

# Writing with Automated Machines: Between Translation and Sabotage

Ana Marques

UNIVERSITY OF COIMBRA

## ABSTRACT

A generative text is a system constituted by non-conscious and conscious cognizers, digital and analogue processes, and mathematical and linguistic modes of representation. But how do algorithms cognize? And how is meaning constructed in a system where authorial intentions and readers' experiences and interpretations are mediated by algorithmic agents? Through the analysis of *How It Is In Common Tongues* (Cayley and Howe, 2012), I intend to discuss the tensions that arise from the encounter between algorithmic and human cognition, and between the regimes of information and expression. Drawing on Katherine Hayles' view on the cognitive non-conscious and Claude Shannon's information theory I will start by establishing a distinction between information and meaning, between communication and expression, and between the regimes of information and of the literary. To reflect on the political ecology of digital mediation (situated in the informational regime of cybernetics), I will consider Matteo Pasquinelli's perspective on the co-evolution of technology and economics, and discuss how algorithmic cognitive processes embody and reinforce the structures of contemporary cognitive capitalism. Finally, I will discuss the strategies of resistance enabled by aesthetic approaches to computation, such as the ones explored in this case study.

## KEYWORDS

cybernetics; cognition; information; meaning; aesthetics.

## RESUMO

Um texto generativo é um sistema constituído por cognitores inconscientes e conscientes, processos digitais e analógicos, e modos matemáticos e linguísticos de representação. Mas em que consiste a cognição algorítmica? E de que modo é construído o sentido num sistema em que as intenções autorais e as experiências e interpretações dos leitores são mediadas por agentes algorítmicos? Através da análise de *How It Is In Common Tongues* (Cayley and Howe, 2012), pretendo analisar as tensões que surgem a partir do encontro entre cognição algorítmica e humana, e entre regimes de informação e de expressão. Com base na visão de Katherine Hayles sobre cognição não-consciente e na teoria de informação de Claude Shannon, começo por estabelecer uma distinção entre informação e sentido, entre comunicação e expressão, e entre os regimes de informação e o literário. Para refletir sobre a ecologia política da mediação digital (situada no regime informacional da cibernética), considerarei a perspectiva de Matteo Pasquinelli sobre a coevolução da tecnologia e da economia, e considerarei como os processos cognitivos algorítmicos incorporam e reforçam as estruturas do capitalismo cognitivo contemporâneo. Por fim, referirei as estratégias de resistência possibilitadas pelas abordagens estéticas da computação, como as que são exploradas neste estudo de caso.

## PALAVRAS-CHAVE

cibernética; cognição; informação; sentido; estética.

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In her paper “Cognition Everywhere,” Katherine Hayles clarifies the differences between conscious, unconscious and nonconscious cognition by stating that “while all thinking is cognition, not all cognition is thinking. (...) the cognitive nonconscious operates at a lower level of neuronal organization not accessible to introspection” (Hayles, 2014). Conscious cognition is thus associated with self-reflexive awareness. On the other hand, while the unconscious may be reached through introspection, the nonconscious cannot.

According to Hayles, there are four criteria that make nonconscious systems cognitive. They

operate within evolutionary dynamics, (...) they are adaptive, (...) complex (...) and constraint driven, (...). Together, these properties enable such systems to perform modeling and other functions that, if they were performed by a conscious entity, would unquestionably be called cognitive. (Hayles, 2014)

The crucial distinction between material and cognitive processes is choice. The action of choosing is context-dependent and context-driven, and it necessarily implies interpretation: if there is no choice, but only one option, there is nothing to interpret. A computer process, despite being deterministic, makes interpretative choices as it performs its tasks (yes or no, if then else, ...), which implies interpretation. As Hayles states, “[I]nterpretation is deeply linked with meaning (...). [F]or the cognitive nonconscious, however, meaning has no meaning.” This means that meaning is one thing for nonconscious cognitive systems and another for human subjects. To avoid this terminological problem, perhaps we should use the term “information” instead of “meaning.” I believe the difference between these two notions is central to the discussions on technology in the context of the humanities.

The *Online Etymology Dictionary* associates “interpretation” with “translation,” “explanation” or “exposition.”<sup>1</sup> The act of interpreting is linked with

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<sup>1</sup> *interpretation* (n.) mid-14c. “a translated text, a translation” (late 13c. in Anglo-French), from Old French *interpretacion*, *entrepreatiun* “explanation, translation” (12c.) and directly from Latin *interpretationem* (nominative *interpretatio*) “explanation, exposition,” noun of action from past participle stem of *interpretari* “explain, expound; understand” (see *interpret*). From late 14c. as “act or process of explaining or interpreting; an explanation; construction placed upon an action.” Meaning “dramatic or musical representation” is from 1880. <https://www.etymonline.com/word/interpretation>

translating something into different terms, as a way to explain, expose or understand. In this sense, interpretation is prior to meaning production: we interpret by translating something, making it intelligible and, hence, meaningful. And, indeed, a computer interprets information precisely by translating one language into another, and commands into actions. The same dictionary associates “meaning” with “intend,” “have in mind,” “signify,” “make known,” “have an opinion,” or “to think.”<sup>2</sup> All these terms express a subjective position. Meaning is thus subjective and hence, ambiguous, it is relative and contextual. In contrast, information is quantifiable precisely by ignoring context. When Claude Shannon developed his information theory he saw how context adds noise to information, making the latter impossible to quantify. His solution was to discretize information, separating it from context. This digitization process inevitably implies a reduction, or compression. In this sense, perhaps we can say that information is what remains of the digitization of meaning. While information is quantitative, meaning is qualitative. Irreducible to the unambiguous discreteness of information, meaning is thus virtually incomputable. Moreover, while the regime of information is concerned with communication, or with efficiency in the transmission of messages, the regime of meaning is concerned with expression, or with the gradients of ambiguity that noise and context enact. Literature doesn’t belong to the field of information and communication, but to that of meaning and expression. But the regime of information that characterizes the cognitive abilities of our technical devices seems to be more and more culturally pervasive. In a cybernetic and biopolitical context, concerned with statistics and preemptive control, distant reading strategies and the search for patterns in the chaotic complexity of the world seem to be allegories of how human cultures are being influenced by technical nonconscious modes of cognition, associated with the efficiency of beehives or computers.

Digital devices are imbued with artificially generated cognitive abilities that are not neutral. Rather, their design reflects and reinforces the socio-political ground on which they operate. The relationships between digital technologies and the institutions of power leave an inevitable imprint on our digital devices’ operating modes, affecting their usage and perception as cultural objects and as actants. In his analysis of the relationships between contemporary cognitive capitalism and digital technologies, Matteo Pasquinelli has argued that economy and technology have co-evolved, mutually reinforcing each other:

Contemporary capitalism has evolved along two main vectors of abstraction: monetary abstraction (financialization) and technological abstraction (the algorithms of

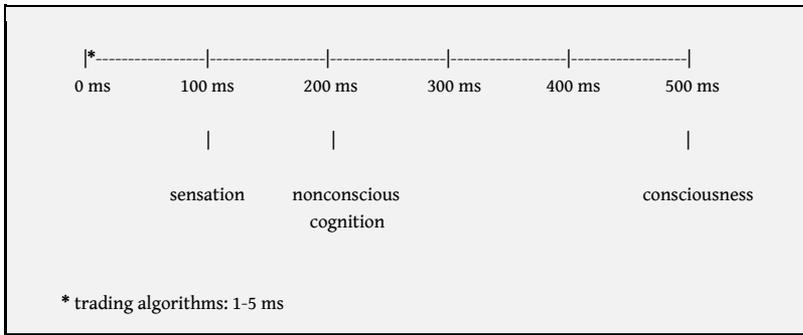
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<sup>2</sup> *mean* (v.1) “intend, have in mind,” Old English *mænan* “to mean, intend, signify; tell, say; complain, lament,” from West Germanic *\*mainjan* (source also of Old Frisian *mena* “to signify,” Old Saxon *menian* “to intend, signify, make known,” Dutch *menen*, German *meinen* “think, suppose, be of the opinion”), from PIE *\*meino-* “opinion, intent” (source also of Old Church Slavonic *meniti* “to think, have an opinion,” Old Irish *mian* “wish, desire,” Welsh *mwyn* “enjoyment”), perhaps from root *\*men-* (1) “to think.” Conversational question *you know what I mean?* attested by 1834. <https://www.etymonline.com/word/mean>

the metadata society). Expressed within the diagram of organic composition of capital (Marx 1867: 762), it means: the technical composition has evolved towards the algorithmic abstraction of networks (*data governance*), the value composition towards the monetary abstraction of derivatives and futures (*debt governance*). (...) Algorithmic trading or *algotrading* is a good example of the combined evolution of these two *machinic lineages*. (Pasquinelli, 2014)

Indeed, trading algorithms show us how the monetary and technological abstraction of value became intertwined: they embody the way capitalism accompanied the emergence of nonconscious cognition in technical systems, showing us how capital has become self-intelligent.

So how do these agents work? Nonconscious cognizers operate under the radar of human perception: they are too fast to be grasped, too small to be seen, too specialized and obscure to be understood.



**Figure 1.** Cognitive timeline presented by Katherine Hayles at the Rethinking the Mind of Architecture conference.<sup>3</sup>

This cognitive timeline, presented by Katherine Hayles at a conference called “Rethinking the Mind of Architecture,” shows the temporal scale within which trading algorithms operate. While human consciousness takes half a second to process information, trading algorithms take one to five milliseconds. There is thus a “missing half-second” in human consciousness, and a gap between the latter and electronic interactions in non-organic materials (such as those that take place through optical fiber networks), which are physically faster than neurotransmission in brain circuits.

In a world increasingly inhabited by interconnected algorithmic agents whose cognitive modes belong to a temporal and perceptual scale that is incompatible with that of human consciousness, it becomes important to reflect on what it means to articulate human life with cognitive technical systems. We are already taking advantage of our digital media cognitive abilities, for example in the digital humanities, using computation to macro-analyze vast quantities of

<sup>3</sup> See minute 23 of the video available at: <https://www.youtube.com/watch?v=4p0bXPdZoAA>.

cultural data. This quantitative aspect of information management has proven its importance in diverse fields of human culture, and it has fueled the development of our digital technologies through, precisely, their economical embodiments. So although our digital tools have much to offer us in what concerns information and knowledge, they must also be understood as artifacts that are deeply and already embedded in the economic and technological infrastructure.

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Rather than polarizing the debate on technics between techno-phobia and technophilia, one must come to terms with the contradictory nature of technology. Bernard Stiegler recovered the Greek notion of the *pharmakon* to consider how technology is always a poison and a remedy at the same time. Artists and poets have also been critically exploring programmable tools in order to better understand their affordances and constraints. The case study I am bringing to our discussion is one of such experiments. *HIICT* is a generative literary work by John Cayley and Daniel C. Howe, based on the programming of an algorithm to produce a text. But unlike most generative literary works, which are based on combinatorial procedures that reshuffle a predefined textual database, this program operates with Google's search engine, taking the whole of the Internet as a database and making searches of combinations of words that replicate Samuel Beckett's *How It Is*. *HIICT* is thus a reconstruction of Beckett's novel.

Beckett is one of the most protected authors in terms of copyright laws. What Cayley and Howe did was to transform a proprietary text into a non-proprietary text, erasing the figure of the author. As stated in the work's last page,

This book was composed by searching for the text of Samuel Beckett's *How It Is* using a universally accessible search engine, attempting to find, in sequence, the longest common phrases from *How It Is* that were composed by writers or writing machines other than Beckett. These phrases are quoted from a portion of the commons of language that happens to have been indexed by a universally accessible engine. (Cayley and Howe, 2012)

The result is this:

how it was I quote<sup>1</sup> before Pim with<sup>2</sup> Pim after Pim<sup>3</sup> how it is  
three parts I<sup>4</sup> say it as I hear it<sup>5</sup>

voice once without<sup>6</sup> quaqua on all sides<sup>7</sup> then in me when<sup>8</sup> the  
panting stops<sup>9</sup> tell me again finish telling me<sup>a</sup> invocation

past<sup>b</sup> moments old dreams<sup>c</sup> back again or fresh like those<sup>d</sup> that  
pass or<sup>e</sup> things things always and<sup>f</sup> memories I say them as I<sup>10</sup>  
hear them murmur<sup>11</sup> them in the mud

in<sup>12</sup> me that were without<sup>13</sup> when the panting stops<sup>14</sup> scraps of  
an ancient voice in<sup>15</sup> me not mine

my<sup>16</sup> life last state last version<sup>17</sup> ill-said ill-heard ill-recaptured<sup>18</sup>  
ill-murmured in the<sup>19</sup> mud brief<sup>a</sup> movements of the lower face  
losses<sup>1b</sup> everywhere

recorded<sup>1c</sup> none the less it's<sup>1d</sup> preferable somehow<sup>1e</sup> somewhere

<sup>1</sup>[www.nytimes.com/books/first/w/wiesel-sea.html](http://www.nytimes.com/books/first/w/wiesel-sea.html) (Aug 14, 2012. 1)

<sup>2</sup>[www.cameracellularphone.org/tag/device](http://www.cameracellularphone.org/tag/device) (id. 1)

<sup>3</sup>[www.kwarmmeud.com/darknesslakorns/?p=1501](http://www.kwarmmeud.com/darknesslakorns/?p=1501) (id. 4)

<sup>4</sup>[www.youtube.lu/watch?v=MA5ddbn\\_2LM](http://www.youtube.lu/watch?v=MA5ddbn_2LM) (id. 2) <sup>5</sup>[cucurbite.wordpress.com/](http://cucurbite.wordpress.com/) (id. 2620000)

<sup>6</sup>[gorwathawarband.guildlaunch.com/forums/viewtopic.php?t=8563276](http://gorwathawarband.guildlaunch.com/forums/viewtopic.php?t=8563276) (id. 2)

<sup>7</sup>[pplsorce.com/people/Jim\\_Quaqua/](http://pplsorce.com/people/Jim_Quaqua/) (id. 3) <sup>8</sup>[celebrityzap.com/AJ\\_Langer.html](http://celebrityzap.com/AJ_Langer.html) (id. 5)

<sup>9</sup>[www.parrothouse.com/hlthcare.html](http://www.parrothouse.com/hlthcare.html) (id. 4290)

<sup>10</sup>[kindle.amazon.com/work/sample?asin=B002HHLW4M&tr=1&publisher=A3SWXVW6](http://kindle.amazon.com/work/sample?asin=B002HHLW4M&tr=1&publisher=A3SWXVW6)

<sup>11</sup>[sonicliving.com/artist/182670/past](http://sonicliving.com/artist/182670/past) (id. 3200) <sup>12</sup>[www.blurp.ca/tags/design](http://www.blurp.ca/tags/design)

(id. 25) <sup>13</sup>[www.iraised.it/s/web/index.php?page=7&q=come-back-quotes](http://www.iraised.it/s/web/index.php?page=7&q=come-back-quotes) (id. 3)

<sup>14</sup>[www.sqlsaturday.com/158/privacypolicy.aspx](http://www.sqlsaturday.com/158/privacypolicy.aspx) (id. 7070)

<sup>15</sup>[www.ilovephilosophy.com/viewtopic.php?f=5&tr=142604&start=75](http://www.ilovephilosophy.com/viewtopic.php?f=5&tr=142604&start=75) (id. 1)

<sup>16</sup>[pulsitemeter.com/military/Past-of-Hear.html](http://pulsitemeter.com/military/Past-of-Hear.html) (id. 2) <sup>17</sup>[www.bartleby.com/84/31.html](http://www.bartleby.com/84/31.html) (id. 29900)

<sup>18</sup>[www.facebook.com/dctowing](http://www.facebook.com/dctowing) (id. 7860) <sup>19</sup>[ifpoa.com/headlines/resignation.htm](http://ifpoa.com/headlines/resignation.htm)

(id. 68300) <sup>1a</sup>[www.cioran63.com/archief76.html](http://www.cioran63.com/archief76.html) (id. 9)

<sup>1b</sup>[circle.ubc.ca/bitstream/handle/2429/22333/UBC\\_1980\\_A1\\_M37.pdf?sequence=1](http://circle.ubc.ca/bitstream/handle/2429/22333/UBC_1980_A1_M37.pdf?sequence=1) (id. 1)

<sup>1c</sup>[twicys.com/i/XVig9](http://twicys.com/i/XVig9) (id. 8) <sup>1d</sup>[garagepunk.ning.com/profile/deuceclosely](http://garagepunk.ning.com/profile/deuceclosely) (id. 1)

<sup>1e</sup>[avevilonaso.comyr.com/life-in-forsyth-finnegans-wake.php](http://avevilonaso.comyr.com/life-in-forsyth-finnegans-wake.php) (id. 1) <sup>1f</sup>[krex.k-state.edu/dspace/bitstream/2097/9824/1/LD2668R41985B72.pdf](http://krex.k-state.edu/dspace/bitstream/2097/9824/1/LD2668R41985B72.pdf) (id. 1)

<sup>1g</sup>[www.highbeam.com/doc/1G1-63262234.html](http://www.highbeam.com/doc/1G1-63262234.html) (id. 4430)

<sup>1h</sup>[www.goodreads.com/trivia/submitted/1057191-jason](http://www.goodreads.com/trivia/submitted/1057191-jason) (id. 1)

<sup>1i</sup>[www.ustream.tv/recorded/24228375](http://www.ustream.tv/recorded/24228375) (id. 843) <sup>1j</sup>[www.xula.edu/cpsc/cs/megang/](http://www.xula.edu/cpsc/cs/megang/) (id. 19600)

<sup>1k</sup>[socrates.berkeley.edu/~plab/Palmer\\_Chap-08.pdf](http://socrates.berkeley.edu/~plab/Palmer_Chap-08.pdf) (id. 5710)

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**Figure 2.** John Cayley and Daniel C. Howe, *How It Is In Common Tongues* (2012).

Discretized in blocks of words, Beckett's text was entirely cited from the Internet and all the links for the sources of each group of words are available as footnotes. We might say that as we read *HIICT* we are reading Beckett's *How It Is* but, as John Cayley argues,

it is also possible to assert that is not Beckett but rather something that I have written together with Google, where we have conspired to calculate a maximal syntagmatic association with Beckett's texts while ensuring that these sequences are attributable to (...) many others, and we do this (...) by a contemporary form of citation. It is a relatively nice problem to consider whether this text infringes copyright. (Cayley, 2011)

*HIICT* explores the practice of writing on and with the web, and understands the web as a tissue (or *textum*) composed of many automatic reading and writing processes. When a given piece of language (or even a simple utterance expressed in the gesture of clicking a button) is indexed by Google, it becomes data, meta-data, information, and value. And all this work of subjection to the informational regime of cybernetic administration, where technique and knowledge are monitored and monetized, all this work is made by algorithms operating in a scale and frame that is alien to that of human conscious perception. More and more aspects of human culture are being mediated by a complex network of algorithmic cognizers designed to operate on and to maintain a certain grid of economic positions and practices. The machines of the industrial age evolved to become abstract machines operating on hardware, on logistics and infrastructures. Human knowledge generates nonconscious cognizers that extract value from human knowledge, in a cyclic movement connecting separate cognitive systems, combining them in a complex network of human and algorithmic agents performing under a set of unilaterally and non-explicit established rules. Given such a context, *HIICT* engages in exposing and resisting the ways in which "cognitive" capitalism captures, regulates and extracts value from the shared field of cultural production, including our common uses of language. *HIICT* thus resembles the practices of the Luddites, textile workers who, in the nineteenth century, and faced with the threat of the effects of mechanization and the consequent threat of obsolescence of their work, sabotaged industrial machines in an attitude that, far from the specter of techno-phobia, aimed at resisting the naturalization of the exploitation of the human as a variable (in Flusser's terms) in the human-machine binomial. As Cayley and Howe explain,

Our literary aesthetic agents ignore and transgress network services' unilaterally-asserted 'terms of use', and build from this resistance a conceptual literary artifact intended as both commentary upon, and critique of, the vectorialization of search; especially of search understood as linguistic practice and as practice-based research. (Cayley and Howe, 2013)

As a re-writing of Beckett's text, *HIICT* subverts the questions associated with authorship, copyright and property that characterize print culture and that have also been adopted by monopolistic tech corporations, ending the illusions of the peer-to-peer global network imagined during the first years of the so-called digital revolution. And it does so in two different and combined ways: by

rewriting a book that is heavily protected by copyright laws, and by programming a nonconscious cognizer that uses one of the biggest tools of one of the largest Big Data corporations, ignoring its unilaterally imposed terms of use.

At the same time, the maneuver of appropriation (and liberation) of a copyrighted text is parallel (and opposite) to the maneuver of appropriation adopted by Google in what concerns the “commons of language.” The artistic value of this work resides in this double-fold operation of regeneration and reclaiming: taking a digital tool that embodies the contradictions of digital culture, and turning it upside down, to make it work as a tool for liberating a proprietary text.

The regime of quantification and datafication of language and life is socially situated and serves old dynamics of privatization of the commons, today by means of the circumscription of human activity in a cybernetic system. Language reacts when poets speak, and *HIICT* is a speech act that creates meaning in the algorithmic landscape of the network by creating, within it, a literary context. *HIICT* is engaged in reflecting on the tensions between human and machinic cognition, between human and posthuman language, between language as an instrument for meaning production and expression, and the algorithmic language that works behind the scenes of our writing, categorizing, indexing and monetizing it. Finally, and to return to the question of meaning production in nonconscious cognizers, we may argue that the literary value and the meaning of both *How It Is* and *HIICT* resides only in human reading and interpretation. To the nonconscious cognizers that generated this work none of the two texts exist, but only sets of patterns and links corresponding to binary sets of information. The text, understood as a tissue of meaningful linguistic utterances, is thus incomputable.

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