,h;
   Image pictureImage;
   Graphics picture;

   public void init() {
      w=size().width; h=size().height;
      pictureImage=createImage(w,h);
      picture=pictureImage.getGraphics();
      p[0]=new Point(w/2,100);
      p[1]=new Point(w/2+70,170);
      p[2]=new Point(w/2-70,170);
      current=p[0];
   }
   public void start() {
      animation=new Thread(this);
      animation.start();
   }
```

```
// key: code in gray makes the program run.
//      code in black draws the picture.

public boolean mouseDown(Event e, int x, int y) {
   int shortest=Integer.MAX_VALUE;
   for (int i=0; i<p.length; i++) {
      int d2=(p[i].x-x)*(p[i].x-x)+
             (p[i].y-y)*(p[i].y-y);
       if (d2<=shortest) {
          current=p[i];
          shortest=d2;
       }
   }
   return mouseDrag(e,x,y);
}
public boolean mouseDrag(Event e, int x, int y) {
   current.x=x; current.y=y; return true;
}

synchronized void updatePicture() {
   for (int i=0; i<5000; i++) {
      int x=(int)(w*Math.random());
      int y=(int)(h*Math.random());
      long al=f(p[0],p[1],x,y),
```



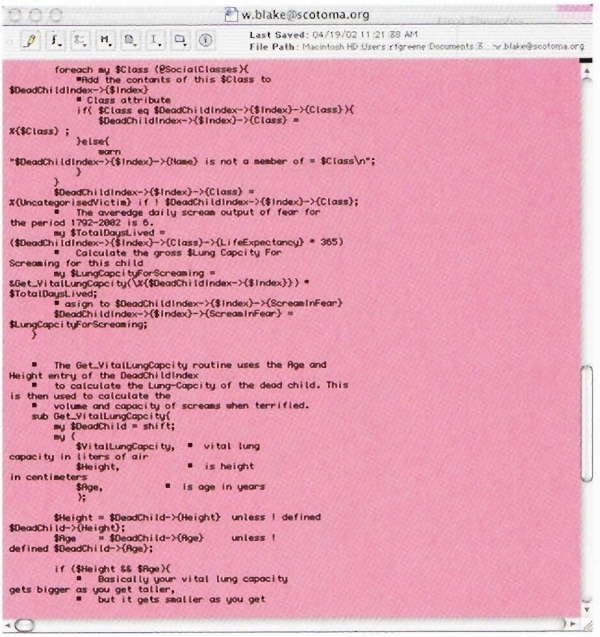
136 **Martin Wattenberg,** *Connection Study*, 2002 (from the 'CODeDOC' exhibition at the Whitney Museum of American Art)

```
the designations used in Axis do not imply the expression of any opinion
whatsoever on the part of the author or publisher concerning the legal
status of any country or territory of its authorities, or concerning the
delimitation of its frontiers or boundaries.

Although we have tried our best to document all possible Axes, our data
indicates that not all threesomes of countries have yet completed their
Axis registration form. Thus only approximately half of the 6 million
possible Axes are displayable at this time.
*/


import java.awt.*;
import java.applet.*;
import java.awt.image.*;

public class AxisApplet extends Applet implements Runnable {

    //-----------------
    // Declaration of variables.
    // See end of document for inlined database.
    Thread  appletThread = null;
    boolean stopThreadP  = false;
    int     csrX, csrY;
    int     iter = 0;
```



137 **Golan Levin**, *Axis*, 2002. Online Java applet (from the 'CODeDOC' exhibition at the Whitney Museum of American Art)

138 **Graham Harwood**, *London.pl*, 2001. Like Yoko Ono's instruction works, *London.pl* (written chiefly in the programming language Perl) may or may not be executed. Unlike most software art, this work introduces poetry and historical references into the algorithms of code.



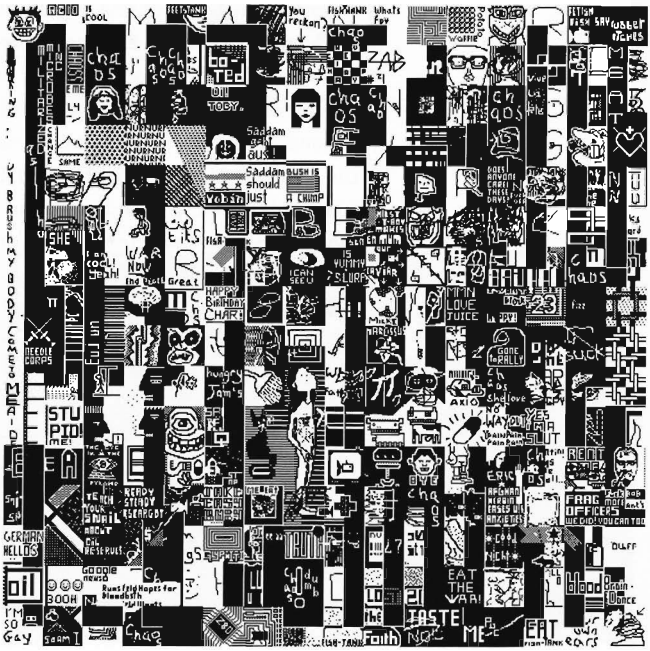
Britain's Industrial Revolution). The vital statistic is used to time a scream – the collective scream of these children – to be broadcast in London in the hope of redressing what the artist cites as an 'imbalance of imagination and innocence'. The consequences of the Industrial Revolution are also alluded to in quotations from William Blake's *Songs of Innocence and Experience*, which are remixed in the code along with the artist's premise and the Perl commands. In this work, code calculates the formal consequences of the artist's prescription for England. Engineering and functionality are designed but sidelined, and the work instead draws attention to its socially inspired internal content. It is the concept that gives the work its strength, not its materiality.

As Christiane Paul noted, there are parallels to be drawn between this form of generative art, software art and earlier art practices that changed the relationships between the artist and his or her work of art, like those by John Cage or Sol LeWitt. They, like other conceptual artists, opened up spaces between symbolic representation and enactment. Software projects such as *London.pl* are akin to works from the 1960s that emphasized proposition and intention via text-based projects. However, the circulation of *London.pl* and many other works of software art within free-software contexts as well as art zones gives them economic, technical and sociological values different from art

objects or events. Perhaps the most apt metaphor is that *London.pl*, and software art like it, can function like a musical property in the public domain, without copyright: it travels easily, and is free to sample and build upon.

Open Works

In their own ways, *London.pl* and 'CODeDOC' represent the model of open software in which users with programming knowledge can modify or participate as author, audience and critic. Building on the general knowledge of internet users, who are likely familiar with online communication and basic functions like uploading and downloading data, some artists sought to dissolve boundaries between art production and audience. Like Mark Napier's *Digital Landfill* [75], which explored the formal material of the web by having visitors chuck web sites in a metaphorical 'trash heap', or Nam June Paik's *Participation TV*, in which users could evolve complex visual structures, these works rely on essential contributions from their audience. Some are akin to the surrealist text-and-image collage technique, the 'exquisite corpse' so named after a fragment from one of the collaboratively formed sentences. In *Glyphiti* (2001) [139], Andy Deck (b. 1968) developed an interface in which any viewer can modify or change



139 **Andy Deck**, *Glyphiti*, 2001. Although certain elements in this project have been fixed by Deck, including colour (black and white only) and size, users have the freedom to change the individual glyphs that make up the site and leave their own mark. Designed to function across most firewalls, *Glyphiti* bears similarities in graffiti in its appropriation of private space for fun.

140 **Mongrel**, *Linker*, 1999.
A prototype for *Nine(9)*, *Linker* aimed to enable sophisticated visual self-expression to those not exhaustively versed in graphics software. Similar to an application like Adobe Director but smaller and scrappier, this free software employed 'drag-and-drop' functionality to create rich multimedia maps.

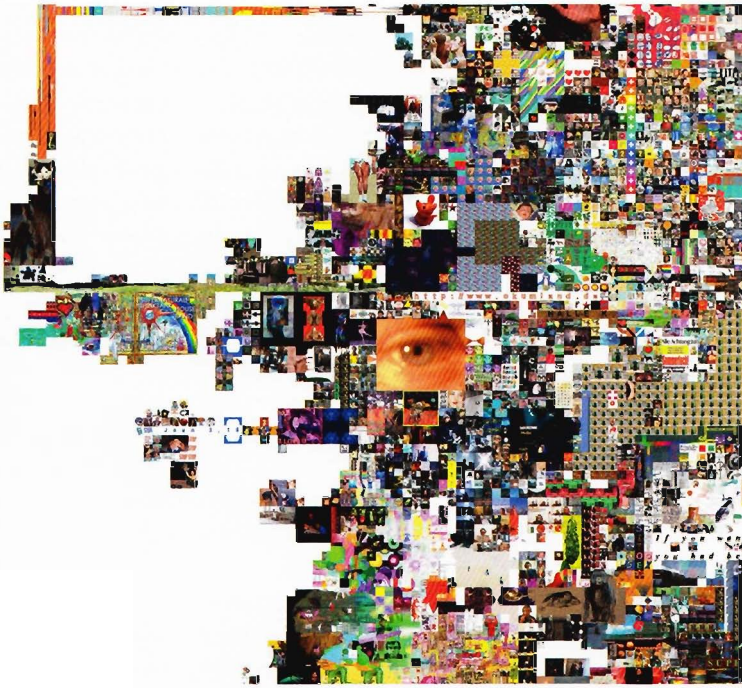
visual elements. Its collaborative edge is that it is designed to function across most firewalls (hardware or software lines of defence, used by institutions or companies to protect private data or prevent employees from partaking in leisure activities). A similar work is *communimage* [141], launched in 1999 by programmers c a l c and Johannes Gees. A democratic collage of graphics uploaded by visitors, as well as communication tools for people to form relationships around their participation, *communimage* offers large-scale, eccentric, visual juxtapositions.

If internet technologies allow for friendly encounters around image maps, the rhetoric of social and creative processes can also drain collaborations of their critical potency, rendering them highly documentary or formal. An important work of collective software, *Nine(9)* (2003) [143–144], created by Mongrel's Graham Harwood and commissioned by the Waag Society in Amsterdam, inscribes collaboration into a social context by allowing users to create simple multimedia 'knowledge maps' that can be linked to

communimage zoom help image mover upload

Above left and opposite above right:
141 **c a l c** (Teresa Alonso Novo, Looks Brunner, tOmi Scheiderbauer, Malex Spiegel, Silke Sporn) and **Johannes Gees**, *communimage*, 1999

Below right:
142 **Josh On, Amy Franceschini** and **Brian Won** of **Futurefarmers**, *Communiculture*, 2001. Like other software projects described in this chapter, *Communiculture* is geared towards group use, valuing the relational, interactive expression of ideas. In the section entitled 'what can we do about art on computer?', for example, one could place an avatar between a participant who notes that 'computer art allows people to share and communicate' and another whose forthright belief is that 'art is art. Computers are tools.'



choose area

info

facets

linklist

postcard

message board

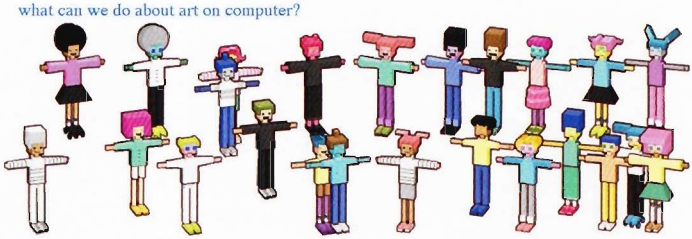
realspace

community CULTURE

A DIVISION OF FUTUREFARMERS

login or signup

what can we do about art on computer?



visit the persons website who made this continuum.

those made by other participants. The links of *Nine(9)* maps are accompanied by automatically generated emails that aim to create connections between users; at the same time, Perl scripts search out other shared features across maps. Named after the difference in years between female life expectancies in Jamaica and Sweden, the project was developed in reaction to another social imbalance: most graphics and media production software, such as Director or Photoshop, are designed almost exclusively for experts. Like *communimage*, the project is somewhat crowded and disorientating to the eye: since users have published medleys of snapshots and other media, *Nine(9)* has the tempo, scale and visual diversity of a scrolling view of a city street or crowded park. That all its borders meet, and not one knowledge map takes precedence over another, puts a political aesthetic of equality at the centre of the work. And like all the software works previously discussed, *Nine(9)* suggests that the community of the internet can and should be democratized by expanding the ranks of who can use it, and how.

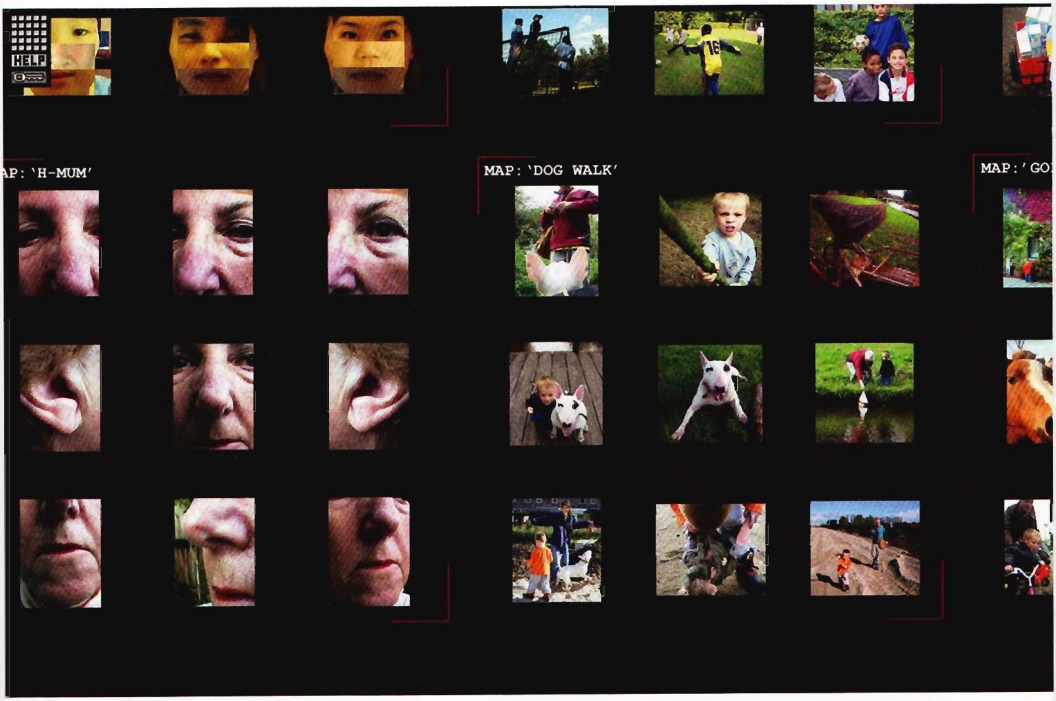
The Crash of 2000

By 2000, an emergence of a number of books and academic courses on net culture and related subjects indicated that online art forms were considered an instructive and vigorous intellectual force. The increase in international museum and festival commitments to online art, the ongoing support from media centres, and the formation of new forums in South Asia and South America registered widespread recognition and relevance. Many curators eagerly took on internet-based work and found ways to execute exhibitions in educational contexts and a slew of smaller venues, such as Eyebeam in New York, the C-Level in Los Angeles and Cornerhouse in Manchester, England. Museums and galleries also sought to keep up, their staff struggling to deal with the technical issues related to curating, hosting, displaying and archiving internet art, even as many of their work routines were becoming dependent on tools like email and web servers. By 2000, it had become more customary to peruse the photographs or documentation of an artist via his or her web site, but the prospect of maintaining emulators needed to preserve software from the mid-1990s was a much more specialized, expensive and technical enterprise.

At the same time, however, net art suffered palpable losses in prestige and funding alike. The collapse of the American stock market in spring 2000, after years of prosperity driven by information technology (since 1995, more than a third of American

Opposite above:
143 **Mongrel**, *Nine(9)*, 2003. This collaborative software project enables nine groups or individuals to share texts, images and sound and explore the social make-up of their communities through so-called 'maps'. Tracking word frequency in order to represent the content of archives and find links between users, *Nine(9)* is able to accommodate 729 knowledge maps in total (nine groups, each containing nine archives, with nine maps per archive).

Opposite below:
144 **Mongrel**, two images from *Nine(9)*, 2003. The images on the left and right are taken from the maps 'Killing Snails' and 'No Camping' respectively.


HELP
AP: 'H-MUM'
MAP: 'DOG WALK'
MAP: 'GO

economic growth had resulted from information technology enterprises), brought with it a sense of cynicism about the internet. The market's breakdown led to major cutbacks in endowments in the United States and resulted in a more conservative climate in museums and funding sources nationally (these would only be exacerbated by the Republican policies in subsequent years). Unlike television and film, which shared a more consistent trajectory of success as forms of mass media, the net was tainted by economic failure, demystified hype and market-less ideas. As internet-related businesses shut down in waves, 'gold rush' days were proclaimed over and 'paper millionaires' (those whose wealth relied on unrealistic company valuations, stock options or securities) were dismissed as greedy and opportunistic entrepreneurs. Television news specials seemed to match critical assessments of net art when they pronounced the internet 'dead'.

In the first few years of the twenty-first century, these deaths would become manifest as the earliest notions of the autonomy and distinctiveness of the internet began to weaken and fade, and net art practices moved closer to other cultural fields such as tactical media, free software and film (i.e. rich media formats, such as animation and video). In the hands of artists, the net would often approximate a black market, suggesting a panoply of responses to the legacy of the dotcoms and net.art.

145 **Harwood/Mongrel**, *Uncomfortable Proximity*, 2000. In one of the first commissions of the Tate's net art initiative, Tate Online, Harwood copied large sections of the real Tate web site, incorporating text and images that dramatized the exclusivity and myopia of the 'British social elite' who have historically controlled and used the museum. Text on the site reads: 'The construction of the collection…is a construction of the British social imagination…an example of economic power organising itself around the politics of the aesthetic.'