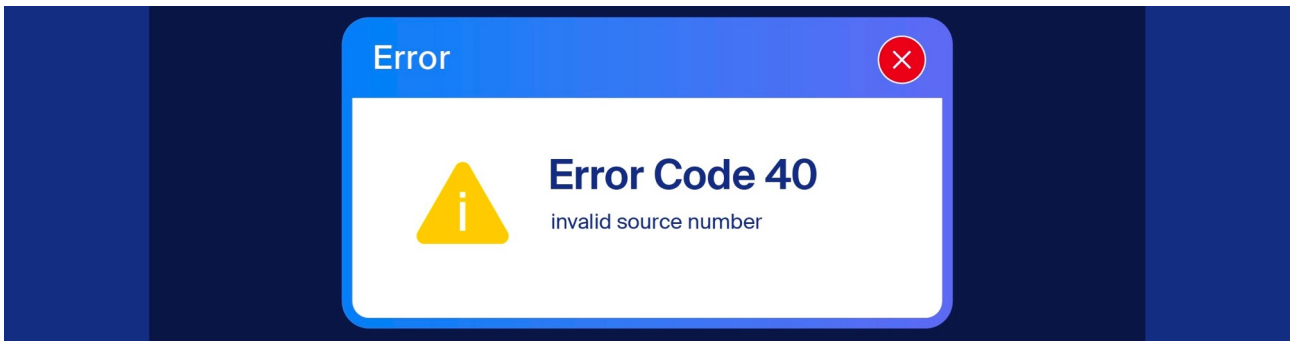


Box 1— The older generations of readers will have experienced this kind of message passing over their screens, leading at best to re-booting, at worst to wiping and reinstalling.

Error-codes are part of the history of computers. They typically address specialists who know what the codes mean, and are opaque to the general user. At the level of coding the specialist will be able to work on solving the error. But the general user is frequently advised to simply restart the machine. Nevertheless, the error codes have been a cultural part of the usership and disruptive experience in learning with machines. During the recent years they have become less frequent. In daily practice they have been replaced by e.g. by spell-check errors: machine generated errors.

So, in our time—following a 74 year history of machine learning—it is absolutely impossible to not have any record of this situation: (1) humans make spelling mistakes while typing; (2) the machine makes another mistake in correcting it. When it happens with *names* (which is often) the situation becomes patently absurd. We do not know exactly what to do with this record, unless we are nerds (and so can take steps to correct the issue). The general culture of usership assumes that these errors will eventually be taken care of. Does common sense indicate that this will ever happen?

It is a thorn in the eye of intelligence: both of human intelligence, and machine intelligence. So, what if we instead take such occurrences as *constitutive* of the human-machine relationship? Making a point of trouble-shooting in the human-machine relationship, in which human and machine errors have distinctive styles, but come together as a kind of enskilment emerging in this relationship. Ranging from the fixing videos that are locked to a personal computer—displays that won't have it because it is locked to a security system—to good old fashioned home-movie shows.

Making the film-strip coil in the right direction, avoiding jams, or mechanical problems of unknown origin that makes the projector dysfunctional. Solving the trouble without knowing exactly what the problem is, covers what we call trouble-shooting. Some people (with "big hands") are clearly better at this than others. Human and machine errors somehow record a different rhythmic signature: they occur at different points and frequency, and communicate differently. And we suspect that learning takes place when they combine, in adequate ways, and not by being eliminated (but by being moderated).

Box 2. Tourism to the polar areas has eventually turned into a cause of trouble. The polar environment is vulnerable and the tourism is disrupting the balance. Sjøberg NTB Scanpix.

To the left (**Box 2**) a photo of a situation where no such learning happens: a group of nature lovers with sufficient means are transported to admire Antarctic scenery, while the technology that frames this collectable experience, disrupts the precarious envon-mental balance on site. The compound message is troubling and not ready to be solved, because nothing appears to solve this kind of problem: nor to even define it in a proper way, apt to progress on the matter. We are standing still: indeed, it appears to cover our present relation to the world.

Does the source of our *troubled* relation to

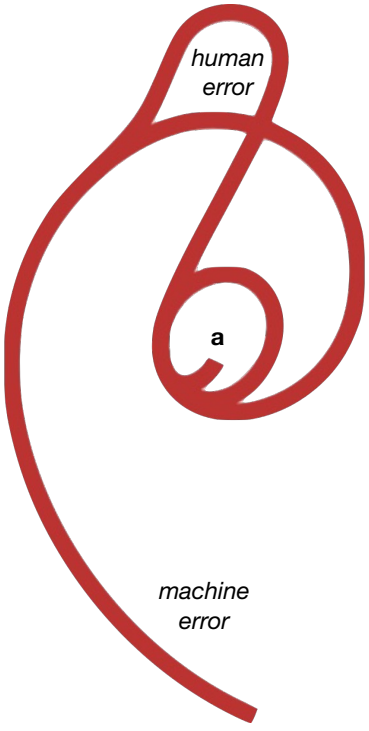
planet Earth generate from human- and machine error as a *compound* process? And, if so, is it possible to see the compound as the epitome of a dis-ordered system? The notion of the dis-ordered system rests on the emergence—or, growth, emergence or flowering—of a *third* (hetero-structural) occurrence from within the cross-pressure between *two* sequences in counter-point: in the present case, between *human* error and *machine* error. This third occurrence could be the awareness of the sequence/consequence as a difference that makes a difference, or information.

In Gilbert Simondon's perspective, *information* is what emerges from the kinds of relation between form and matter that occurs when a new individual is hatched: or, more specifically, with *individuation* (which is what Simondon investigates). In the present case, not only by the combined *learning* from experience with human errors (sequence) and machine errors (con-sequence), but from the emergence of a playground of a third—learning—*entity* which is *neither* human *nor* machine, but to which human being and machine may eventually turn out to *belong* (in alternating sums [below]).

It entails a shift of the way we are in the world called *anaptúxis*: a holon of growth, development and explanation. Not a generic entity, but an entity with a footprint from its ways with the world. It can be described otherwise than as a mystical entity. When considered a resident principle of machine learning—in a sense of learning in the human-machine compound—*anaptúxis* individuates as a specific vantage point, from which human- and machine errors will compute information (that exists *neither* in humans *nor* in machines alone). A vantage point with a meandering case-history.

It is a 3rd alternative to two vantage-points in *diatribe* concerning structuralism: but if what we call a *structure* is neither in the world nor in the human brain, *where* is it? If we switch from *where* to *when* the question becomes a lot simpler. If **x** and **y** are variants of Spinoza's thought and extension, then *anaptúxis* (**a**) is the vector defined by their sum. Then **a** is the vantage point from which one specific error-sequence defines as *human* (**p**) and the other specific consequence (**q**) defines as *machine*-error. We can see the errors from a vantage point neither human/machine.

Let us describe this in the following equation: $F_{\mathbf{x}}(\mathbf{p}) : F_{\mathbf{y}}(\mathbf{q})$. Since thought (**x**) and extension (**y**)—both *unique* and infinite—are here connected to *specific* (hence finite) errors **p** and **q**, they transpose to *body* (**x**) and *machine* (**y**). *Anaptúxis* (**a**) as a growing, developing and explaining entity, then can be subject to identification (which is not the same as naming) in the sense that **x** and **y** are attributed by *anaptúxis*, and hence are attributes gathered before the human-machine compound. Humans can identify with **x** and can attribute **y** to machines. That is, the compounded expression $F_{\mathbf{x}}(\mathbf{p}) : F_{\mathbf{q}^{-1}}(\mathbf{y})$.



Box 3—From the vantage point of *anaptúxis* **a** machine and human errors are not really errors but a difference that makes a difference. That is information (according to Bateson's definition).

Expounded: the human **x** identifying the error **p**—attributed to the machine **y**—compounds with the error $\mathbf{q}^{-1}$ found in the machine (e.g. as we go from the message *Error code 40* to the actual coding). In all: $F_{\mathbf{x}}(\mathbf{p}) : F_{\mathbf{y}}(\mathbf{q}) \approx F_{\mathbf{x}}(\mathbf{p}) : F_{\mathbf{q}^{-1}}(\mathbf{y})$. Or: $F_{\mathbf{x}}(\mathbf{p}) : F_{\mathbf{y}}(\mathbf{q}) :: F_{\mathbf{x}}(\mathbf{p}) : F_{\mathbf{q}^{-1}}(\mathbf{y})$. Where ≈ says *resemblance* and :: says *as*. The latter suggests more *accuracy* than the former. The point being that this equation from Claude Lévi-Strauss' adaptation of the Klein's group (**i, -i,** $\mathbf{i}^{-1}$**,** $\mathbf{-i}^{-1}$[a *term*, its *opposite* and their *inversions*]) is accurate, but also holds the track record of resemblances: *same*, *similar*, *different* and *other*. And in this sense has a footprint/case-history. A life-time is a glimpse of the **a**-*potential*.

Nothing here is new. And will a little bit of attention a large number of people will be able to confirm that what/how they learn while working with machines is different from when they don't. Machine learning takes them beyond what was previously imaginable, according to symbolic regimens that are *not* the bread and marmalade of imagination. When to discuss what is been learned, in this way, they get into trouble because they think that they are speaking out of their own minds and are constrained by the audience's imagination. But there are other ways of going at this: (**i**) engaging the available *presentation apparatus* to transpose the secrets *machine learning*; (**-i**) making it *public* rather than secret; ($\mathbf{i}^{-1}$) exposing the sum of the *elements*; ($\mathbf{-i}^{-1}$) and the elements of the *sum*. Engage with the art of *modelling*.