



Computer as machine

25 October 2009

The computer *is* the computer, and nothing else. If we want to understand this artifact better than only superficially, we must start from this seemingly trivial statement. (It is trivial because it is a tautology.) Soon enough in our attempt to understand the phenomenon of the computer, we will turn to a variety of metaphorical expressions. Each one will tell us what the computer may also be, or may not be, or what it may be considered to be. Metaphors will be necessary for a broader and deeper understanding. We understand by immediate insight (if this is possible at all), by illumination (in the almost religious sense of the word), or by embedding into contexts. When we embed one phenomenon into a context, what else can we do but talk in metaphors?

We must start from the assertion, „the computer is the computer, and nothing else“, because only this tautology allows us ontologically to take the computer for what it is (and not for what it is not).

Our meeting on 20 October didn't go very well, because we had too many things to do. In particular, the announced treatment of the topic „The computer as a machine“ was cut short. I spent too much time on other issues. I decided to make up for this short-cutting at least a bit by writing this note. I hope that some you will discover it on our website, perhaps read it, perhaps even tell others. I will ask you!

We started into the meeting by one of these didactic games. Everyone around the table was asked to, please, respond to the questions:

- How did you encounter the computer a first time?
- What are you nowadays mainly using the computer for?
- Do you possess your own computer?
- And how do you perceive of the computer, how do you think of it?

I like doing this sort of game in a class I am teaching. I often ask my secretary to type up all the answers in a big table. But if I want to this, I need to pass around a questionnaire. Here you spoke. Which is more fun in order to get to know each other a bit better. And also to occasionally ask a more detailed further question, or ask for an explanation.

So, clearly, all I can and will do here is to write down some summary remarks from my notes. Much of what the 21 students said will be lost. That's how it is.

The third question is simple: everyone possesses at least one computer. No-one said he or she has none. Many have had a computer at home, maybe not their personal one, from earliest years of their life.

First encounters were in the majority of cases triggered in one or the other way by fathers. That was amazing to me. You could generate the hypothesis: kids, in particular girls, relate to their fathers by his computer.

Many of you came into contact with a computer the first time when they were between 3 and 6 years old. In your generation, it usually took another ten years before you got your first own computer.

Remarks from you. When my computer is broke or gone, I am missing a part of myself. I decided to study art in order to get away a bit from the computer. There is a strange relation between me and my computer, but it's not sexual. That first Atari created a fever in me. (Know the song, You give me fever, when you kiss me, ...?) A father said to the girl: If you want to use it, do it well. Without the computer, I don't know what to do. It is head and hand for me. I don't feel attached to it, but I work a lot with it: it gives me access to a new world, to a new society. I felt naked when I left my computer behind.

Perhaps the most interesting formulation was this: The computer has become a materialization of my mind. Memory, the student said, becomes visual. The counter-question would be: have you read this somewhere, and made it become your belief, or is this your own perception? You know that these two statements fit into an ongoing discourse.

And perhaps the most dangerous remark was this: if you are not on Facebook, you don't get as much information. When I hear something like this, I am reminded of T. S. Elliot's lines:

Where is the wisdom we have lost in knowledge?

Where is the knowledge we have lost in information?

I like to continue this by adding:

... and where the information we have lost in data?

One student was shocked when for the first time she saw the results of an internet search. The computer is half of my life. The computer must be there to sustain my life. I use the computer for everything in daily life. I cannot live without it. Others say they love drawing or painting as a way of getting away from the sucking machine. My computer possesses me, but I own one. In case of fire, my computer would be the only thing I grab (that used to be a doll.)

Many of you, the majority, were first exposed to a computer by playing games. This interesting insofar as entertainment, fun, easy living, longing were first characteristics, subconsciously most likely, that you felt when the computer entered your world.

All the characterizations were mentioned (however, not very often): a machine, a tool, a device. It unites in its functionality everything, from typewriter to telephone. It gives you everything you want. (Think of it – can this be a correct statement?) It is a window to the world.

One student, who was quite enthusiastic about the computer, said, It's part of me. But it cannot substitute books. Reading from it is still hard.

There are clear signs, at least implicitly, of the one unique feature of the computer: it unites, represents, offers, does everything. Something universal is surrounding the computer. In Germany, people who understand only little of the computer (and even some who do), claim „the computer is the universal machine.“

This it is clearly not. However, the statement contains some truth. It is the universal machine of computation! Do you see the difference? There is a specific domain, the domain of computation, and this domain can be machinized by using just one single type of machine.

Nothing like this is known for any other domain of human activity. It is so because the very first actual computing machines that were constructed, were constructed for calculations. Alan M. Turing, who in 1936 invented (described) a paper machine that became the prototype of all electronic computers – later and by others called: the Turing machine – is responsible for all that. Because he proved that a given specific Turing machine can be programmed such that it can simulate each and every other Turing machine. Therefore, it is the universal Turing machine.

Some who thought a bit deeper about this fact, are convinced that it makes sense to identify the computer as the semiotic machine. Its subject matter are signs and sign processes. And a developed concept of sign tells us that the sign is an intrinsically recursive concept. We will deal with signs later in the course, therefore no more is to be said here. But keep in mind the *semiotic machine*.

Once we have accepted the computer as that what it is, when we start looking at the history of its appearance, we clearly see that it is a machine. The computer belongs to the means of production. Saying this, opens to the world of economics.

Humans live by working. Work (or labor) is production. It is the eternal condition of human life. No human (that is: human, not: animal) life exists without human labor. Human labor happens when one or several humans apply some means of production to some object of production, a process that requires the humans' force and capacity to work. Force, means, and object of labor or production must unite to produce. That's the most abstract description of work. It exists always and everywhere, independent of the particular historic situation.

The means of production are first just hands and other parts of the human body. But they become tools, and the tools become (in historic times) machines, and the machines become automata and media. First, manual labor becomes the subject matter of machines. In fact, machines appear where in a society tools get replaced, supplanted by more complex means of production. When this process of machines substituting human labor had developed far enough, mental labor became the new subject matter of machine application. The mental labor that was extracted from all mental labor to be transformed into standardized procedures, was computing and calculating. The computer became its machine.

You may have heard that in the 19th century there was still a profession, the computer. That was a human well trained in calculating. The first achievement of the computer machine was to replace the computer as human.

I could go on and on, and I will tell you a bit more when time is ripe. Let me finish this by indicating what we could, should, or must acquire:

- the historic situation when the computer appears (WW II)
- the tremendous difference between a human computer and the machine computer
- the concept of a sign
- the concept of an algorithmic sign
- the concept of human-computer interaction as a signal/sign process
- the concept of the semiotic machine.