Review of: "[Essay] The Algorithm; Mind of a Virtual Era – Our Code of Codes"

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Potential competing interests: No potential competing interests to declare.

We make our science and technology, as we make our tools. And in the process we change

An Essay it is. Which means—trying. But trying without a clearly defined path, without a clear target, leads to confusing thoughts not to clarification. The subject of *how consciousness affects thinking* is of relevance not only because AI corralled society into a state of awe. Rather, because what it caught us unprepared. We, as part of humankind at this moment in time, actually do not fully understand what is going on, and even less what the long term consequences might be.

In my view Anna Aragno deserves credit for the questions she raised. It is obvious that a lot of reading is behind her meandering. But some of the reading is dubious: Carr, Domingos, Finn, and especially Harari (why would anyone quote him?) have nothing to contribute. No reason to argue here with the irrelevant. What actually is relevant is the lack of a deeper understanding of the algorithm. Aragno's definition is correct—*recipe.* In this sense, there's nothing new to report. As there is nothing to Muhammad ibn Musa al-Khwarizmi and the algorithm, at least not in the sense in of instructions for a machine. The abacus—a word (abq) related to sand (how do you count the grains of sand?), or to table (abax or abakon)— is an embodied algorithm for arithmetic. Therefore, every algorithmic computer is nothing more than an automated abacus.

The significance of the algorithm becomes evident when we go to the root of what led to algorithmic machines. This is the famous in *Entscheidungsproblem* formulated by Hilbert and Ackerman (1928)—is there a procedure for validating mechanically a mathematical proof? A bit more formally: given a set of axioms and a mathematical proposition can a procedure decide if it is provable from the axioms? Turing (1936) demonstrated there is none. In the course of demonstrating this, he came up with a machine that can process everything described through an algorithm. This means: a sequence of steps, a syntactic device, in which each step is the cause for the next (a deterministic device). The recipe as a syntactic expression (describing what is done) can be automated. The entire algorithmic part of mathematics was automated using algorithmic computers.

What changed human activity since the beginning of algorithmic computation is the fact that a large variety of actions can be reduced to a recipe can now be processed automatically. This is how the exploration of the outer space became successful. This how genetics, misunderstood as the foundation of life, provided means to identify individuals (in court or for some other reasons). There is no meaning to account for. Riding on this horse, the proponents of Artificial Intelligence

advanced the notion that intelligence itself is algorithmic. With Hilbert in mind, we know that this is not the case. Machines, whether mechanic, hydraulic, electric, digital, etc. do not have any understanding of what they process, and even less of the outcome. There is no meaning in the algorithmic processing. Norbert Wiener (mentioned in the Essay) was aware of this.

Let me be clear: The language Ana Aragno used in discussing the issue of the new human condition is unclear. She's often confusing concepts—signal and semiotics belong to different knowledge domains. Shannon did not contribute to information theory but to the engineering of data transmission (cf. Nadin 1992, et al) Again, Wiener was closer to the realization that data and information are not the same.

No reason for me to highlight conceptual errors. But there is a need to understand that semiotics, if not practiced rigorously, becomes a ridiculous set of funny words. Psycho—often referred to—is not only funny but misleading. Machines are not semiotic devices--they are embodiments of a limited understanding of causality, i.e determinism.

With this in mind if Anna Aragno decides to rethink her paper and adhere to the ethics of terminology Perice argued for, I will read it again. The subject is important.

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