

Introduction

Lace is a textile that exist since the beginning of times. It is technology, and a complicated one, filled with instructions, protocols, grids and patterns, methodes, movements, tiny stitches, and made by women in networked activity.

Computers are complex calculators that communicate. Women are complex beings, that like to communicate. Computer has protocols, patterns, grids, instructions.

Women are famous for their capacity to talk on the telephone, for being the secretaries, the ones that made notations in encrypted language for their bosses and very quick in type writers. They were the computers, making the calculations for researches and during war times.

Computers, the internet and women seem to be made for each other, but instead the statistics show that the opposite is true:

(EU (15 countries) Science and technology graduates: males 13.0 females 5.5).

Popular culture says computer technology is something for men.

Cyberlace is a project where I attempt to take a piece of lace, analise it, live with it, and think about that missing element in the connection between lace, women and digital technology.

The lace and it's stitches

Last year I saw a site on the Internet about an initiative to help Brazilian lacemakers make some money.

The north-east of Brazil is as poor as poor can be. The coast has all the wonderful beaches one can dream of but a couple of kilometres inward it is a semi-desert place of unbearable poverty, an area away from every resource of civilization. One of the most important and widespread activities in the area is lace making done by women. They are known as "rendeiras" and they mainly lace pieces of cloth nobody can really use, cloth which can hardly be worn because the fabric is full of holes. It takes an enormous amount of time to produce these pieces of textile that lack a real function, and it is not fashionable.

The most common use for this cloth is underneath that "special" silverware you have when you serve tea or coffee to visitors (how many households use this?). These women work hours to make these goods and even use the threads as one would use money as a means to pay for and exchange items from one to another. Some villages survive solely on this activity. In a statistic from a very poor province (Paraíba) where it happens it is shown that as many as 1/4 of the total of the women living in the area are active as lace makers¹. They are old women, mothers, female teenagers and girls. They live in habitations without basic sanitary systems, and have no access to public institutions.

Why do generations of uneducated women work so hard to make something that brings them little money or any social perspective? (They exchange their threads with each other, but it as means of exchange cannot buy anything from a non-lace making group in the village or outside) This work seems to be done for no other reason than financial ones. The fact that it is easily done makes me think it is some sort of "second nature" to these women. One would think that making lace is something easy to do.

¹ .(IEDEMI/Sebrae) – Brazilian Service to Support Small Bussiness

Well, easy?

Making lace requires the ability to make such tiny stitches that the lace maker must have good eyes and very refined motor skills because of the precise movements done by the fingers. That is the lace maker's body. Mentally she (it is almost always a SHE) has to have much patience and accuracy to get the stitches right because they are sometimes so tiny that after a day worked the lace maker barely has a piece of cloth. It takes more than a million stitches for the beginning of some effect.

The lace maker has to be able to do stitches following a pattern that in its turn is made from a grid. This grid is the ground for the drawing and also a ground to be followed when little pins are fixed in a base of hard material. Around these pins, threads are wrapped following diverse procedures: there are different kinds of stitches and there are different ways to make them follow a pattern. This is just one of the procedures for doing lace. There are others, like deconstruction of textile, or a very tiny needlework on top of a pillow where the pattern is drawn. They all have their own strict procedures based in grids and patterns.

Attention must be big (there was a piece of lace making hardware, from glass filled with water, to produce concentrated light so the lace maker could see the stitches she was doing that sometimes were as thin as a hair). Making lace requires the ability to make very small and diverse stitches and at the same time have in the back of one's mind the big picture: what the fabric must be.

The lace maker has to be able to a plan made before the work started, and to follow this plan. Some of kinds of lace are made of several smaller pieces of lace stitched together to form a big cloth. In these cases, the smaller pieces are done by different women, to be assembled by yet another women. Because this has a form of a production line, planning that enables to coordinate a group's work needs to be done and followed. At the end all the pieces together are made in such a way they are what they were initially planned to be. For instance the one bigger piece of cloth made of multitudes of different smaller patterns and stitches.

Besides this all, lace makers do their lace with such a speed and precision and hability, that it is described by everybody that sees it as "looking like machines".

Actually the first lace machines had been designed with the movements lace makers do as model for the machine.²

Last year, when I went to one of these villages in Brazil and one of the lace makers told me she knew the piece she was working on was made by a specific women, living much further, because the lace makers from the area improvise stitches and make them personal. It raised several questions that were not answered, but good as questions: Does the "jammed" stitches communicate something from one lace maker to another?

It seems that textile in its history has had the hability to have narratives embeded in it, not only by the drawings that the threads make, but also by its hability to carry data about who and how many textile workers did this piece, what they did and how (for instance, by the shape and kind of stitches). In creating her own stitch so that the other lace maker knows she did that particular piece is it encrypting data? Is it the beginning of an idea of "protocol", (A protocol is the "language" of the network. A method by

² Zeros and Ones by Sadie Plant. Pg. 65

which two dissimilar systems can communicate. TCP is a protocol, which runs over a network.)

These ideas were raised because I come from another (digital) world. Working with computers, I see myself dealing with similar requirements as these women: be able use my fingers accurately and quick (I type with it), be able to think on small functions inside a bigger texture, like a button that opens a browse window in a certain way inside a web page. A website, for instance, is a relatively simple kind of application and yet, you find different scripts and patterns and languages combined. There is html, xml, mysql, php or asp, perl, and so on.

Writing code, needs patience and enormous attention to detail. It looks so natural that code pieces make these machines work, that few people are aware of the amount of work that there is behind a piece of working application.

Digital work, both of them, is work that cost an enormous amount of time.

I see parallels between my digital activities here and their (digital) activities in the north of Brazil. For instance the fact that the support I had for my digital activity was from a group of women: an Internet woman-only mail list of digital workers, where I actually learned my first coding steps: they answered all my stupid, simple beginner questions with the motto: "there is no stupid questions, just stupid answers". (<http://www.womenontheweb.nl>)

It is also a parallel with the lace makers, the fact that I found computer work more suitable for me as a mother having to adapt to the children's schedule, problems and wishes than any other activity.

Internet

Working on the Internet, having "virtual colleagues", friends all around the world Internet technology made possible to live on the "border". It still is a space - possibility to be present here and there, to speak and hear this language and the other, to hear what is going on there while you're here and follow the steps the culture there takes while transforming itself, and keep on with your daily life living in your foreign land.

Been a women (also in the quality of a foreigner women), I already had some experience living in such a place, a border, because a foreign women has something from grey spaces where "the keywords" that selects me in the society always labeled me: women, foreigner -a second best with some fuzziness made from the mix between two backgrounds.

Internet always felt like home to me, with it's promise of living in between cultures, nations, spaces, interests. All from my computer at home while I was able to do some monitoring of my child growing. The amusing part of this, is that lace, in its origin was the habit to stitch together the textile threads that were left hanging, when clothes were worn out. Lace is a border, in the sense that it is the frontier, the end part of the shirt, dress, or other piece of cloth. In this sense, when it transforms a ugly, worn out textile to something worse while wearing, it encrypts in its history the "will" to transform: to re-use what is worthless in something precious.

Somehow the internet has had this connotation to me: even if it is this place that is no place, but connections computers make. It is a free zone built of kilometres of coded language that exists above nations and physical kilometres. It took me out of the experience of been not complete as a person, since half of my history and connections were done somewhere else in the world. And also from the experience of been not

complete since as a woman I am still supposedly in need for a man to work well in society (this is sadly still true). In the Internet space a zone where I can do an activity women seem to be good at: communicating, I felt powerful.

Lace has its meanings as a border, Internet as a bridging space, and as last from this row of borders, women has a history of life lives in the periphery of man's history: A history of lives lived behind men, making their connections, noting their thoughts, following their rules.

I am at this side of the digital divide; the Brazilian lace makers are at the other side. I see that technology not only got me closer to these women because of its capacity and promise to bridge borders, but also because their lives is built upon a technology (a old one) but one that shows how natural is it to women to live up to requirements digital work.

Mailists Xperience

I am certainly not the only woman to do her best to work from home while taking care of children. As a matter of fact, there are mail lists on the Internet that give tips to digital workers mothers that also work from home. Several of these tips include the children also having some programming and computer experience, like for instance threads on the Systers³ network specially on this issue:

“Frankly, there are jobs which lend themselves better to integration into the family and I think the ICT industry is one of the better.”

Or multitasking strategies:

“In the other hand, I had a lot of time to think and plan while trying to stay awake feeding my kids. Keep a notepad, pencil, and cordless phone near your feeding area.”

Looking at lace makers, in Brazil as well as in Belgium, (I want to exclude here more industrial areas of lace making, like in England) I saw the same strategies of working and caring at the same time. In Belgium until the begin of the 19th century and in Brazil until now, lace is done by women organised in groups: one group does the lace and one more experienced, older lace maker, sells it. This organisation is a “flat”, non hierarchical one: all the parts have the same authority towards the final product. From the bibliography I could find in this subject, I had the impression the fact that lace makers organised themselves in a less hierarquical way, carried some responsibility for making the lace making – stitching making , activity sustainable even during war times.

Anyways, it seems that the textile industry and with it, lace making activity wich has been developed for centuries by women, is connected with women work as far as that the making of the industrial machines themselves were based in movements, organisation and actions.

“While the industrial revolution is supposed to have made the break between handheld tools and supervised machines, the handmade and the mass-produced, the introduction of technology to more primitive textile techniques is both a break with the old ways and a continuation of the lines on which the women were already at work. Even before its mechanization, the loom was described as the "most complex

³ www.systers.org. The Systers email list was created by Anita Borg in 1987 for technical women in computing. Nowadays an informal organization for technical women in computing that began in 1987 as a small mailing list for women in "systems", thus the name systers. There are now over 2500 systers in 25 countries.

human engine of them all," not least because of the extent to which it "reduced everything to simple actions: the alternate movement of the feet worked the pedals, raising half of the threads of the warp and then the other, while the hands threw the shuttle carrying the thread of the woof." When John Heathcote, who patented a lace-making machine just after Jacquard built his loom, first saw "a woman working on a pillow, with so many bobbins that it seemed altogether a maze", his impression was that lace was a "heap of chaotic material". In an attempt to unravel the mystery, he "drew a thread, which happened to draw for an inch or two longitudinally straight, then started off diagonally. The next drew out in various directions. Out of four threads concurring to make a mesh, two passed one way, and the third another and the fourth another still. But at length I found they were in fact in an orderly manner..." It was then a matter of producing "a fabric which was an exact imitation of the thread movements of handmade lace." This is both the ordering of chaos, and also how its networks replicate themselves.²

If you analyse elements of work done by women in textile, would you be able to adapt these elements to digital work done with computers, to show how it is close to what women is already been trained to do for centuries?

Is work with textiel able to carry elements that can be used by women to do other kinds of digital work, like computer related work?

Europe has its own digital divide.³ Even though there are enough initiatives to help women to use computer technology, there is still a gap.

In one interview the list moderator from the women on the web in the Netherlands, told me the idea that technology and computer technology is something from the realm of men is still alive and kicking. She told me she could see for instance when standing at computer fairs that the amount of man visitors was much bigger than women and the women that were there were mainly as company's to their husbands and friends. Other mail list moderator I interviewed noted that whenever she would go to a store to buy computer or computer accessories with a male friend, the salor will talk with the friend even though she was the one that asked the question. These experiences are not strange to me either.

The question puzzles me: how come computer technology is so strongly connected to the male while the one that operated related machines, like the telephone, the typewriter, the telegraph, the calculator were almost always women? And when the making of textiles, that involves habilities similar to those used in computer coding was women's work?

The Weblog

I "sensed" that there must be other important factors that makes digital technologies still far from the "female world", but I wanted to hear and see what "common sense" had to say about that. How women experienced their connections with computers and how they would see digital work in textile and digital work in computer would relate. This is why I decided to put up a web log and on line gather as much material that could be found in books and other reading material. While doing this I read a text from Sadie Plant where she introduces Ada Lovelace as a woman with high awareness

² Zeros and Ones by Sadie Plant.

³ EU (15 countries) Science and technology graduates: males 13.0 females 5.5
Tertiary graduates in science and technology per 1000 of male population aged 20-29 years year 2000
source: eurostat

of peripheries, of indices, headings, and prefaces.

I was not aware of being trying to build in a method based in information from individual, personal experiences, comments between people. My idea of how to proceed with my research and how I would be able to come out with a product would have to have “woven” on it, the very process used by lace making women. In other words, in my digital lace making, I wanted to have methods and elements of textile lace making. Personal experiences are very particular. But is it or can it be information, data? Even gossips, an exchange of information mixed with amusement and intrigue, can it be upgraded to a valuable source of information?

A weblog or blog is a way to organise information dynamically and on-line. Most of the time it is a system used to display all sorts of personal information. Here the entries are catalogued by the date they are entered in the system, displayed and archived in the system. Weblogs can be customised meaning you can adapt them to whatever you want. Since what I was intending to make was a personal collection on women and technology and to answer the question I had set about women making lace, a weblog seemed to me the best way to organise my intentions and thoughts.

I looked for a more broadened kind of existing system to organise this “weblog system”. The specific system I used in my research had an important extra feature. It was the use of keywords: I could add keywords to articles, use set of keywords and have an interface only for the keywords. Keywords were important to me since inside databases or collections, they are the elements that make connections, by giving labels to different elements and then looking for the elements that have the same labels, connecting them. Connections made this way, inside a collection of data can be also surprising.

In the begin of my research using a weblog what I was doing were notations. With my weblog I was building some sort of peripheric notation, not to support a specific text, but information to support the knowing of a subject yet to be defined. They were seemingly unconnected small and personal notes about lace, its history, its technique, its implications in the history of women, the culture that surrounds it and ideas of (digital) transformation (hacking). Also, there were notations about women, programming, technologies and borders. These weren't notes containing essential information on the subject, they were just quotes and statements. I once read in a women-only mailing list that between the programmers, the ones that write the help files are the women. Managers seem to believe they are better doing the help files than men. (Sometimes women seem to feel they are asked to write the help files because managers believe they are less good than the guys for doing the coding. Or are men actually even unintentionally, with this kind of ideas, just protecting and reinforcing the male position in a corporation?).

Like these female software developers writing files so other people could use what has been developed, I was trying to put together my own help file to understand what I knew intuitively was a subject I should track. It all felt as a complicated and layered matter.

Subjects, notations and peripheries

“A piece of writing is its own mainstream. Its asides are backwaters which might have

been--- and often are--- compiled by anonymous editors, copyists,... while they may well be providing crucial support for a text which they also connect to other sources, resources, and leads, they are also sidelined and downplayed. (Sadie Plant, *Zeros and Ones*, pg. 9) “

My notations were the path I was setting for myself to create a knowledge about something that had to do with women, lace and (digital) technology. Some feminist's approach to the activity of learning, knowing, is that it is a process you go through and this is the knowledge itself. To “echo- feminists”,⁵ for instance, it is very stressed that the object of knowledge is not a passive one but instead an active agent in the creation (generation?) of knowledge. I wanted to give a chance for this space to “happen” in my research – that this space would be to interact with my research object, instead of engaging in an invasive analysis.

Even when I was positive that it was a temporary situation it was difficult to live with the fact that in my web log I had different subjects which would converge with each other only with some serious effort. They were just very individual and independent chunks of information. Again, my anxiety and feeling of chaos had some alleviation with feminist approaches to mapping, where there is a space opened for serious approaches of knowing from a more limited, “embodied” position (in my case, a knowledge limited by a personal and particular positioning) . “The science question in feminism is about objectivity as positioned rationality. Its images are not the products of escape and transcendence of limits, i.e., the view from above, but the joining of partial views and halting voices into a collective subject position that promises a vision of the means of ongoing finite embodiment, of living within limits and contradictions, i.e., of views from somewhere.”⁶

I knew my web log construction had many limitations and the collection I was making was from a very personal nature. But I was not looking for explanations and intellectual analyses. I was posing a question that would bring me closer to an “intuition”, a texture I had in the back of my mind that was not clear to me but was giving me the parameters to say whether something was usable or not for what I was doing. It was like having a blurred sense of the forest and at the same time making a catalogue of the species that are living there. If I relate it to my lace metaphor I was collecting threads for a lace but also “scanning” for the holes (openings) that would give form to the fabric. What I was looking for was in my own terms probably what Donna Haraway defines as, “We seek not the knowledges ruled by Phallogocentrism (nostalgia for the presence of the One true Word) and disembodied vision, but those ruled by partial sight and limited voice. We do not seek partiality for its own sake, but for the sake of the connections and unexpected openings situated knowledges make possible. Its images are not the products of escape and transcendence of limits, i.e., the view from above, but the joining of partial views and halting voices into a collective subject position that promises a vision of the means of ongoing finite embodiment, of living within limits and contradictions, i.e., of views from somewhere.”

⁵” Ecofeminists have perhaps been most insistent on some version of the world as active subject, not as resource to be mapped and appropriated in bourgeois, Marxist, or masculinist projects.” Donna Haraway in *Situated Knowledges*

⁶ Donna Haraway in *Situated Knowledges*

The idea I had was then to find out, from particular notations, individual experiences, and the unexpected connections they would make, these openings, these possibilities to give form to this lace, called “women and digital technology”.

My vision of multiple was a vision of multiple stitches, multiple women, and multiple meanings. With the help from another feminist who has quite an extreme approach and methods I “followed” this vision. Starhawk’s⁷ approach is a very curious one, she brings the female “issue” into belief systems (and what is the strongest construction of all that is not the construction of religion?). For her there is not a God. If there is there is a Goddess. But as we are not so certain whether this male or female figure exists, there is a multitude of Gods and as a “linked object” there is not a Universe but a “multiverse” or better: “Multiverses”.

Multiple stitches, multitude(s) of women, multiple links and meanings were a perfect fit for me. Because lace makers make laces in groups and because I ended up doing digital work with the help of a woman-only mail list, I decided to inscribe myself in a number of women only mail lists to see whether they could help me find out how to make the “holes”, or the openings situated knowledges allow, what would give the form to my lace. Posing questions inside a network of women was to me an activity of knowing but not knowing alone, by myself. It was a trial to be producing something like lacemakers produce with their laces. I wanted questions and answers to be collective as a result of networked discussions.³⁸ This comes from an awareness that women are very sensitive but also effective in doing things in group and or with a company of activities.

I named my project “cyberlacing” and posted some of the ideas from the notations I was collecting in my readings on women and technologies. I was not exactly interested in a scientific approach about the issues women and technologies raise but mainly in how women dealing with digital technologies experience their activity. Also how they understand what they do and what they report as problems and difficulties.

I enrolled in several ⁹women only mail groups of women dealing with computer, but only 5 or 6 seemed to be open and used intensively. I spent most of my time between them with emails of an group based in America called “Systers”⁴. I still had contact

⁷ “The Twelve Swans” by Starhawk

⁸ This is an idea linked with feminist theories, but also an idea that comes from the history of textile production: women do things in a networked way.

⁹ Here some of the lists I inscribed myself in: ChicasDuras, WEBWOMEN-HTML-REQUEST@NIESTU.COM, LISTSERV@HEARN.BITNET, MAILBASE@MAILBASE.AC.UK, JSTURM@IX.NETCOM.COM, listserv@dawn.hampshire.edu, AFRO-TECHIES-REQUEST@PERSEPHONE.HAMPSHIRE.EDU, CYBORG-L@LIST.WIGSAT.ORG, MAC-WOMEN-REQUEST@LISTS1.BEST.COM, systems+forensicsumm@athena.systems.org; systems+professional@athena.systems.org; systems+conversation@athena.systems.org, systems+interesting2@athena.systems.org, teachers@lists.genderchangers.org, denkenk@womenonthewe b.nl, systems+sexism@athena.systems.org, gca@lists.genderchangers.org, INET-GRRLS-REQUEST@USERS.LINK-NET.COM, LYRIS@LYRIS.ISOC.ORG, MAJORDOMO@IGC.APC.ORG, MAJORDOMO@SWEETHOMES.COM, MAJORDOMO@SOUTHWIND.NET, mailbase-admin@mailbase.org.uk,

⁴ www.systers.org. The Systers email list was created by Anita Borg in 1987 for technical women in computing. Nowadays an informal organization for technical women in computing that began in 1987 as a small mailing list for women in "systems", thus the name systers. There are now over 2500 systers in 25 countries.

with the Dutch women-only network “women on the web .nl”, which is very wide and requires no knowledge or skills in advance to join. Although all the groups don’t ask specifically skills or special knowledge, I had the idea that some were made for their specific network of women. In the women on the web .nl network I tried to follow their mail-meetings about the organisation that were mostly about how to get more women in the list and how to further their intentions.

Some other groups like Gender Changers were more focused on their activities outside the web to give much attention to my email questions but now and then they would give some comments on my questions. I was very interested in information that would lead me to some answer or clue to questions like, "Do we women really think and act differently than men? And if so, could I relate to it and identify myself with it?" There was one thing I did know and this was confirmed during this project in interviews I have had with two women who moderate both mixed and women only email lists. There's a big difference between these two kinds of lists. In women only lists information is presented with some amount of emotional reassurance. Women usually don't just tell each other only how to put a pc together; they also tell that it is o.k. to do so, that for instance, the computer won't brake, explode or something weird will happen. To follow up with the textile metaphor I used to start my project, it is like the way my grandmother (a very experienced needleworker) used to teach me how to do needlework; information but mixed with reassurance embedded on jokes, stories, examples, etc.

Some of the opinions about gender differences converged in the different groups. Ideas like “women tend to pay more attention to usability, navigation and interface and men to cool things that you can do with code.” Some of the ideas that were discussed in the mail lists about code had been gendered, like by the Sisters network:

1. “Is probably a big sexist statement, but I'd like your opinions on it. I've worked with both female colleagues” code and male colleague's code. I've found the women's code easier to understand and maintain. Another guy has said the same thing to me. It seems to me that sometimes guys incorporate "cool" features into their coding or shortcuts. It then makes it harder to understand for someone else. I'm much for the KISS method. However, once in a while I'll see some elegant code from men.”

2. “as for coding, I think that coding is the equivalent of "creative" writing. this is my personal opinion. Coding is an expression of creativity. From what you code, you get your result, a program. For guys, what I see is best described as "chicken scratch", an advancement from bad handwriting on paper to the digital code in a text file :) the problems are understanding code and figuring out the logic. in the rush to create a program, they try to make their code difficult to understand by using macros, short-forms, short variables, the usual spelling mistakes, bugs, and so on. My observation is they write a lot of code, forget the help file (help? what help?), focus on the non-usable parts (like having a nice screen that has no meaningful function). They like to brag about their code, and the cowboy way of doing things. Another problem is the code is haphazard, and thought-unfriendly. Then, guys are blind to their own mistakes, and need someone else to test their programs. When it comes to finger pointing, they are quick to blame woman (who else?) for the bad code :-p

For woman, the coding is more thought conscious of the user (vs. some fancy code)

and easier to understand. I have noticed that common sense and understanding that the user may not be well versed with computers. Other than my own code, I have not seen detailed examples of coding from woman programmers.

3."I agree. Most of the users I deal with at my institution are women and until recently, most of the programmers have been male. They have done some very "cool" things in our software, but there are other, smaller, less exciting things that would be more useful. Now that there are mostly women programmers, they understand this and are working to help the users do their jobs more efficiently.

I think this is not so much a function of the language itself as it is a function of the programmer using the language. I'm over-generalizing a little bit here, but I find that female programmers are more likely to try to identify with the user and write code that is "user centred", i.e., it gives the user the functionality they need without the user having to jump through hoops to use it. Many (but by no means all) of the male programmers I've worked with tend to focus on the "gee-whiz", technically advanced, complex functionality that may or may not actually be usable by a technically unsophisticated user.

Think about this, a lot of the software that's being produced is for use by your average minimum wage or temporary employee. I'd get in trouble for it, but in my last job I characterized our "average" user as a middle-aged woman who's afraid of her computer. That was the skill-set that I kept in mind as I designed or modified the GUI for the program I was working on. I think guys in general have a harder time focusing on the "who" rather than the "how".

4." I'm not sure that this is just a male thing. Some programmers are just clueless about user interfaces. It's a matter of focus, algorithms, user interface, and data base design. Programmers do what they know best. I'm really bad at designing user interfaces (UI). I know a good one when I see and use it, but I'm really clueless about how to do it, myself. I'm a firm believer that you should use specialists in UI design. I think that this has been discussed before. But there is an element here that has nothing to do with programming. You also need to know how the user, uses the information. What is their work flow, how do they do their job. You don't want to be too intrusive and force them to do their work in an awkward way. I can see the work flow, but the actual interface just doesn't come naturally to me. I know that my original CS education didn't include UI design, although I took a class later. It helped, and made me more aware of bad design, but didn't make me a good UI designer."

5. "It isn't just programmers (or maybe it is the programmer mentality...) who want to do cool things just because the cool things are there. We have a (male) DBA who really likes to implement new features. I get so frustrated when I hear the phrase --- look at what I can do, it is less efficient and doesn't work in a lot of situations, but in the three cases where it does work, it is REALLY cool --- Great, we sacrifice efficiency and utility for cool new toy... I keep thinking maybe I am missing something. I guess, maybe I'm not."

6."I've been training end users on my company's software system for about 8 years now. What I have noticed is that computer programs (particularly ours) have logic, a logic, and the trick isn't to learn to be logical but to learn the system's logic. If you put twenty people in a room and ask them to figure out a problem, they may all get to the

same answer but they won't have the same solution unless they have been trained to solve problems the same way. That's the thing. Yes, code is gendered in the sense that it was written by human beings and those that are going to code have to learn the correct forms for it, just like math. If you're asking whether women manage code differently from men, I think you would have to study CS students who are writing new languages, not just coding in an existing one. Another analogy is grammar. If you've grown up in a society and learned the grammatical forms, it doesn't matter if you're male or female using it, because you have years (or centuries) of the Patriarchal society shaping grammar. It's so ingrained that you always notice that it's gendered, unless you're learning a new language for the first time. Some of the French feminists have written some very interesting things on grammar, which might have some relevance to your thesis.”

7. “No, I don't think code overall is gendered. There are cases where a program's interface or function might be considered more male or female (I have no examples). But overall code, by itself, is not male or female. That's one of its positive attributes.

Even though I was wiser with this information which is also confirmed by the Gender Gaps: Where Schools Still Fail Our Children⁵ relating on how to make girls more interested in studying programming (women find kill games boring, the nerd lifestyle hardly attractive, the machine uninteresting until it shows that it is of some use for them) I knew there was more out there.”

The AAUW (American Association of University Women) reports, "The cultural emphasis on technical capacity, speed, and efficiency when discussing computers estranges a broad array of learners, many girls included, who do not identify with the wizardry of computer aficionados and have little interest in the purely technical aspects of the machines (2000, p. 7)."

Sherry Turkle, co-chair of the AAUW's Commission on Technology, Gender, and Teacher Education, insists that girls are not "computer-phobic." Instead, because of this pervasive thinking about what is important in a technology culture, they are actually just "computer-reticent." Girls tend to see computers as tools, whereas they believe boys use them as toys, substituting computer skills for social skills. Girls' reluctance stems from an unwillingness to make that trade (AAUW, 2000, p. 7-9).

In response to these concerns and the need for informed recommendations on how to address them, the Commission on Technology, Gender, and Teacher Education ultimately endorsed the following mutually supportive and beneficial goals:

Draw more women and girls into computer science and related technical fields. This includes encouraging their participation in the appropriate courses to get there.

Make women and girls more comfortable in the culture of technology, emphasizing relationships with technology regardless of eventual occupational, social, or family goals (AAUW, 2000, p. 4).

⁵ http://www.aauw.org/research/girls_education/gg.cfm

My intuition said there was something I was missing. Why are women seemingly not interested in “computer's speed, how technology works, or programming”⁶

I can understand that the culture and image around computer is not a feminine one and that what it communicates to women makes them feel they don't have something to do with it. But somehow I am not totally convinced that if you change the image of computer it makes women feel closer to the machine.

I made two ways to “tour” or browse the weblog I had and send to an even larger amount of women's lists asking them to “cyberlace” the subject.

This was an action that became clear as responses (not many) started to come. An image of computer code named “the bride”, a question “shall I link you to my site?” another photograph of a women in between textile and computer activity, a photo of a textile - computer hardware hybrid and a song about the origins of lace.

This to me was a more satisfying response to the questions I was posing, even though it seemed limited, chaotic, random and unclear as information. There were other elements in the files I got “cyberlaced”. There was some sense of generosity, of wanting to share, or of transforming what I have sent.

From feminism and fiction

“Data structures and algorithms drive different forms of computer culture. CD-ROMs, Web sites and other new media objects which are organized as databases correspond to the data structure; while narratives, including computer games, correspond to the algorithms.” Database as a Genre of New Media- Lev Manovich

Yes, I can agree that images selected randomly from inside an structured database do not tell a story. What can happen when images from a collection of selected randomly are not just “random images”? This was for me a crucial question in my project while I was trying to link laces with technology with women.

It was very clear that women have every thing to do with computers, the internet, nets, code, stitches. You have the digital precision, fast action with the fingers used by typing, you have the attention to details: the capacity to work on one little detail, very particular and specific, while maintaining the “big picture” on front.. You have the possibility of textile to carry information not only in its decoration (motif) but embedded in the characteristics of it's stitches. You have women's talents in calculation, their communicating nature and hours spent on telephones.

It was less clear to me if I could see parallels to the generating capacities of women (that is what our bodies do) and the activity of programming. To be truth to my metaphor, I had to see a piece of lace (database of hybrid stitches-data) generating meaning. Lace was used to tell stories; it uses visual elements – motifs. There also

⁶ “According to the *Tech Savvy* report, girls in general have little interest in a computer's speed, how technology works, or programming. They're less interested in the machine for the machine's sake than they are in advancing things that they're already interested in--solving problems, communicating with their friends, finding information.” <http://www.nea.org/neatoday/0011/scoop.html>

lace made to represent historical facts, in the fashion of an illustration. I sensed that somehow the collection of stitches organised in a certain way could have also its own narrative, but I wanted to think “higher”: can a database make a narrative where its structure tells the story, like stories are embedded in the textile?

“Because there is no difference between the process of weaving and the woven desing, cloths persist as records of the processes that fed into their production”.
Lace can be described as a textile that is built from threads as much as from holes.
Are the threads the ones from lace (presence) and the holes zero’s (absence)?

Sadie Plant, in her book *Zeros and Ones*, talks about the zero as the foreign digit considered by the Catholic Church until the Renaissance as subversive: “ The numbers 1,2,3,4,5,6,7,8,9 were subversive enough, but zero was unthinkable. If it wasn’t one of something, it couldn’t be allowed. Then again, the Church could hardly be seen to protest too much about something that, as far as they could see, wasn’t really there at all.” Zero, the sign of absence, nonbeing and nothing.”(pg54 *Zeros and Ones*). This absence, or the 0 is, in the punch cards from early binary machines, the blank space, while the hole is one. The digit of the idea of zero are not simply an absence of something positive. “For the quantum physicist, the holes are not absence of particules but particules traveling faster than the speed of light” SP pg57

If laces are at the same time threads and holes, and threads would be material, holes would be then another material instead of absence of threads. What would be then this matter: the holes from my cyberlace?

Can a story tells itself (emerge) when a specific collection of information is presented?

Researching lace was for me also an attempt to follow my “intuition” that there are narratives and stories to be told using a different system that is not the chronological order imposed by the one that tells the story – the narrator. My intuition wanted the narrative that is embedded in lace and that has to do with women and technology.

The intent of having a database of information was to be able to find a way to tell a story and to make connections that are layered and multiple. Because there are many interfaces to the same story, I put the lace in the background and looked at the technology to get to the women. I had to switch from the lace as data structure to the fiction to get to the women (that generates). Can a story tell itself (emerge) when a specific collection of information is presented?

My “quest” is not over even though I feel happy with the choice of a database system that represents the multiple. In the many to many database a texture of relations can be made where the one do not belong only to the other and the other not only to the one. There are multiple relations to be made. To cite MMurtogh, my teacher of computer programming, "Just like modern love". There are stories that can generate themselves from the inside of multiple relations. This system looked enough like lace with its patterns of multiple stitches linked to one another or several others in several diverse fashions, angles, sizes.

The idea of lace being a collection of multiple and diverse stitches and my wish to

read its story made me remember a teaching method I followed to learn French. The teacher was a French translator of cuneiform writings (signs from the old Mesopotamia where the signs are represented by drawings) that believed people could read texts and even learn a language by simply contextualising the elements. The idea was that when you scan an incomprehensible list or database of words your eyes would automatically fix on the elements that would be the most recognisable in the text. Then you would scan the surroundings from this element to contextualise it. Even when you are not totally aware of the exact meaning of one or more words in the text you would supposedly be able to actually understand the text you were reading because you would be constantly contextualising words.

This method is somewhat in the direction I was looking for when wishing to “read” laces. In the learning system of the French teacher, the context of the word made you understand the meaning of the text. There is something to visual information that is more synthetic as opposed to analytical. There are several kinds of information given at one glance; a photo of a tree in a park gives you immediately a package of information about the weather, the kind of tree, the health of the tree, the distance from one tree to another, the height, etc.

Nonanalytical approach to read information has been used in systems to catch more feminine thought, like the system for the group at <http://www.stitch-and-split.org/> Here a database is filled with less “black and white” definitions, and more “shades of grey”. Another initiative is the Web of Trails where the idea is to make an associative system.⁷

These two systems are contextualising information and letting its meaning be relative to the context. With the concept of Situated Knowledges, Donna Haraway describes this form of looking at creation of knowledge. Truth cannot be described because knowing is a snapshot that freezes reality in its ever changing movement and processes. When you make transparent from which position you are knowing, and do not assume you are knowing “the truth”, there is more chance to some objectivity.

When information is contextualised and one knows from where they are “talking from”, there is space open not only for objectivity, (Haraway) but also for creation, for “action”: “Feminist objectivity makes room for surprises and ironies at the heart of all knowledge production; we are not in charge of the world. We just live here and try to strike up non-innocent conversations by means of our prosthetic devices, including

⁷ Web of Trails : The real heart of the matter of selection, however, goes deeper than a lag in the adoption of mechanisms by libraries, or a lack of development of devices for their use. Our ineptitude in getting at the record is largely caused by the artificiality of systems of indexing. When data of any sort are placed in storage, they are filed alphabetically or numerically, and information is found (when it is) by tracing it down from subclass to subclass. It can be in only one place, unless duplicates are used; one has to have rules as to which path will locate it, and the rules are cumbersome. Having found one item, moreover, one has to emerge from the system and re-enter on a new path.

The human mind does not work that way. It operates by association. With one item in its grasp, it snaps instantly to the next that is suggested by the association of thoughts, in accordance with some intricate web of trails carried by the cells of the brain. It has other characteristics, of course; trails that are not frequently followed are prone to fade, items are not fully permanent, memory is transitory. Yet the speed of action, the intricacy of trails, the detail of mental pictures, is awe-inspiring beyond all else in nature. http://www.constantvzw.com/web_of_trails/

our visualization technologies. No wonder science fiction has been such a rich writing practice in recent feminist theory. I like to see feminist theory as a reinvented coyote discourse obligated to its enabling sources in many kinds of heterogeneous accounts of the world”¹

Sadie Plant, in her book *Zeros and Ones* pointed out that “weaving was already multimedia: singing, chanting, telling stories, dancing and playing games as they work, spinsters, weavers, and needle worker were literally net workers as well. It seems that “the women of prehistoric Europe gathered at one another's houses to spin, sew, weave and have fellowship.” Spinning yarns, fabricating fictions, fashioning fashions... the textures of woven cloth functioned as means of communication and information storage”.

Lace maker's product was envolt in songs and tales to sing and tell while working. Maybe the hole of my lace is this transformative element that creation had. Lace maker's product was involved in songs and tales to be sung and told while working. Songs made the work easier, tales told about people whom the workers could look up to, and the lace makers were able to dream of far away things and wishes. These formats were good for teaching each other what to do, why, and how to behave in life as well as a sense of bonding with the group. Multimedia was the glue to their activity as well as a wealth of information.

No matter what perspective I look at laces, I think on multiplicities⁸ and what I see are multitudes and multimedia strategies. I am particularly interested in the connection between fiction and feminism, about connections you can make and stories you can tell that can be empowering; connections that can take you out of one understanding of the world that doesn't give answers or solutions and enable you to create another environment where you feel more comfortable to act . To ability to change the environment or feeling about something you have by using information in another way than the information being purely data.

Fiction gives the freedom to think and to deal with information in such a way that information gets communicated in concentrated form and layering of information is easier understood. Like the women only mailists give information involving reassurance, fiction communicates all sorts of information together.

In an interview with Laurence Rassel From Constance, I asked the feminist to say something about this connection between fiction and feminism. Her idea is that since feminism does not have a history, fiction is another way of creating models of women

¹ Donna Harraway's “Situated Knowledge”

⁸ All multiplicities are flat, in the sense that they fill or occupy all of their dimensions... Multiplicities are defined by the outside: by the abstract line, the line of flight or deterritorialization according to which they change in nature and connect with other multiplicities. The plane of consistency (grid) is the outside of all multiplicities. The line of flight marks: the reality of a finite number of dimensions that the multiplicity effectively fills; the impossibility of a supplementary dimension, unless the multiplicity is transformed by the line of flight; the possibility and necessity of flattening all of the multiplicities on a single plane of consistency or exteriority, regardless of their number of dimensions. The ideal for a book would be to lay everything out on a plane of exteriority of this kind, on a single page, the same sheet: lived events, historical determinations, concepts, individuals, groups, social formations. quote from Deleuze & Guattari in *A Thousand Plateaus: Capitalism and Schizophrenia*

also: After deconstruction we can see that it is not the will of the puppeteer that controls the actions of the puppet, it is a "multiplicity of nerve fibers."

and identities one can look up to.

I had to think about these things when I saw the site: Guide to Geek Girls.⁹ The Geek Girl and the Lace Girl¹⁰ are from entirely different worlds of course, but both are actually telling the same thing: “here is a woman that does things that is worth while, and she is someone you might want to imitate”. Both are fiction to look up to.

In her book *Zeros and Ones*, Sadie Plant describes the character of Ada Lovelace as a woman that communicates and actually Sadie Plant build on this idea that women do have something very essential to do with technologies and that yes, women have a very different approach to it, but as worth while as man's approach.. Womens approach is one that is an enrichment to the issue rather than something that has to remain in the peripheries of knowledge. Fiction here is a strategy and one that can take you much farther.

“Cyber feminists are an enrichment in the critic of modern urban societies exactly due to their iconoclastic reading of the contemporary crisis. Feminist cultural and media activists such as the riot girls and other 'cyber feminists' are devoted to the politics of parody or parodic repetition. Some of these creative minds are "prone to theory" and other feminist science fiction writers and other 'fabulators' like Angela Carter choose the fictional mode. While irony remains a major stylistic device contemporary multimedia electronic artists of the non-nostalgic kind like Jenny Holzer, Laurie Anderson and Cindy Sherman are also of great significance. They are the ideal travel companions in postmodernity.¹¹”

The World Wide Web and the Internet is seen by Sadie Plant as well as by some other feminists as essentially a female place where the female discourse will be increasingly more present. That is all going to happen in a natural way due to this intimacy that women have with the structure of the Internet, www, communication strategies,

⁹ <http://www.obn.org/guide/>

¹⁰The “Lace Girl” is a tale from Brugge – a city in Belgium that has had a lace making industry. The tale talks about the origins of lace making. With her widowed mother, Serena made spin to support her many brothers and sisters. When her mother fell ill and was unable to work it became a heavy burden for the girl. Serena prayed to the holy mother begging for a wonder.

She promised to give up what she loved the most, her husband to be Arnout. While walking one day, Serena stopped under a tree when suddenly threads of a web fell on her black dress. Fascinated by the elegance of the drawings Serena took the threads home and tried to reproduce them with the threads she had spun. She fixed the threads with pins in a cushion and tightened them Underneath pieces of wood. With much effort she managed to make a wonderful piece of cloth. She improved the technique and taught it to her sisters. Soon, wealthy ladies heard about this cloth and Serena and the sisters had many clients. This is how the family managed to attain some wealth.

However when Arnout came to ask her to marry him she could not say yes as she had promised this to the holy mother. Serena felt the heavy weight of the sadness. To celebrate the wonder she had received from the holy mother Serena went every year to sit under the tree that had inspired her. This time a web fell on her dress that had the form of a wedding gown. Serena understood that she was free from her promise to not marry her beloved. They finally married and had several children; all girls who could help spread the knowledge of lacemaking.
¹¹Rosi Braidotti in “Cyberfeminism with a difference”

networking and so on. I hope they are right.

Conclusion

Feminism and feminist ideas still need their boom. With reason, the feminist Laurence Rassel told in an interview that she changed her approach to feminism when she got tired of the idea that having feminist ideas or calling yourself a feminist would be linked only with social issues like violence against women or lesbian issues. Of course these are important issues, but feminism can also be more simple and general, just like the fact of being a woman.

Since we live in a world where values of compassion, for instance, have almost no significance, talking exclusively about domestic violence scares people away that do not share this experience. Women being victimised is a boring subject.

When feminism is still seen as “against men” or “about lesbians” the response from the public is that women are not so much better than man as if it is a question of simple competition between two parts. General public doesn’t want to be confronted with the fact that women are still discriminated against because they are women. Nobody wants to hear negative news. Feminism is a concept that is still difficult to swallow.

Feminism should be a public discussion. That is why I adored when I would see Janeway from the Voyager making important decisions based simply on her intuition, or the images of her very feminine technical crew pursuing differences in the Galaxy.

The strategies to connect technology with domestic elements like the sewing machine and cooking, what I really think is nice and effective, find difficulties when women want to be seen “seriously” by their clients or bosses.

I see the need to an upgrading of domestic values at the same time as the use of it to empower women, because the idea of being connected with the very domestic idea of cloth making can be sometimes problematic since women still have to be twice as efficient as man in what they do and 5 times as efficient as men when the issue is technology.

If there’s something I learned in mail lists is that discrimination against women in the computer world is as alive and rampant. There is still the idea that you as a women have to fight with the same weapons of men. It is sad that discrimination is still so alive and kicking. At the same time, upgrading domestic elements also create more life caring values. Having babies is still a weird hobby and something you better not do when you’re pursuing a career, while I once heard that investing in man was to invest in the construction of bridges and in females was investing in education.

It will be nice when feminism will be known by the big public (the masses they can change things also!) as being something about other values (without losing the avant-garde thoughts) like what Braidotti writes about: The most effective strategy remains for women to use technology in order to disengage our collective imagination from the phallus and its accessory values: money, exclusion and domination, nationalism,

iconic femininity and systematic violence.

In a moment in time when Captain Janeway is put off of the television and the Dutch Government declares that “emancipation is completed”, humour and imagination seem to be the key to building up different images of powerfully women.

To cyberlace is to transform ideas about women and technology. This is borrowed from the transformation of thread in the textile lace: made of multiple tiny stitches. These are stitches built by a group of women. A network. It tells a story: the story is embedded in the way the lace is produced, not only in what it shows as themes or motifs. Above all, cyberlace is a fiction that wants to tell that women – yes – are different than man and if women seems complicate or uncomprehensible to men, it is just that its is made from another matter that is not an absence. That the feminine approach is an approach that is able to transform and to bring the world other values. Cyberlace means lots of tiny stitches building this same story, about women been not a hole or an absence. And that the world does not have only one truth – man’s truth.