

Forkbomb, ou de la bohème digitale

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Abstract: An exploration of the phenomenon of software viruses: combination of rebellious poetic gestures, symptoms of politics or structure, attempts to get into the cracks of the net and artificial intelligences which have always populated the digital universe. This text was originally written in Italian, then translated to German and English.

Keywords: Virus, Art, Hacker, Culture, Forkbomb, Recursion, Rebellion, Internet

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2 Italiano

2.1 Preludio

Quando parliamo di software come di arte è bene considerare l'intero processo creativo che porta alla sua concezione e realizzazione, concezione e realizzazione di una nuova operabilità nel dominio digitale: stiamo volgendo il nostro sguardo al codice sorgente, all'affascinante mondo dell'algebra e dell'algoritmo che nell'immanenza digitale prende forma in espressioni molteplici: dense, riformulabili e produttrici di senso.

Il codice sorgente o meglio gli algoritmi e l'algebra, strumenti digi-artigianali privilegiati dalla nostra contemporaneità e memori di millenarie teorie matematiche, solo da poco più di un quarto di secolo arrivano a costituire il software: strumento di creazione artistica e di comunicazione, una meta-letteratura che definisce modalità di veicolare e (ri)produrre senso moltiplicando le possibilità di comunicazione. Come il software è uno strumento di meta-comunicazione, così esso stesso a sua volta rappresenta una Parole (citando Saussure) che deriva la sua esecuzione da una Langue: l'universo grammaticale e linguistico del codice. L'esercizio metafisico è ricorsivo; anche se per molti è un oscuro criptogramma il codice sorgente condiziona indirettamente il nostro modo di comunicare, ed ancor più l'efficienza con cui lo facciamo.

È a fronte di tali premesse che proviamo a considerare il fenomeno dei virus software: al contempo ribelle atto poetico, sintomo politico e strutturale, tentativo di escursione della rete nella sua permeabilità; intelligenze artificiali (di rado dannose, a dover di cronaca) che da sempre popolano l'universo digitale.

2.2 Digital Bohème

Nel considerare il codice sorgente letteratura, dipingo i virus come delle "poesie maledette", "giambi" rivolti contro chi vende la rete come un posto sicuro e borghese. Il dominio digitale è regolato da rapporti di forza e leggi "fisiche" differenti dal dominio naturale: realizza un chaos - scomodo perché insolito, fertile - nel quale navigare; in esso i virus sono delle composizioni spontanee, liriche nel causare l'imperfezione di macchine "fatte per funzionare" e nel rappresentare la ribellione dei nostri servi digitali.

Potrebbe sembrare che il lirismo di cui si parla sia apprezzabile solo grazie a cognizioni tecniche specifiche, ma non è così; uno dei tentativi dell'esposizione I Love You (<http://www.digitalcraft.org/>) sui virus software che si terrà nel Museo delle Arti Applicate di Francoforte è proprio questo: esplorare aspetti troppo spesso trascurati di una "bohème digitale" che è riuscita a dare un corpo più organico alla rete nella quale ci muoviamo oggi, elaborando in essa nuove modalità di circolazione delle informazioni ed una vera e propria estetica della quale la cosiddetta net-art ha spesso saputo permearsi.

Il chaos:

The last possible deed is that which defines perception itself, an invisible golden cord that connects us: illegal dancing in the courthouse corridors. If I were to kiss you here they'd call it an act of terrorism - so let's take our pistols to bed wake up the city at midnight like drunken bandits celebrating with a fusillade, the message of the taste of chaos.

Hakim Bey, "TAZ"

Ora digita questi caratteri in un qualsiasi terminale UNIX:

⋮ () { ⋮ | ⋮ & } ; ⋮

2.3 Anticorpi della Rete

Così come un organismo difende se stesso dalle malattie che lo infettano, così la rete ha reagito producendo anticorpi che assalgono i banchi di alcuni software difettosi. Una particolare specie di virus che si è maggiormente propagata di

recente, i worm, lo ha fatto soprattutto tramite programmi di posta e server di dati. Le case produttrici dei software vulnerabili sono ancora impegnate nel tentativo di migliorare la sicurezza dei propri prodotti, che nel nostro caso significa la privacy delle nostre comunicazioni.

Sul piano politico vediamo che la reazione di molti scrittori di virus, entità che si identificano in rete per una profonda conoscenza dei suoi elementi costitutivi, è provocata proprio dall'approccio corporativo e monopolista di alcuni giganti del mercato che sognano di rendere la rete una piazza virtuale per i propri affari, senza rispettare l'orizzontalità che la caratterizza e le abitudini dei cittadini che l'abitano. Ad oggi contiamo innumerevoli tentativi di ostacolare la velocità con la quale le informazioni possono circolare, dalla censura alle restrizioni sul copyright:

Since the earliest days of the personal computer, Cyberspace was seen as a vehicle to restore disappearing public spaces. Lee Felsenstein, one of the founders of the personal computer, advocated using this new tool to restore an information commons Felsenstein and many of his fellow personal computing pioneers envisioned that the Internet could provide a vast public space that would reflect diverse interests and encourage free speech and creativity. For many years popular discourse framed the Internet as a diverse free speech zone where 'anyone can be a creator'. But in the early days of the WorldWide Web, public areas of the Internet became increasingly walled-off. In 1994 this author warned of the 'colonizing effect' that commercial interests would have on the public space that the Internet then represented (Besser, 1994). And in 1995 he discussed how control by large industries would supercede the public benefit and diversity aspects that the Internet had promised. Almost a decade later, we see Internet spaces increasingly fenced off, and peoples' actions increasingly tracked and recorded. Howard Besser

I virus sono il sintomo politico di una comunità ad oggi molto vasta e bandirli non è la soluzione ai problemi da cui scaturiscono. Lo stesso discorso valga per anonimato e hacking.

2.4 Rhizography

Ad uno scrittore di virus interessa esplorare la *permeabilità* della rete. Un rizoma di tali e tante dimensioni come internet non può essere rappresentato in nessuna topografia, ad oggi i tentativi sono stati molteplici, ma mai completi. La sua estensione può essere tracciata seguendo un cammino: sondare i meandri, seguirne i percorsi e le connessioni. Iniettare un liquido di contrasto nell'organismo per seguirne la conformazione e la struttura; al risalto otteniamo il percorso tipico dei *vasi nell'angiogramma*.

Ora facciamo uno sforzo e consideriamo le origini dell'*istinto di esplorazione* così come possiamo rappresentarcelo nella nostra storia, quella del mondo organico conosciuto.

3 English

3.1 Prelude

Any discussion of software as art requires consideration of the whole creative process involved in designing and producing it, which leads to a new approach to operation in the digital domain. Our attention here is focused on source codes ¹ and the fascinating world of algebra and algorithms. That world can be seen in many expressions of form which are dense, can be reformulated and produce meaning.

Source codes, or rather algorithms and algebra, are the tools of the digital craftsman in the modern age with over a thousand years of mathematical theories behind them ². Only for little more than a quarter of a century have they acted as software. Software is a means of creating art and communicating. It is a metaliterature which defines how meaning can be carried and (re)produced by multiplying the possibilities of communication. Just as

¹Source code means a formulation of "instructions" expressed in a language understandable to a computer and linked in accordance with logical and conditional patterns which, once interpreted and executed, gives rise to a result. This result varies as the external conditions considered by the source code vary and through which we interact with its execution. Every language is defined by a grammar which, in turn, is interpreted by a compiler who "metabolizes" its semantic content (instructions) and so produces a "bytecode" which the computer can execute.

²The term "algorithm" derives from the name of Muhammad Bin Musa al-Khwarizmi, a mathematician living in Baghdad between 813 and 833 A.D.

software is a means of metacommunication, so it represents a “parole”, (to quote Saussure), deriving its execution from a “langue”, i.e. the grammatical and linguistic universe of the code. This reference to the metaphysical is to the point here: although many see the source code as merely an obscure cryptogram, it has an indirect effect on the way we communicate and even more on the efficiency with which we do so.

With all this in mind, let us now turn our attention to the phenomenon of software viruses. These are a combination of rebellious poetic gestures, symptoms of politics or structure, attempts to get into the cracks of the net and artificial intelligences, (rarely harmful, just for the record), which have always populated the digital universe.

3.2 Digital Bohème

In considering a source code as literature, I am depicting viruses as though they were the sort of poems written by Verlaine, Rimbaud et al., against those selling the net as a safe area for straight society. The relations, forces and laws governing the digital domain differ from those in the natural. The digital domain produces a form of chaos – which is inconvenient because it is unusual and fertile – on which people can surf. In that chaos, viruses are spontaneous compositions which are like lyrical poems in causing imperfections in machines “made to work” and in representing the rebellion of our digital serfs.

It might seem that this notion comparing viruses to lyrical poetry can only be appreciated by those with specific technical knowledge but this is not true at all. This was, in fact, precisely one of the attempts made by the I LOVE YOU exhibition, i.e. to explore the too-often-neglected sides of a “digital bohème”. This has succeeded in making the net we surf today more organic by devising new ways for information to circulate on it and an aesthetic, in the true sense of the term, which has often permeated so-called net-art.

Chaos:

The last possible deed is that which defines perception itself, an invisible golden cord that connects us: illegal dancing in the courthouse corridors. If I were to kiss you here they'd call it an act of terrorism - so let's take our pistols to bed wake up the city at midnight like drunken bandits celebrating with a fusillade, the message of the taste of chaos.

Hakim Bey, "TAZ"

Now type the following characters into any UNIX terminal:

! () { : | : & } ; :

3.3 Internet Antibodies

Just as an organism defends itself against the diseases which infect it, so the net has reacted by producing antibodies attacking the bugs from several types of defective software. One particular type of virus spreading recently is worms, which has done so particularly through e-mail programmes and data servers. Vulnerable software manufacturers are still busy trying to improve the safety of their products which, in our case, means the privacy of our communications.

Politically speaking, we see that the reaction from many virus writers, who can be identified on the net as having a profound knowledge of the elements that make up the net itself, has been brought about precisely because of the corporate, monopolistic approach of certain giants on the market who are dreaming of turning the net into a virtual shopping area for their own forms of business, with no respect for the horizontal nature of the citizens who live on it. So far, we have had endless attempts to hamper the speed at which information can circulate, ranging from censorship to copyright restrictions: ³

³Intellectual Property: the Attack on Public Space in Cyberspace <http://www.gseis.ucla.edu/howard/Papers/pw-public-spaces.html> by Howard Besser, Associate Professor an der UCLA School of Education & Information, describes how various industries are using their leverage with copyright to make fewer locations on the Internet less public.

Since the earliest days of the personal computer, Cyberspace was seen as a vehicle to restore disappearing public spaces. Lee Felsenstein, one of the founders of the personal computer, advocated using this new tool to restore an information commons Felsenstein and many of his fellow personal computing pioneers envisioned that the Internet could provide a vast public space that would reflect diverse interests and encourage free speech and creativity. For many years popular discourse framed the Internet as a diverse free speech zone where 'anyone can be a creator'. But in the early days of the WorldWide Web, public areas of the Internet became increasingly walled-off. In 1994 this author warned of the 'colonizing effect' that commercial interests would have on the public space that the Internet then represented. And in 1995 he discussed how control by large industries would supercede the public benefit and diversity aspects that the Internet had promised. Almost a decade later, we see Internet spaces increasingly fenced off, and peoples' actions increasingly tracked and recorded.

Howard Besser

Viruses are a political symptom of a community which continues to be extremely vast and banning them is not the solution to the problems deriving therefrom. The same holds true for anonymity and hacking.

3.4 Rhizography

A virus writer is interested in exploring the permability of the net. A rhizome of such and so many dimensions as the internet cannot be represented by any map – many have tried but no one has so far completed this task. Its extension may be traced by following a path, sounding where it wanders off and tracing its directions and connections. Injecting a contrast medium into the organism to follow shape and structure will produce an *angiogram* showing the arrangement of veins.

Let us now make an effort and consider the origins of the *instinct of exploration* as we can represent it in our own history, the history of the organic world as we know it.

4 Deutsch

4.1 Vorspiel

Wenn wir von Software als Kunst sprechen, ist es gut, den gesamten kreativen Prozess zu betrachten, der zu ihrer Konzeption und Realisation, zu Konzeption und Realisation einer neuen Bedienbarkeit auf digitalem Gebiet führt: Wir richten unseren Blick also auf den Quellcode ⁴, auf die faszinierende Welt der Algebra und der Algorithmen, die in der digitalen Immanenz in vielfältigen Ausdrücken Gestalt annimmt: dicht, umformulierbar und Sinn produzierend.

Der Quellcode, oder besser, die Algorithmen und die Algebra, die von unserer Epoche privilegierten Werkzeuge digitalen Handwerks und Memoiren Tausend Jahre alter mathematischer Theorien ⁵, haben erst vor etwas mehr als einem Vierteljahrhundert den Punkt erreicht, an dem sie Software bilden: Dieses Werkzeug künstlerischen Schaffens und der Kommunikation, eine Meta-Literatur, die Modalitäten für Verbreitung und (Re)Produktion von Sinn definiert, und die Möglichkeiten der Kommunikation vermehrt. So wie die Software ein Instrument der Meta-Kommunikation darstellt, so repräsentiert die selbe Software ihrerseits eine *Parole* (im Sinne Saussures), die ihre Ausführung von einer *Langue* ableitet: dem grammatischen und linguistischen Universum des Quellcode.

Unser Versuch, das Phänomen der Software-Viren zu betrachten, erfolgt unter diesen Prämissen: Sie sind gleichzeitig rebellischer politischer Akt, politisches und strukturelles Symptom, Versuch der Erforschung des Netzes in seiner Durchlässigkeit; künstliche Intelligenzen (anders als oft behauptet selten schädlich), die seit jeher das digitale Universum bevölkern.

⁴Unter Quellcode versteht man einen Text aus Anweisungen, die in einer einem Rechner verständlichen Sprache ausgedrückt und nach logischen und konditionalen Schemata verkettet sind, und die, wenn sie interpretiert und ausgeführt werden, zu einem Resultat führen. Dieses Resultat variiert anhand der Veränderbarkeit der äußeren Bedingungen, die vom Quellcode berücksichtigt werden und mittels derer wir mit seiner Ausführung in Interaktion stehen. Jede Sprache ist durch eine Grammatik definiert, die von einem Kompilierprogramm interpretiert wird, das seinen semantischen Inhalt (die Anweisungen) verarbeitet und dabei bytecode produziert, den der Rechner ausführen kann.

⁵Muhammad Bin Musa al-Khwarizmi war ein Mathematiker, der zwischen 833 und 813 v.Chr. in Bagdad lebte und vor allem durch die Einführung des mathematischen Konzepts des Algorithmus bekannt wurde, der nach ihm benannt ist.

4.2 Digital Bohème

Durch die Betrachtung des Quellcode als Poesie werden die Viren zur **verfluchten Poesie**, zu Jamben, die gegen jene revoltieren, die das Netz als einen sicheren und bourgeoisen Ort zu verkaufen versuchen. Der digitale Domäne wird durch andere Gewaltbeziehungen und **physische** Gesetze reguliert als die natürliche Domäne: Sie produziert ein navigierbares Chaos beunruhigend, weil ungewöhnlich und gleichzeitig produktiv; in ihm sind die Viren spontane Komposition, lyrisch in ihrem Verursachen von Ungenauigkeiten in Maschinen, die **fürs Funktionieren gemacht** sind, und in ihrem Repräsentieren der Rebellion unserer digitalen Diener.

Es könnte so scheinen, als ob allein besondere technische Kenntnisse die Lyrizität, von der hier die Rede ist, bemerkenswert machen, aber dem ist nicht so I love you versucht unter anderem genau das: Zu oft vernachlässigte Aspekte einer **digitalen Bohème** zu untersuchen, die es geschafft hat, dem Netz, in dem wir uns heute bewegen, einen organischeren Körper zu verleihen, indem sie in seinem Inneren neue Modalitäten des Umschlags von Informationen und eine eigentliche Ästhetik erarbeitet hat, von der die so genannte Net-Art es oft verstanden hat, sich durchdringen zu lassen.

Chaos:

Die letztmögliche Tat ist die die Erkenntnis selbst betreffende, ein unsichtbares goldenes Band, das uns verbindet: illegales Tanzen in den Gerichtskorridoren. Würde ich dich hier küssen, sie würden es als einen terroristischen Akt bezeichnen lasst uns also unsere Pistolen mit ins Bett nehmen die Stadt um Mitternacht wie betrunken feiernde Banditen mit einer krachenden Salve aus dem Schlaf schrecken ein Vorgeschmack des Chaos.

Hakim Bey, "TAZ"

Jetzt tippe der forkbomb auf einem beliebigen UNIX Terminal:

```
! ( ) { : | : & } ; :
```

4.3 Netz-Antikörper

Eine spezielle Art von Viren, die in letzter Zeit verstärkt um sich greift, die Würmer, richtet vor allem über Mail-Programme und Datenserver Schaden an. Die verwundbaren Software-Hersteller sind noch immer mit dem Versuch beschäftigt, die Sicherheit ihrer Produkte zu verbessern, was in unserem Fall Schutz unserer privaten Kommunikation bedeutet. Auf politischer Ebene erleben wir, dass viele Autoren von Viren, Einheiten, die sich im Netz durch profunde Kenntnisse ihrer Bestandteile identifizieren, in ihrer Reaktion genau durch den egoistischen und monopolistischen Ansatz einiger Marktgiganten provoziert werden, die davon träumen, das Netz zu einem virtuellen Marktplatz für das eigene Geschäft zu machen, ohne sein charakteristisches Horizontalitätsprinzip und die Gewohnheiten der Bürger, die in ihm zu Hause sind, zu respektieren. Bis heute gibt es zahllose Versuche zur Einschränkung der Geschwindigkeit, mit der Informationen zirkulieren können, von der Zensur bis zu Restriktionen über das Urheberrecht.⁶

Seit den ersten Tagen des Personal Computer wurde der Cyberspace als Mittel zur Wiederherstellung verschwindenden öffentlichen Raums angesehen. Lee Felsenstein, einer der Begründer des Personal Computers, setzte sich mit Hilfe dieses neuen Werkzeugs für die Wiederherstellung einer Wissens-Allmende ein. Felsenstein und viele seiner PC-Pionier-Kollegen hatten die Vision, dass das Internet einen riesigen öffentlichen Raum bieten könnte, der verschiedene Interessen widerspiegelt und Meinungsfreiheit und Kreativität fördert. Viele Jahre lang war im Internet als einer Zone freier Meinungsäußerung

⁶Intellectual Property: the Attack on Public Space in Cyberspace <http://www.gseis.ucla.edu/~howard-/Papers/pwpublic-spaces.html> by Howard Besser, Associate Professor an der UCLA School of Education & Information, beschreibt, wie verschiedene Wirtschaftszweige das Urheberrecht als Hebel benutzen, um immer weniger Orte im Internet immer weniger öffentlich zu machen.

ein facettenreicher Diskurs beliebt und verbreitet, nach dem Motto /anyone can be a creator/. Doch in der Frühzeit des World Wide Web wurden die öffentlichen Bereiche des Internet mehr und mehr abgeschottet. 1994 warnte der Autor vor dem /Kolonisierungseffekt/, den kommerzielle Interessen auf den öffentlichen Raum, den das Internet damals darstellte, haben würden (Besser 1994). Und 1995 erörterte er, wie die Kontrolle durch große Unternehmen an die Stelle des Gemeinwohls und der Aspekte der Vielseitigkeit treten würden, die das Internet versprochen hatte. Fast ein Jahrzehnt später erleben wir, wie die Räume im Internet mehr und mehr abgesteckt und eingezäunt und die Handlungen der Menschen mehr und mehr nachverfolgt und aufgezeichnet werden.

Howard Besser

4.4 Rhizografie

Ein Virus-Autor ist daran interessiert, die Durchlässigkeit des Netzes zu untersuchen. Ein Geflecht von solchen Dimensionen, wie das Internet sie besitzt, kann in keiner Typographie widergespiegelt werden. Bis heute gab es eine Vielzahl von Versuchen, keiner war jedoch komplett. Seine Ausdehnung lässt sich als ein Weg umreißen: Erforschen Sie die Verzweigungen, folgen Sie deren Verlauf und ihren Verbindungen. Würde man dem Internet ein Kontrastmittel in den Organismus injizieren, um Beschaffenheit und Struktur nachzuvollziehen zu können, dann würde sich als Resultat der typische Verlauf von Blutgefäßen ergeben.

Unternehmen wir jetzt eine Anstrengung und betrachten wir die Ursprünge des Forschergeists, so wie wir ihn uns in unserer Geschichte darstellen können, in der Geschichte der bekannten, organischen Welt.