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# Linux for Theatre Makers: Embodiment & Nix Modus Operandi

## Nancy Mauro-Flude

Author's note: This is a text I wrote during my MA in Media Design at Piet Zwart Institute, in response the Thematic Project 'Command Line Culture' September – December 2006 led by Florian Cramer (the course director). From the perspective of a performing artist, and as a developer of the /Eclectic Tech Carnival [http://eclectictechcarnival.org/] I discuss my observations on how using the command line interface may be seen to possibly co-constitute one another in everyday life, operating as fields of embodied reflection.

## ntroduction

*The overriding desire of most children is to get at and see the soul of their toys, some at the end of a certain period of use, others straight away. I do not find it in me to blame this infantile mania; it is the first metaphysical tendency. When this desire has implanted itself in the child's cerebral marrow, it fills his fingers and nails with an extraordinary agility and strength. The child twists and turns his toy, scratches it, shakes it, bumps it against the walls, throws it on the ground. From time to time he makes it re-start its mechanical motions, sometimes in the opposite direction. Its marvellous life comes to a stop. The child, like the people besieging the Tuileries, makes a supreme effort; at last he opens it up, he is the stronger. But where is the soul? This is the beginning of melancholy and gloom.*
*– Charles Baudelaire, 17 April, 1853*

My central thread in this text is the Linux computer operating system (OS) and more specifically the use of the command-line interface within this OS and its relationship to embodiment.[1]

Since bodies and machines are often seen in opposition, I suggest that they are better perceived as complementary in nature rather than antagonistic. For people who have never worked with command line computing on a standard *nix machine[2], especially people who are already conditioned to point

[1] Hereafter, I will refer to the computer operating system as OS.

[2] For the rest of the essay I specifically refer to Linux, one of the many Unix operating systems. I also am a user of the terminal on the Mac OSX based on Open BSD, so I talk from both perspectives. Although both of these operating systems are different from Linux, which is a kernel wrapped in one of the many distributions, there are numerous similarities between Unix and Linux systems. For an account of the genealogy of the Unix machine and its offsprings of *nix derivatives, Linux, BSD see 'An alternative history of *nix – machine(s) = person(s) | dev/*nix' by Martin Hardie, http://www.openflows. org/~auskadi/nix1.pdf Linux is specific because it is not proprietary, i.e. the source code is

made available for users to modify and extend upon. Finally, I am required by Law to write *nix, instead of UNIX as Calum A. Selkirk (2004) writes: '...I used the term '*nix' to denote Unix, or more precisely Unix-like operating systems, this is due to the fact that "Unix" is a trademark, and as such cannot be used in this way. However, as the operating systems we are discussing owe their historical roots to AT&T's "Unix", we will describe them generically as "*nix"'.

[3]
Hereafter, I will refer to Graphical User Interfaces as GUIs.

[4]
For a description see 'GNU's Not Unix! – Free Software', GNU General Public License, http://www.gnu.org/copyleft/gpl.ht.ml http://www.nettime.org/Lists-Archives/nettime-l-0506/msg00042.html 'Free software is a matter of liberty not price ... Free Software Foundation, established in 1985, is dedicated to promoting computer users' rights to use, study, copy, modify, and redistribute computer programs. The FSF promotes the development and use of free software, particularly the GNU operating system, used widely in its GNU/Linux variant. The FSF also helps to spread awareness of the ethical and political issues surrounding freedom in the use of software.' http://www.fsf.org

and click methods cultivated by Graphical User Interfaces (GUIs)[3] such as Windows OS or Mac OS, this involves sensitising procedures (such as one may endure with any new instrumental skill acquisition) for the operation of code as a series of interrelated programmes. I will discuss how using the command line interface may be seen to possibly co-constitute one another in everyday life, operating as fields of embodied reflection.

I propose that the body, like any organism, is a protean reality in constant flux and it is in this sense that I'd like to consider some of the OS applications from the GNU/Linux community, I am specifically referring to the non-proprietary tools that are developed to use in a command line interface.[4] I position myself along the same vein as Martin Hardie who reads 'Unix as consistent with more philosophical descriptions of thinking or of living life itself.'[5] Indeed the spreading development and use of Linux operating systems and free software has political implications. As Alan Sondheim (1999) writes:

> *linux is, if not art, at least fashion, wearable, at problematic variance with capital (punk for example), useful for intruders, the mouth and tongue for some.*

I hope to elucidate how the regular use of a computational interface, command line or GUI, has deep physiological effects. I question why it is mostly the case that the GUI is presented as a *given* to the regular computer user. Since information feudalism affects not only information society and subsequent issues of ownership, privacy, sharing – clearly seen in the over-abundance of patents and agreements to *harness the user*, which in my view, is an attempt to strip humanity of all civil freedoms; what products to use, what plants to grow and consume, what seeds to cultivate, and to an extent our ability to even engage with molecular living matter is being restricted.[6]

**Long Live the Amateur and Eclectic Hacker!**

> *Custom, that obscure crossroads where the constructed and the habitual coalesce, is indeed mysterious.*
> *– Michael Taussig (1993)*

In light of Merleau Ponty's method of phenomenological description and dealing with experiences in raw reality, I choose to write this paper in a personal register, because general divides between practice, theory and the self-referential, replicates harmful objectifying, and empirical models.[7] I'll also acknowledge my own corporeal complicity in the way in which I view the subject, as Kathy Acker so aptly stated 'Politics don't disappear they take place inside my body'[8], *political* for me always comes through the personal. A critique I have is that a large majority of people who contribute to the discourse about *nix have a desire to produce totalising accounts without any regard to cultural difference. As in all situations, I believe there are varying ways or modes of participation. In the following section I shall trace out some of the more salient benefits in relation to approaching learning in the spirit of an amateur.

I consider whether Linux tools can instigate, as well as create, represent and respond to intuitive working methods for a broader community – outside the field of free software developers and end-users and not as a way of living or being separate. I will also propose that engagement in thought, as in any repeated action where the body is foregrounded, the regular use of technology both hardware and software, has physical effects on who we are and how we consider our sense of self. I focus upon the inter-corporeal and sociological aspect of 'the user' rather than the cybernetic debate.[9] My basic premise is, if we consider that genuine and meaningful communication with other humans is a necessary and gratifying part of life, as computers begin to take the centre stage of many of our daily lives (for those of us in the metropoles), I emphasise we may want to be aware of the consequences of the decisions that we are (perhaps not) making, in our choice of OS as communication apparatus.

Is humanity in great danger of losing its diversity? It has never been so possible to speak so convincingly of global civilization as it is today. For those of us in the metropoles are we becoming unable to discern with any clarity the manner in which our own perceptions and thoughts are being shifted by our sensory involvement with consumer electronic technologies?

For more on the FSF and a definition of Free Software see, http://www.fsf.org/licensing/essays/free-sw.html and philosophy http://www.gnu.org/philosophy/philosophy.html

[5]
Martin Hardie, 'Time Machines and the Constitution of the Globe', 2005, http://www.nettime.org/Lists-Archives/nettime-1-0506/msg00042.html

[6]
A local example is when I went to the dentist and got my wisdom tooth taken out, I wanted to keep it, since it had a large curl on the root of the bone, like my curly hair, that I was curious about, but the dental institute would not let me keep it due to sterilization laws. I felt it was an infringement on my private body since I cultivated the raw material myself who were they to keep and inscribe a law regarding my own flesh!? ... A broader example of how artists (especially in the USA) are vulnerable is the PATRIOT Act which has made freedom of speech questionable. For instance, see the ongoing debate about Critical Art Ensemble who by simply communicating corporeal experience in a performance installation, are persecuted for alleged involvement in acts of bio-terrorism.

[7]
The idea behind this is to safeguard the phenomenological moment of analysis whilst juxtaposing a

Foucauldian genealogical perspective, for a discussion of this in relation to Merleau-Ponty's work read Perspectives on Embodiment: The Intersections of Nature and Culture, G. Weiss and H.F. Haber (eds), Routledge, New York, 1999.

[8]
Karen Brennan, 'The Geography of Enunciation: Hysterical Pastiche in Kathy Acker's Fiction' in Boundary 2: an international Journal of Literature and Culture, Summer 21:2, 1994, pp. 243–68.

[9]
For writings in this area see N. Katherine Hayles, My Mother Was a Computer: Digital Subjects and Literary Texts, Chicago: University of Chicago Press, 2005.

[10]
Circuit Bending is the creative implementation of audio short-circuits.

[11]
Most obviously in Toydeath where I performed under the name of s.g.ballerina, 'Picture a hyper band of aliens channelling through a broken AM radio, and someone's playing with the speed control. But the Hendrix-worthy feedback wails are actually the sirens of toy fire engines. The spastic beats courtesy of model helicopters. Toydeath proves that punk ain't dead, it's just moved into the toy box.' http://minorkeys. tripod.com/reviews. html

If this combination is insupportable to some readers, pray let him/her stick with my explanation, rather then we should part company here, as I explain how the infusion of different fields of discourse can create new ones. Opening up normally closed circuits can create a myriad of new parameters, which may presage an emergent paradigm shift...

I write here as a *nix machine neophyte or *newbie* although for at least a decade I have been involved with human machine interaction, for example, inter-mixing dance theatre pieces with software for live and/or online telematic performance situations, or circuit bending[10] electronic toys in punk bands to push the instruments into other dimensions.[11] This could be called *hacking* because I feel the need to extend materials (and situations) beyond their particular given limitations.[12] Usually this action is an improvised reaction that unfolds itself as a sensual process and spontaneous desire rather than a reverend discipline, so therefore I am not a geek.[13] Probably, I do not deserve to define myself with the term *hacker* since I did not discover circuit logic in a sophisticated way, nor do I look for how connections complete their loops in order to then break them or think in terms of 'problems' that need to be solved. I usually just start playing, wasting a lot of time dreaming and aimless wandering, until someone with that knowledge points out the fundamentals to me and then I try and absorb the information whilst continuing in my own idiosyncratic experiential manner.

I am enchanted when I look inside machines and I like to touch their inner parts, I guess this stems from my childhood, as when someone would turn the TV off, I'd run to see if I could catch the people leaving from behind, curious and mystified. According to Baudelaire, 'This is the first metaphysical tendency.' In his 'Philosophy of Toys' he suggests that 'In their games children give evidence of their great capacity for abstraction and their high imaginative power.' I come from a cultural tradition where personal creative practice is done for the eventual benefit of society to maintain the prosperity and health of all of the people, not just the atomised individual (your profession here...) artist, or movement, so it is mainly in meaningful collaborative contexts I find such acts profoundly thrilling.[14]

Apart from the black box in the theatre, I did not ever expect there to be another vessel deep enough to hold all these moments and abstractions of experience and potential until I experienced the dark magic space of the shell. However, first and foremost, I must claim I find much of Linux geek rhetoric far from affable, my own conviction is that such a revision in attitude carries concrete and far-reaching implications beyond our understanding of the *nix operating system. Calum Selkirk (2004) in a concise and elegant description of 'shell basics' admits that 'These concepts are often difficult to grasp for someone completely unfamiliar with programming.' He continues:

> *It is for this reason I spend probably more time than is perhaps necessary explaining them, often with the most simplistic of examples.* [15]

Does this explanation ensure to the reader they must be a moron if he/she should not understand his detailed simple explanations of the command line interface? No – these are regular humorous antics of the field, as hacker Eric Raymond (2003) reminds us: 'To do the Unix philosophy right, you have to value your own time never to waste it'.[16] A most extreme case of tech-humour (or is that megalomania?) we can witness here in an interview with Radia Perlman, an expert at networking protocols and distinguished engineer at Sun Microsystems, tells us of her stringent desire to abolish an intimate social custom that extends back to 6th century BC; Frauenheim (2005) recounts:

> *Thinking about smart communication strategies is something that comes naturally to Perlman. She even sees room for improvement in the way people clink glasses during dinner toasts. 'That actually drives me crazy', Perlman said, 'because it's an inefficient protocol'.* [17]

Steeped in superstition and self-preservation, a toast for many people is a spontaneous and congenial tradition, which binds us to each other. It is outrageous to overplay the intellectual aspect of collective human experience, and define knowing as strictly a function of the rules and categories appealing to the cognitive mind, to the exclusion of sensory

[12]
http://en.wikipedia.
org/wiki/Hacker_
definition_controversy

[13]
I am involved in
various projects
that suggest that
when women-centred
activities are
foregrounded people
usually expect me to
subscribe to the
rules or often
identify me with a
geek, because some
of these focus on
Free Software based
workshops. My desire
is driven by sharing
information with
people who don't get
access to it or
cannot afford it,
and with those women
who do not have the
confidence or even
think they deserve
to learn anything
because they were
brought up in
extraordinary,
challenging
environments. See:
http://eclectictechca
rnival.org
http://genderchangers
.org;
To see if you are a
geek you need to
take 'The Geek
Test',
http://www.innergeek.
us/geek.html

[14]
As opposed to
physical
conditioning,
disciplines that
became techniques to
generate rules and
exercises in order
to produce
functional
escalation in the
army and finally in
civil society.

[15]
Calum A Selkirk,
'Shell Basics.v1.1',
2004,
https://pzwart.wdka.
hro.nl/mdma/staff/
cselkirk/Documents/
shell_basics.Pdf
I want to confess
that it has taken me
1.5 years to fully
understand this

text. However, should my confession prove me low in intellect? I am a graduate of the University of Sydney obtaining first class 1:1 honours, which placed me in the top 5 percent mark of Australian Universities for the year 2000. I could not possibly have destroyed all my brain cells since then, so this might then perhaps give some kind of legitimate proof that I am considered, not only by myself, to possess adequate mental ability. The point I am trying to make is -- if I give this text to a person who has never even heard of *nix, and only grew up thinking Windows machines are available and was to be introduced to the world of free software rhetoric they have no way to enter such discourse.

[16]
Eric S. Raymond, 'The Art of Unix Programming', 2003, http://www.faqs.org/docs/artu/

[17]
Ed Frauenheim and Gilbert Alorie, 'Opening doors for women in computing: Harvard president's comments re-ignite debate over women in computer science, with reformers trying to reverse guy-centric patterns', 2005, http://news.com.com/Opening+doors+for+women+in+computing+-+page+2/2100-1022_3-5557311-2.html? tag=st.num

[18]
Matthew Fuller, Behind the Blip, Essays on the Culture of Software, Autonomedia:New York, 2004.

factors. The body is not a programmed machine but an active and open form, continually improvising its relation to things and the world. Moreover, as Matthew Fuller (2003) states:

> *Free Software is too internalist. The relation between its users and its developers is so isomorphic that there is extreme difficulty in breaking out of that productive but constricted circle.* [18]

I advocate that geeks should leave these structures of discourse behind them! Otherwise by now all of the experiences with command line tools and all their responses in the shell would already have been anticipated from the beginning, already programmed, as it were into the initial Unix kernel.

What fascinates me is that for a significant amount of us, which is a massive majority of the world population who actually use computers, do not even know that a spectrum of OS choices are even available! Let alone about the GNU/Linux or free software foundation (FSF), which exists to insist people should have the freedom to choose and modify the technology they use in the way they see fit and not be restricted by economics or reductive proprietary laws. If people are talking about greatly enhancing our communication models, I suggest that users and/or creators of free software, or *nix developers, who until now habitually operate in isolation, need to appreciate different modes of being, in order to share the potential of human development in regard to embodiment, language, information and communication technologies. Why are users and/or developers of x etc, involved in totalising accounts of human interaction? – whereas we might expected them to be more open-minded. The teleological attitude, conventions and the allocation of roles, of some hardcore technocrats is intimidating and in regard to optimizing smart communication strategies it seems rather disingenuous (and also a total come down).

### The Shell vs Terrestrial Gravity, and Inertia

The rubric of GNU/Linux is a vista of permissive, open-ended media as the source code is free to be used, developed and extended. Specifically, users of command line tools have

endless variables, executed by programmers inhibited by and
impatient with the limitations of the GUI. Martin Howse
suggests:

> *Alternatively living coding at the command line;*
> *that horizontal prompt proving a horizon for*
> *contemplation... And thus to the application of a*
> *new discipline, expanded software; endophysical*
> *interface and Alice in Wonderland. (another*
> *beginning marked)'.*[19]

When I first discovered the power to delete the file in my OpenBSD
terminal that the OSX finder could not trash I felt was no longer a
prisoner inside my machine, only possessing knowledge of a GUI, I was
formerly stuck in a holding pattern. Using x you keep moving all the time,
discovering always new executable codes sensitive to commands.

In the shell I find a marvelous mess of constellations, nebulae,
interstellar gaps, awesome gullies, that provokes in me an
indescribable sense of vertigo, as if I am hanging from earth upside
down on the brink of infinite space, with terrestrial gravity still
holding me by the heels but about to release me any moment. An
example is /dev/null – a special *nix file where you pipe your
unwanted data flow through this output. When I first experienced
viewing data disappearing into this file, I immediately had an
epiphany about the black hole and how the theory of the event
horizon might function in an every day context.[20]

Sondheim (1999) has a similar perspective on the abyss-like nature of
the shell,

> *2. The graphic interface opens to shells as well, and since*
> *the inter-face devolves from a blank screen, there is*
> *simultaneously potential (click anywhere on it) and absence*
> *(nothing visible), reflecting upon the human operator /*
> *monitor interface as well.*

The experiential in the *nix world is truly an unvalidated mode. I
believe that the meaning of life is to be uplifted, to be in a euphoric state
and make art that reflects this experience of traveling through the
manifold of time. All you need is humility and imagination for the
'baroque protocol' as Howse (2006) suggests:

[19]
Martin Howse,
'Version Control
1.6' in [the] xxxxx
[reader]xxxxx,
OpenMute Print-on-
demand services,
2005,
http://openmute.org

[20]
In response I made a
/dev/null Doll, see:
http://sistero.org/
devnull/doll/

> *All patches, software encodings, algorithmic elaborations*
> *for either space should prove readily extensible (in the codified*
> *realm, heavily abstracted and based on message passing, in the*
> *social realm driven by baroque protocol) and concerned with*
> *an extreme escalating overmapping of expanded and reduced*
> *software domains. The problem states itself as that of the*
> *practical and the experiment. Substance.*

In the *spirit* of the awe-inspired or amateur, a very particular experiential learning aspect and protocol is set in motion, especially in the mode and register of collaborative communication when you working at this level you have a massive advantage, not only do you enjoy a certain level of freedom – when you don't *really* know what you are doing – but you do things with tools that other people would not do, whereas a professional attitude has all these constraints. Ironically x experts or in general technocrats who have certain defined methods and formulas, end up becoming completely unintelligible to people outside the Information *Communication* Technology culture.

**Vessels of Infinite Veracity**

> *You seek for knowledge and wisdom as I once did; and I*
> *ardently hope that the gratification of your wishes may not be*
> *a serpent to sting you, as mine has been.*
> *– Mary Shelly Frankenstein (1818)*

Perception is precisely about this reciprocity, the ongoing interchange between the body and the entities that surround it, and can be seen as a form of 'expanded software script (human)'. (Howse, 2006) Therefore, I am curious about the development of the human form in regard to long-term computer usage. We experience our world as fabric woven together out of inextricable sensory threads, not as individual sensory media, nor as individual data. Whatever account we give of experience not only must take this synaesthetic motif into consideration, but also begin with and from it. As Howse explains:

> *On the other side, the human, and within a narrow context*
> *the meta, the xxxxx/PLENUM experiment attempts a*
> *simultaneous overmapping of both realms using operatic,*
> *logical and holographic technique dressed up in the emperor's*
> *new clothes; the expanded software script (human) translated*

*into machine and meta-human-machine operation. We would rather view interface in terms of a Gunter Brus incision than a question of design and GUI.* [21]

When operating a computer we are connected to the machine by means of our human body, including its movement and skills as well as the senses and linguistic activity. As a Linux user we are a creator, engaged in a dynamic, symbiotic dance with the computer. In *Matter and Memory* Bergson confirms the process of affect with all that we encounter, he writes,

> *...we have to take into account the fact that our body is not a mathematical point in space, that its virtual actions are complicated by, and impregnated with real actions, or, in other words, that there is no perception without affection. Affection is, then, that part or aspect of the inside of our body which we mix with the image of external bodies. (1911: 38)*

From the perspective of the actual machine, Sondheim (1997) affirms the uncanny nature of Linux referring to its physical like form:

> *Beyond the traditional division of graphic user interface (GUI) and text-based interface, the Unix and Linux system/s create a unique environment problematising machine, boundary, surface, and structure.'*

Linux engages in a dimensional model, it leaks, each programme is bound up within the other. The vast amount of command line tools and *nix concepts, file names, paths, wild cards, input and output redirection, regular expressions apply to many different commands. The recurring concepts seem to transcend most kinds of simple breakdown. As my command line experience grows, I find myself returning to these. Slowly I delve deeper into the possibilities, specific tasks and commands seem more like membranes, because they define a surface of metamorphosis and exchange. The entire system can be controlled and tweaked by the user, in this sense; the OS has a subjective aesthetic by its very substance, which blurs the line between two self-contained realms of human and machine.

This is why I advocate that the GNU/Linux shell should be approached as an OS in flux responding to the output and needs of a living community, for if the user's awareness is not locked up in the density of a

[21]
PLENUM was a project in March 2006. As audience you are also part of an emerging expanded exchange where the interaction via the software is reflected during the dialogue itself, http://kop.kein.org/ plenum/html/ documentation.html The software used was Pure Data. As Howse writes, 'We could begin to unravel expanded software (the realm of PLENUM) using the example of a network to be mapped within our software; mapping the connections of Alice (in Wonderland, through the Looking Glass)...' Howse, Op. cit.

[22]
Loss Peqeño Glazier,
'Jumping to
Occlusions' in
Digital Poetics,
1997, http:// epc.
buffalo.edu/authors/
glazier/essays/
occlusions/

[23]
I first heard the
concept 'operating
system as process' in
the 2006 Thematic
Project Command line
Culture at Piet Zwart
Institute lead by
Florian Cramer.

[24]
The Wings, an area of
the stage not visible
to the audience.

closed and bounded object, the ability for the machine to extend itself to a network is also open and indeterminate. Hence, change and transformation in every aspect of human life is imminent, to such an extent that life itself is being transformed. As Loss Pequeño Glazier (1997) has remarked, 'The language you are breathing becomes the language you think'.[22]

This is the inter-corporeal level of using a networked computer, since I even begin to experience myself in an expansive networked or socio-centric sense rather than an individual egocentric sense. If the human intellect is rooted in, and borne by our contact with the multiple shapes that surround us, what is the impact of the computer, becoming more embedded in our daily lives, upon our bodily membrane?

You need to approach the Linux OS as a continual learning process[23], as such, (for the command line *nix user), you need to initiate the system maintenance operations, it requires the constant need to monitor and intimately understand the functioning of the machine. Under the surface of the computer's interface, processes seethe with undiscovered activity. Since an OS runs many daemons and services, many of these processes merely wait for actions to occur – one example is a cupsd process, which is a background daemon of the CUPS printing system. This process waits for you to call it to work, it lies back stage in the wings just watching to see if it is needed, and this is passive activity that uses very little processor time or memory.[24] But only the Linux command line will show you the actual parsing of these processes and at least with my experience with the Gentoo distribution it will not spoon feed the user informing them when updating their world needs to be done.

Therefore I believe that the constant need to monitor and intimately understand the functioning of the Linux machine also deepens our kinaesthetic awareness about our own anatomy, physiological and kinesiology systems. Further, Hofstader in *Gödel, Escher, Bach: An Eternal Golden Braid* recounts a moment when he was showing some friends the PARRY programme, when some of the OS information came up in the terminal after a mistyped mistake, they asked 'why are you over-typing what's on the screen?' To which he explained,

> *The idea that 'you' know all about 'yourself' is so familiar from interaction with people that it was natural to extend it to the computer – after all, it was intelligent enough that it could*

*'talk' to them in English! Their question was not unlike asking a person, 'why are you making so few red blood cells today?' People do not know about that level – the 'operating system level' – of their bodies.' (1979: 301)*

I propose that after prolonged use of Linux, people will begin to develop more sensitivity to their own need for inner maintenance because of its labyrinthine architecture; this is 'expanded software, a timed response'. (Howse: 2006) This information can be experienced as dwelling within the body apparatus. Having awareness of our inter-cellular processes leads to a change in physical experience, a change in sensation.[25] No doubt from my experience in experiential movement techniques, such as Laban Movement Analysis, ideokinesis, Alexander Technique, I am more open to this.[26] But what I am implying is that this is the sort of silent conversation that we carry on with things with our proprioceptive facilities, a continuous dialogue that is a proto-linguistic state, for instance, when the hand readily navigates the space between the fingers and the keys on the computer.

With Linux I begin to understand and have an idea of the most important processes and how to manage them, for example, with 'top' command I can get information on my system and its operations. When Sondheim (1997) writes in point 4 in his tenets:

> *Phenomenology of Linux / Unix: 4. It is easy to assume that source code is equivalent to bones and operable binaries to flesh; or the kernel as fundament, and file structure as slough. I would rather argue for a system of cubist plateaus of intersecting information regimes, with vectors / commands operating among them. In this sense it is information that is immanent within the operating system, not any particular plateau-architecture.'*

An understanding of these processes will no doubt help me to practically manage my Linux OS, but perhaps it also may help me relate to my own physicality. After a while, I suspect I may find potential problems that vampirize my machine's processing speed, runaway processes, broken sessions which never properly terminated, and I may

[25]
The feeling of such change is then reported back to the central nervous system by the proprioceptive apparatus. Nancy Udow (1977) refers to psychological research studies by Washburn (1916) and Schilder (1950) which, through 'the use of electromagyograms and electroencephelograms have shown the presence of muscular activity and brain waves during a mental motor image which are similar to those activities and waves during overt movement'. Theatre Papers Archive, 1977 – 1984, Dartington College of Arts, UK, http://www.spa.ex.ac.uk/drama/research/exeterdigitalarchives/main.html

[26]
After much experimental research and training in touch and repatterning techniques learnt at the Institute for Somatic Movement Studies I can access my own and other bodily cellular tones. The tone can be explained in how the intercellular and extra cellular fluid is flowing in and out of the cell's membrane; this can be reflected at many levels e.g. low (not enough intercellular fluid), high (too much fluid inside the cell) of the organ, http://www.somaticmovementstudies.org/

simultaneously detect blockages in cell movement in my body – which slows down my nervous system's ability to provoke or control the release of hormones and in turn may diminish nerve impulses.

Understanding the internal micro-choices and actions our automated nervous system performs every moment of our living existence, the same as the instrumental process of learning tools, writing scripts for managing programs and processes; getting information on process and shutting down processes, just as there are kinetic techniques that are often used for longevity. Neil Stephenson (1999) observes this complexity:

> *Many Hackers have launched more or less successful re-implementations of the Unix ideal. Each one brings in new embellishments… Thus Unix has slowly accreted around a simple kernel and acquired a kind complexity and asymmetry about it that is organic, like the roots of a tree, or the branching's of a coronary artery. Understanding it is more like anatomy than physics.*

Delving deeply into the myriad tools available in Linux and exploring possibilities of the entire file system, this concentration and imagination can actually stimulate and facilitate material, physical change in the human body. I advocate this may have more benefits then just powerful processor speed, script automation and multitasking. As it seems at the moment, prevalent is a strange sort of vanity based on identity, form and high end graphics, which is becoming more and more removed from the actual living human organism.[27]

Perhaps over the years the g-term use of GUI's may see its end-users becoming like the pathetic monster's of Mary Shelley's *Frankenstein*, their walk staggering and jerky, their reach clumsy and inaccurate, reflexes spasmodic; unaware of his labyrinthine space of the middle ear, careening about the environment, every movement a source of danger to himself and others. As regular computer users I fear we are losing our ability to sense our own inner communication and physiological processes and, I conjecture, using Linux OS might be a way to return to this. So early in history Mary Shelley recognized this danger and predicted the perils of the technological society and the GUI!

Perhaps her fiction was not about the easy Hollywood version of the uncontrollable man-made monster, I have a hunch that this great work was about the horror of a human who didn't have the capacity to imagine realms of abstraction or even their very own inner veracity. The body I

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here speak of is very different from the objectified body where
the emphasis is on the Skeletal-muscular system, that complex
machine whose broken parts or stuck systems are diagnosed by
westernised medical doctors. Underneath the anatomized and mechanical
body that we have learned to conceive, dwells the subjective body as it
actually experiences things, this poised vessel that initiates our projects
and suffers our passions.

[28]
http://www.
cryptonomicon.com/
beginning.html

**Protect Me from What I Want…?**

> *You said it, my good Knight! There ought to be laws to*
> *protect the body of acquired knowledge. Take one of our good*
> *pupils, for example: modest and diligent, from his earliest*
> *grammar classes he has kept a little notebook full of phrases.*
> *After hanging on the lips of his teachers for twenty years, he's*
> *managed to build up an intellectual stock in trade; doesn't it*
> *belong to him as if it were a house, or money?*
> *– Paul Claudel, Le soulier de satin, Day III, Scene ii*

If bodies are complex systems embedded in the environment, what
does this mean when we experience a saturation of media images on a
daily basis? In fact I often feel my communication has been so corrupted,
to that extent that I hardly ever watch television, yet its sound bites have
infiltrated my own speech. Here Stephenson (1999) makes a connection
between the mass media and the GUI:

Disney is in the business of putting out a product of seamless illusion – a
magic mirror that reflects the world back better than it really is. But a writer
is literally talking to his or her readers, not just creating an ambience or
presenting them with something to look at: and just as the command-line
interface opens a much more direct and explicit channel from user to
machine than the GUI, so it is with words, writer, and reader.[28]

The Graphical User Interface (GUI) is the most commonly used OS and
for most people perceived as an efficient and effective tool because of its
point and click interface. However, according to Nielsen & Gentner (1996),
if people opt for the GUI it ultimately limits human communication and
even our ability to imagine the intangible:

> *The see and point principal states that users interact with the*
> *computer by pointing at the objects they can see on the screen. It's*
> *as if we have thrown away a million years of evolution, lost our*
> *facility with expressive language, and have been reduced to*
> *pointing at objects in the immediate environment. Mouse*

*buttons and modifier keys give us a vocabulary*
*equivalent to a few different grunts. We have lost all*
*the power of language, and can no longer talk about*
*objects that are not immediately visible...*

Internalising enough of what seem inscrutable and cryptic
commands that can be used quickly at appropriate times, is
indeed an arduous initiation process; especially after the
seemingly decadent but limiting life of the GUI. In due time as in
any learned routine, working with the command line, or so I am
told, the keystrokes will become hard-wired in my fingers and I will learn to
automate maintenance and do backup commands with cron, or combine
commands in hundreds of shell scripts. The material limitations one faces in
any instrumental process and indeed when using the notoriously powerful
*nix core, is certainly unapproachable for most of us, especially when one
encounters a black hole when syncing and updating or then having to
unemerge blocked packages.[29]

After about three years of listening to 'distro wars', the multiple and vexed
opinions about which Linux distribution to actually install and use, in general,
most people tried to 'protect me' from installing Gentoo Linux, which
arguably, brings one closer to understanding the OS intimately than most
other distributions (that is, apart from Linux-from-Scratch).[30] Eventually the
installation, even with experienced support people guiding me, felt similar to
that of a rite-of-passage, or making a pact with the Devil. However, no
learning is easy, and in fact it should be frustrating, as when things are
frustrating, that means we are learning – frustration is a necessary part of the
learning curve. As I have said, the operation of Linux is a continual process,
which, like most developmental patterns gives rise to new situations with
each new stage of sensory information and language integration.

However, it is common that people now want things to be neatly
packaged with a snazzy logo. Even education is catering more to the rules
of economic rationalism, than to a deep pedagogical function. Nielsen
Gentner (1996) suggests the inevitability of computers in our daily lives,
and how this idea of time investment should be reflected in the
educational system:

*Today's children will spend a large fraction of their lives*
*communicating with computers. We should think about the*
*trade-offs between ease of learning and power in computer-*
*human interfaces. If there were a compensating return in*
*increased power, it would not be unreasonable to expect a*

*person to spend several years learning to communicate with computers, just as now we expect children to spend 20 years mastering their native language.* [31]

[31]
Jakob Nielsen and Don Gentner, 'The Anti-Mac Interface', http://www.acm.org/pubs/cacm/AUG96/antimac.htm

What skills are OS users prepared to learn, what contexts are they prepared to situate themselves in, really? Indeed end-user alternatives are easy to propose, but difficult to put into practice, especially when they are presented as natural but exist by force of habit. Jef Raskin (1993) writes:

[32]
Jef Raskin, 'Down with GUIs!', 1993, http://www.wired.com/wired/archive/1.06/1.6_guis.htm

*GUIs have become so pervasive (or is it perversive?) that many computer users can't even think about anything else as a human-computer interface ... But GUIs are modal from the get-go. Now that you've read this you know that interfaces which are far less modal are possible, but you should be warned they are habit-forming, even addictive. Start to use them and you are hooked forever...*[32]

[33]
Samuel Weber, 'Texts/Contexts', in Institution and Interpretation, Minneapolis: University of Minnesota Press, 1987, pp. 3-17.

In general, the actual shifting of inertia, of habitus, that is entailed in asking people to make perceptual shifts, is something we have to come to fully understand and work through. Weber describes this resistance:

*because such fixed habits become, by virtue of their very fixity and hence inflexibility, incapable of dealing with changing and infinitely variable circumstances (1987: 14)*[33]

I find it remarkable that there has been hardly any research into the changes wrought by the massive use of particular computer OS's, nor has there been consideration of the long term impact and benefits of everyday usage.

In the wake of increased computational usage, it is an important moment for people to want to actively continue to reinvent language. Yet even in spite of their severity, computer languages have caused a tremendous creativity because there was, so far, no power to discipline them, as Sondheim (1999) has noticed: 'for some of us, Linux *has* changed the language'. If I consider the paranoia and the will to fix forms by software patent acts and extend this to the people who make their source code protected by copyright laws and international treaty provisions, it's clear that the compulsion for this finds its origin in a very particular and limiting view of the world. It is among other things, also handing over control to a fixed conceptual discourse of the Law.

[34]
Graham Harwood,
'Cartography and the
Technologies of
Location',
http://www.scotoma.org/
notes/index.cgi?Carto
Tech (Accessed 12
December 2006).

[35]
http://www.
medienkunstnetz.de/
themes/generative-
tools/read_me/

Language as such has long been seen as simply a copy of a world and not something that is proto-linguistic, heteroglossic, and constantly adapting, changing. Some of this is due to the unfortunate result of mandatory schooling and the introduction of a national grammar. Much of our natural ability to acquire languages (which we might well say is in fact the essence of language) has already been lost. As the relation between so-called dialects and the 'core-language' show, the dialects are primary, not the core-language, rather, the standardized language is the derivative. All groups of people inevitably are from a language specific to them. This was something mis-understood about sign-language for a long time. However, place a number of deaf people from different sign-languages together and they will soon be speaking a new sign-language. But hope springs eternal, standardization of language/code is always trailing behind the current state of things.

As I have explained, language and code are not fixed or ideal forms, but an evolving medium we collectively inhabit, a vast topological matrix for which our bodies are generative sites. While individual speech acts are guided by the structured lattice of the language, that lattice is nothing other than the sedimented result of all previous acts of speech, and here we can see how Linux code itself is altered by the very expressive activity it now guides. As Harwood comments,

> It seems software exists in some form of invisible shadow world of procedure … Software is establishing models by which things are done yet, like believing the objectivity of maps, we forget that software is derived from certain cultural, historical and economic trajectories.[34]

In 'Read_me, run_me, execute_me: Code as Executable Text: Software Art and its Focus on Program Code as Performative Text', Inke Arns specifically attributes code work to an economic class: 'These works use the poor man's medium, text, which also appears performative or executable in the context of the command line.'[35] Language and implied rules and protocols have always been principal instruments of the control process and unrestricted creativity is considered to be dangerous. According to Clive Phillpot, it is preventing any major social revolution when he reminds us:

> There is no need to ban books since a significant percentage of the population – usually the most deprived, who have the most to gain from reading and changing the status quo –

*cannot read them. Instead we have to try to ban pictures and music because even the illiterate people can read pictures and understand lyrics.*[36]

If we are to take real-life social stratification into consideration, although it costs nothing (except the price of a computer, lots of time, a certain education), for the moment, code work and understanding Linux is definitely not a 'poor man's' tool or 'modus operandi'.

## If you Make a Mistake with a Wildcard the Consequences are Serious...

The embodiment process in Linux is relational and interactive, in *[the] xxxxx [reader]*, Howse (2006) writes 'Code leaks both ways across a broken-world interface.' I hope it is clear why above I advocate a revision of the discourse in general, since I believe this knowledge is necessary to understand in order to extricate the discussion of the cognitive from the limitations inherent within this text's presupposition of *simply asking everyone to switch to command line computing.*

To have a noticeably wider participation in the new developments in the language influenced by Linux, is to be fully aware of the current problems of this language and convinced of its extreme importance, notwithstanding more awareness. Ultimately the human capacity for reflection, planning and manipulation of our environment brings with it the responsibility of choice, but first and foremost, we need to be open and inform people that there is a choice. Above all, it seems important to recognise differences within, as well as beyond the borders of the Linux community or people will continue to fall into corporate traps of people like Bill Gates' idea of what a personal computer is, and Disney's limiting idea of what constitutes entertainment.

Furthermore, when source code is made available I think of it more as having reverence for other people's work. To be able to acknowledge, then copy that work or code and then try to understand how that person thought and felt – but always bringing in my own idiosyncrasies and vision to that, in the understanding that all these efforts are related, and have a larger common purpose. We are always faced with the problem of getting on with our own necessary process of self-discovery, which for regular users of computers, should also entail finding out how their operating systems work, discovering their internal system, language and power.

Our ability to create, plan and code our environment makes us responsible for what we create and for how we choose to live in that creation. Since all of us are, always-already, living on the edge of our own destruction, as Howse (2006) writes,

> *too much knowledge of programming. We can see this*
> *clearly in programming terms such as continuations, stack*
> *and, of course, memory. Yet such simple facts bear repetition;*
> *past and future are inherent within computation. The Turing*
> *tape moves backwards and forwards, according to specific*
> *instructions on that tape... And finally, it's not for nothing that*
> *Turing and indeed the entire field of computation is obsessed*
> *with the halting problem. When will it end?*

Because I keep wondering what happens if these entire systems continue
to process even though basic human understanding has broken down.