

Digital Textile Tools: Salvation or Ahrimanic¹ Seduction?

“Do you want your washing machine [or loom] to be smarter than you?”
(Lem Stanislaw, *The Washing Machine Tragedy*, 1971²)

Digital media opens a whole world of opportunities for doing things as perfectly and complexly as we were never able to do before. We can now rid our work of all the little faults that may happen when doing something by hand. We can do so much more in so much less time. We can access machines that were restricted before to modes of mass production and we can do away with big editions to recoup set-up costs. But this brave new world has its drawbacks as well and creates a range of problems we did not have to cope with before. Some of these problems concern the issue of ‘control’ in various ways. Firstly, we need to acknowledge that we spend much time in learning specialist software and that we are, in a sense, controlled through this necessity. Secondly, the quality and complexity of software programmes differ vastly and if they do not enable us to use the full potential of the tool we lose some freedom and control with regard to our work. Thirdly, the equipment on the digital- as well as the machine-level is very expensive. Not everyone can afford to buy their own production tools. While in principle technical development opens new processes to more people, in practice, decision-makers (such as directors of research centres) concerning those machines choose for us who has access or who does not. Fourthly, it is also expensive to run the machines and sometimes technician costs have to be covered as well. Lastly, the current complex tools often replace processes that we used to do by hand or with simple machines we could control in a more immediate sense. Thus, when engaging with this new interface between us and the result we also lose some direct influence on the output. We are as a result in danger of physically losing touch with our own work. It would not be quite accurate to say that we are becoming alienated from our work as happened to wage-earners in the old factory system critiqued by Marxist theorists³, but rather that we are in some ways voluntarily alienating ourselves from our work through the tools we choose to use.

In my field of expertise – textiles – digital versions of traditional machines have become increasingly accessible. Examples are computer controlled dobby- and Jacquard looms, textile printers, embroidery- and knitting machines, to name just a few. As a trained weaver and textile designer for industry I've always been interested in the process involved while creating work. Being exposed to many different materials and techniques over a period of time challenged me to push the boundaries of the application processes of those techniques. As an artist I am also interested in the socio-political consequences of the developments of machines, while indulging in their complex processes for making my own artwork.

Before I tell my reader more about my own work I need to explain some aspects of weaving as a practice. As most will know this practice is based on the crossing of two thread systems, the warp and the weft. Whether these threads are lifted or lowered at their intersections determines the structure of any woven fabric. The Jacquard loom was invented in France by Joseph-Marie Jacquard in 1804. Working with punch cards to regulate every thread individually, this loom was one of the first programmable machines (which later led to the development of computers). The punch card control allowed for images to be woven, but the production of a punch card was time-consuming and expensive as it was a specialist skill. Owning such cards was a financial and creative asset. The manufacturer – or at least the area where a fabric was made – could sometimes be recognised by the pattern of the fabric. Nowadays, the Jacquard power-looms are a common tool for mass production in industry. Computer software that allows assigning weave structures to the design has now been written. The card system was replaced by computer 'loom control'. While one still has to spend some time to make the design legible to the loom, the time/result ratio is more advantageous. This means that it is now possible to create files for the weaving of just one piece. Therefore, not only power-looms but also hand-looms became equipped with Jacquard heads⁴ like the ones used in industry. This technical development opened the weaving process to a whole new circle of creators. Visual artists and craftspeople are now able to use the complex technology for the individual expression of artistic ideas and to make objects in a small or limited edition. Designers are also able to create prototypes of their designs.

I will now tell my reader the story of how one of my Jacquard-woven works was supposed to be made. The process became far more difficult than expected and problems arose that were beyond my control. While I am aware that weaving is a specialised field, maybe not relevant to many, these experiences of mine can be seen as an example of what is going on in many disciplines and even in a broader sense in many parts of our lives in general. When showing my work, I am often asked "How long did it take you to make this?" and the answer is not an easy one. In telling the following story I would like to explain why this is so. While the act of weaving often takes only one or a few days, other controlling factors have to be taken into consideration.

I had a plan! In 2004 I developed a technique with which, through the use of retro-reflective yarn, one can weave two images onto one panel of fabric. The first image is then visible in normal light and the other one is concealed until frontally illuminated by the viewer holding a light. I wanted to weave this fantastic piece which would show a pristine New Zealand beach with its waves and birdlife. In a different light it would

show the industrial riverbank of the Hamburg harbour with its container cranes and concrete walls. It would be complicated but possible as I know my way around weave structures and materials. The format would be one by four metres showing my hometown and my present place of residence. This would reflect my confusion and feeling of displacement and the big contrast of the two environments that shape my experiences.



Figure 1: Photograph of a beach on the Otago Peninsula near Dunedin in New Zealand, partly covered with the weaving sample described in this article (dimensions of the finished piece approx. 1 x 4 metres).

'All' I needed was access to one of those fancy computer-aided hand-Jacquard looms. These are rare and artists travel far to use them as they cost a couple of hundred thousand dollars to set up. Having lived in Montreal at times since 1994, I had occasional access to such a loom since 1996. Fortune smiled on me when the Royal Melbourne Institute of Technology in Melbourne got one for themselves exactly in the month I relocated from Canada to New Zealand. This was practically around the corner from my new home! The world of textile makers is an internationally well-connected one. I revived an already existing contact with a lecturer from RMIT, offered collaboration and was granted access to the splendid tool. In August 2006 I went on a 10-day trip to weave my new piece.



Figure 2: Computer controlled hand-Jacquard-loom at RMIT in Melbourne during my weaving project.

The thing I was nervous about was that the software used in Melbourne was one I did not understand yet. So the first step was to meet their technician and learn how the software was working. Then I would be able to prepare my images in the appropriate way. As feared, the software was not constructing files in the way I was used to. So I thought about a couple of other ways to do this but neither worked. Consultation with one graphic software lecturer and two from the textile department did not produce the desired result either. There were five specialists working on prime equipment on the problem and we were unable to solve it. Gaining insight into the 'Scotch Weave' system, I started to understand that this software was created for the needs of industry. It could calculate structures which made sense for mass production on power looms within a certain price range but could not use the loom to its full potential outside that equation. Artists, who often stretch technical boundaries, are not the target group for these software developers. Someone typically designing a fabric on this kind of software (for industry) has to learn about and to adapt to the way of thinking that is used in the program and then design within those parameters. This is not a creatively open process. After three different attempts to create my weaving file, we all agreed that this system was not capable of calculating what I needed it to.

Fortunately technology has some other convenient tools for us and so I used the possibilities of communication and emailed my problem to my friend Louise Lémieux Bérubé. As the director of the Montreal Centre for Contemporary Textiles she had the desired Pointcarré software which we could not access anywhere in Victoria at that moment. She helped me to create the weaving files which took about three days and nights of emailing frantically back and forth at any time of the day or night. There are fourteen hours time difference between Montreal and Melbourne and so whenever I was writing something in the morning it was night in Canada and vice versa. Every small mistake or question on either side would delay the process by a day, but we persevered and finally I was ready to start weaving. The file was not exactly what I wanted but it was my only chance of getting at least some kind of result. Even though I was given after-hours access at RMIT I had run out of time for proper experimentation. The experience gained in those ten days was valuable but the outcome was not satisfactory to be shown as an art piece. I had not had the time to try out proportions, yarns and colours and then to adjust the file according to my final choice. More than once during that week I had the feeling I should just weave a piece of plain-weave fabric instead, which could have been done on the simplest of looms and would have provided better results and satisfaction for me. I asked myself repeatedly why we are so easily tempted by something that is more complex and technically challenging. Just because it is new and 'cool'? - I realised that I had gone far beyond the point where I was still in control of what I was doing as an artist.

Back in Dunedin I reflected on what had happened: Some of the tools we have today have become very complex, and the financial investment in order to use them is enormous. The frustration factor is also huge. Still, I remained interested in overcoming those hurdles and making the piece. I decided to find more time, to finance another trip (this time for two weeks) and buy my own software at a price equivalent to that of a good second-hand car. A date was set for three months later and I was excited about having another opportunity. My still thriving enthusiasm was, however, subdued when I was told there were problems with the loom and it was unclear how long these would take to become resolved. As I had bought the ticket and for lack of a better date to travel, I decided to take the risk of going anyway. I had the file ready to weave only to find the wrong warp colour on the loom in Melbourne.

There the decision had been made to change this warp only after fixing the loom. To make a long story short: after three days and several emails and phone calls – with me standing on top of the loom with a cell phone connection to France and receiving instructions from the manufacturer in German to press certain buttons – the problem was diagnosed to be neither electronic nor pneumatic but merely mechanical and easy to fix after all. So we got ready to change the threads to white.

Finally, I aimed for the mouse click to convert my file from the visible graphic to the loom-legible version. I could not find the right file format in my catalogue and emailed the Pointcarré agent (also in France) about the problem. He answered one day later from Korea that he was working elsewhere and I should contact headquarters directly. After having lost another day to ‘time zoning’ I talked on the Tuesday night to another agent in France. She assured me that I was correct in not being able to convert the file as the software key they had sent me was not capable of communicating with ANY LOOM! After some discussion they agreed to send a new version by courier and thanks (again) to technology I could follow all its plane trips online and this kept me busy as I could do nothing else. I could even see that they attempted delivery within the school yet in the wrong room on Friday morning only to take the parcel back to the depot. When I finally had the right USB-key I was ready to quit weaving forever, to attempt to give back the software and maybe to knit socks instead to fulfil my creative cravings as my fortnight had dwindled to allow me only the rest of that Friday afternoon and the whole of the following Monday on the loom. This was not enough time to weave the piece.

In my travel diary I continued to write on November 30th:

The whole piece is becoming so expensive that in the meantime there is no real justification for it but the learning curve. Is it worth it? Why not simply take some paint or some threads and a few brushes or needles and do it that way? The process of the making has become a drama which in itself becomes a kind of performance. What can I weave in this single day that makes sense?

I eventually wove about one metre of the New Zealand beach (no time for the Hamburg cranes yet) and had at least a physical sample to bring home with me. I have not started knitting socks yet and am still hoping for my Jacquard panels to eventuate. I am still dreaming of arranging yet more time and money to go to Melbourne again and to be 'third time lucky'. However, the experience made me think a lot about technology and the helpless state we can find ourselves in when we are relying on it. I might now even consider moving my practice away from digital techniques, but that is not decided yet. The reasons for the failure of my project so far were beyond my control. I am aware that in every art practice one does not have control over all the factors. However, in using digital media we increase the number of steps to be completed and those steps can be quite complex. For example, if a thread breaks I can make a knot. But, if the software signals to me that it cannot calculate something I am stuck. In using new technology today we are also removing ourselves from some of the direct contact with our materials. In many cases common sense does not help us any longer. This is true with regard to much of technology available to the artist today and I am concerned about this development.

Another point is that we tend to forget that using the computer cannot replace specialist knowledge. I remember a colleague telling me of the example of an American manufacturer having problems with a fabric. The textile they were producing was buckling. They asked their German sister-company for help. The mistake the designer had made was a very basic one. One would usually learn to recognise it in a first-year weaving class. But, in the whole American company no one had observed the reason for the problem. The person seeing it in Germany was a draft-maker for Jacquard looms. Traditionally those workers would draw the technical chart thread by thread as the 'draft', from which they would then create the punch card, in earlier days by hand and later by machine. While this was very time-consuming, there was a specialist in charge of the weave structure. Today, the interpretation of the data is done by the software which is convenient but leaves the control to the machine. As it is convenient to let someone else – or rather something else – do the work for us, I predict we will pay less and less attention to a step such as how to assign the structures to the loom. The physical knowledge of doing this thread by thread and understanding the whole process could be lost. While it is indisputably positive that the existing software allows non-specialists to achieve results that surely add to the ideas within the discipline of textile making, it is also true that more and more people using the machines lack a real understanding of the nature and possibilities of fabric as a material for creative work. I would argue that this could potentially be dangerous in the long term. The moment something goes wrong we need to understand what is happening in order to solve the problem. I am concerned that if we do not cherish traditional skills enough, our specialists will over time be replaced by partly informed laypeople who are dependent on operative machines while crucial knowledge will be lost.

I have been and am still as critical about digital media as I am fascinated by them. My decision to train in the realm of new technologies and new materials in spite of my apprehension was a deliberate one as I wanted to be able to contribute to the discussion and evaluation of risk or benefit in an informed way. However, my involvement with the digital has not relieved but rather confirmed my concerns. I am not sure that the 'whole world of opportunities' I was

mentioning in the beginning of this article is adding to our quality of life. I am certain though that they do not increase our level of personal control over our work, even if we wish that they might do so.

- 1 Ahriman is a 'dark force' or 'Master of Death' as described in the Anthroposophical philosophy of Rudolf Steiner. Ahriman is the diabolic force acting alongside Lucifer. "*Management of the Computer* - What has been said does not mean, however, that one should therefore refrain from using a computer or the Internet. They belong to our civilisation and at the same time the greatest ahrimanic provocations which mankind faces and will have to face increasingly in the future. Crucial is however, as with many similar problems, which we are faced with in today's civilisation, whether man controls the computer and the internet or they man... If man wants to maintain his autonomy over the world of the computer then he has to differentiate between what objectively offers pure technical aid for his work and where he oversteps the mark behind which, at first unnoticeable, the ahrimanic seduction begins to take control. In the latter case man increasingly starts, without being aware of it, to become an instrument for alien purposes so that he slowly slides into the sub nature himself". Sergei Prokofieff, "The Being of the Internet", *Pacifica Journal* (29), Anthroposophical Society Hawaii, 2006 (1), 4-5 as at www.waldorflibrary.org/Journal_Articles/PacificJ29.pdf, as last accessed on 2 April 2007.
- 2 Stanislaw Lem, *Memoirs of a Space Traveller*, translated from the Polish by Joel Stern & Maria Swiecicka-Ziemianek (London: Mandarin, 1971/1991), 89.
- 3 See Ted Honderich (ed.), *The Oxford Companion to Philosophy* (Oxford & New York: Oxford University Press, 1995), 22.
- 4 These are the Jacquard machines on top of the looms.

Photographs by the artist.

Christine Keller is German-born and currently the Head of Textiles at Otago Polytechnic School of Art in Dunedin, New Zealand. Her work is positioned between traditional textile design and weaving and new media art and innovation. She is interested in the clash of tradition and new technologies and its social and political implications. Her work has been exhibited internationally and was featured in the publications *Techno Textiles 1 & 2* (1998 and 2005). She is an award-winning designer for her woven and felted design work for the "Handweberei im Rosenwinkel" (1998-2001) in Germany. She has taught textile design, weaving and textile arts in Germany, Mongolia, Australia and Canada.