Machine Co-authorship(s) via Translative Creative Writing

Aaron Tucker
York University/Ryerson University
artucker@yorku.ca

ABSTRACT

This paper argues that machine translation and a symbiotic ecosystem of authorship are central to the poetic works of Aaron Tucker and reveal larger ethical paths for machine-human relationships. In particular, the elements of chance alongside the intersemiotic translative acts that are the nature of human-computer relationships give space to a potential futurity that challenges a human-centric understanding of “reading” and “writing” and generates a type of literature that encourages a reader to better understand their own interactions within their daily digital environments.

ESSAY

INTRODUCTION: OUTLINING THE CHESSBARD, LOSS SETS, AND O/Ô

Gideon Lewis-Kraus, in “The Great A.I. Awakening,” observes that Google Translate “serves more than 500 million monthly users in need of 140 billion words per day,” and is, as such, a key example of the language acts that take place within the dense networking capabilities of the contemporary internet. In particular, Google Translate, boosted by neural networks, has recently shown significant increases in processing speed and its artificial intelligence (AI), (New York Times). In turn, the app’s Bilingual Evaluation Understudy Score (BLEU) score, “which compares a machine translation with an average of many reliable human translations,” has improved by leaps and bounds (ibid.). The dramatic increase in the abilities of Google Translate is just one example of the ways in which computers are improving their ability to reliably recognize, imitate and undertake acts of translation; because of such innovations, Google Translate is a central site for my own considerations of how
machine translation effectively fits into a contemporary creative writing and pedagogical practice. In basic ways, drawing attention to “traditional” interlingual acts of translation, at grammatical and semantic levels of language, forces one to consider each word in potentially rigorous, yet playful, ways. Poets from the French OULIPO movement and experimental writers of the last century knew this; their undertaking of homophonic, homolinguistic, and/or interlingual translations were methods for those writers to explore the boundaries of what a language was capable of, and to nudge past efficient communication as end goals. These practices are still used today: Charles Bernstein includes them in his “Writing Experiments” at the University of Pennsylvania (upenn.org), with these techniques also used in works by Caroline Bergvall and Hugh Thomas, to name just three examples.

Including computers in acts of translation brings critical attention to how symbiotically we collaborate with those computerized machines in our daily acts of writing and reading. This co-activity includes publishing platforms and social media sites, but in the context of my own work, co-operating algorithmically with a computer allows me, as an author, to extend myself beyond my own “human” rationality and employ the OULIPO techniques of chance and randomness quickly and efficiently, often with startling results. In the arc from “source” document to “finished” translations, involving machine co-authors and co-translators draws out the many mediums and materials that can be employed in a creative writing practice: this can mean, of course, the medium of the written language, but it also means the electronic pulses of a computer processors’ logic gates, the texture of photographic paper, the back-and-forth zig-zag of a 3D printer, or a laser cutter.

In my creative writing, this mindset has manifested in three projects that use different computational translation processes as modes of exploring human-machine authorship and conceptual writing. First, The ChessBard (chesspoetry.com; 2015) is a project I co-created with Jody Miller that allows a user to upload chess games in PGN (the digital file format for storing chess games) and translate them into poems.
“Click this animated demonstration of The ChessBard to see it in action. Load time could be up to one minute after you click it. A demonstration of how chess moves produce lines of poetry.”
At the website, there is also a space for a reader to play against a chess AI: as the computer and reader play, their corresponding poems are generated in real time. These poems are derived from twelve source poems I wrote (6 poems for the white pieces, 6 poems for the black pieces): there is a 64 word poem for each colour’s pawns, knights, rooks, bishop, queen and king (chesspoetry.com/original-poems/). In basic principle, when a piece lands on a square it triggers a word from the source poems and the translator compiles them together and outputs a poem. In actuality, this process is more complex: before any move is recorded, the app selects a basic language template; this template is composed of some combination of seven basic units of English: verb, noun, adjective, adverb, article, conjunction, and preposition (a simple template might be ADJECTIVE NOUN CONJUNCTION ADJECTIVE NOUN). Therefore, each piece/square pair has seven language possibilities and when the piece lands on a square, it fills in the part of the language template assigned. Chesspoetry.com holds a wealth of resources on the different stages of the project (chesspoetry.com/about/; chesspoetry.com/about/archives/); in addition, while the bulk of this paper will speak to my use of machine translation, those interested in further explanation of the project can read the full-length poetic statement that also accompanies the app online (chesspoetry.com/poetics/). The statement works through three questions “Why Chess?,” “Why Computers?,” and “Why Poetry?” By responding to these questions I make the argument that The ChessBard is working at the nexus of the long histories of artificial intelligence, chess playing and its metaphors, and conceptual and generative poetry; by gesturing deliberately to these multiple legacies, I situate my own critical making practice in the contexts of computational creativity and poetic play. The latest version of ChessBard was exhibited in Porto, Portugal (2017), wherein we attached the online translation API Yandex to The ChessBard, so that when each English stanza was completed, it was then translated a third time into Portuguese. Finally, the project also has a more static form, Irresponsible Mediums: The Chess Games of Marcel Duchamp (2017). The ChessBard project originally drew direct inspiration from the performance Reunion (1968), a chess game played between Duchamp and John Cage in 1968, wherein the two had a custom chessboard specially designed so that when a player moved a piece to a square it triggered a note; the game played between Duchamp and Cage then become a sonic event, translated from the chess game. As such, Irresponsible Mediums (2017) translates the corpus of Marcel Duchamp’s recorded chess games into poems, and also includes an introduction from two-time women’s U.S. chess champion Jennifer Shahade. The ChessBard project has many forms and collaborations and represents my first foray into incorporating machine co-authors into my practice in a direct and expansive manner while also laying the groundwork for my thinking through the many different ways computers actively symbiotically participate in my daily computational environments.

My second project, Loss Sets (2016), is a collaboration between myself, poet Jordan Scott, and programmers Namir Ahmed and Tiffany Cheung, in which Scott and I have co-written poems under the general theme of “loss” (aarontucker.ca/3-d-poems/). As the next step in the process, I break down these poems, with a Python script, into units of three characters and map each character
to what is, at this point, a simple algorithm where the letter a=1, b=2 etc. Once converted, the groups of three characters form a point in 3D space (an x,y,z coordinate); as an example, the word “the” would become the coordinate “20,8,5”. These points in space are then collected and combined with geospatial data (latitude, longitude, and spot height) from the decades of ice erosion that have taken place at the Columbia Icefields in Alberta, Canada. All of these data points are then processed using Rhino, a 3D modeling software program, and Grasshopper, a Rhino plug-in: the sculpture begins as a cube and as the points are are added via the Grasshopper algorithm, they “carve” portions of that cube away. Once all the points have been processed, we print these as 6-inch cube sculptures using a Lulzbot TAZ 3D printer. Resisting the notion built into the oft-rhapsodic popular discussion of 3D printing of “a utopian, post-capital world in which any object can be made or replaced” (ibid.), *Loss Sets* “aims to respond to the multiples of loss (physical, environmental, artistic, personal) that occur in our contemporary moment and, as such, the poems respond to a number of topics that include ISIS’s destruction of millennium-old artwork, the melting of Canadian ice fields and sculptures, the death of loved ones, prosthetics, decaying memories” (ibid.).

**LOSS SETS 3D VIEW. CLICK ON THIS LINK:** [HTTPS://BIT.LY/33G14NL](https://bit.ly/33o14nl)

Extending from my work with *The ChessBard*, *Loss Sets* moves the acts of translation from the virtual cyberspace into the realm of physical materiality, and, as such, also involves more obvious hardware (that is, the 3D printer) and therefore places more overt attention on the physical computational and machine devices that surround us. As I have written previously (Tucker 2018; Tucker 2019), 3D printing included in a humanities context brings the potential to engage research driven by the unique strengths of the technology: the ability to replicate an object quickly and variously; the ability to visualize complex information in physical materiality; and the ability to manipulate an object’s tactility and scale. Extended beyond this generalized discussion set in a digital humanities tradition, my prior writings are useful here to contextualize it as a complementary node in my writing network that further engages the contemporary understandings of machine and human translation.

Lastly, *O/Ô* is a solo project that uses the Google Translate’s in-app camera function to translate the French and English Canadian parliamentary hansards (the official record of debates in parliament), reframing them as photographic concrete poems. Because Canada is an officially bilingual country, the hansard is in both French and English and so computer programmers used the texts as a sort of Rosetta Stone to train some of the earliest machine translators (theblastedtree.com/o-o).
uses the Google Translate camera function to translate the French and English Hansard proceedings for the day that the song “O Canada”/“Ô Canada” was officially adopted as the Canadian national anthem. Doing so challenges notions of national identity and who exactly is recognized by such an anthem, who is left out, and which languages are accepted, and why. By focusing on the translations as visual, rather than textual and/or tactile elements most present in *The ChessBard* and *Loss Sets*, I am further destabilizing the semantic value of such political proceedings, forcing a closer re-reading of the national choices made within my chosen source documents of the hansard.

Taking all three of these projects together by centrally involving machine translations in my creative writing, I am encouraging a recognition of the ongoing “process of technologization, based on the idea of a radical interdependence or mutual interpenetration” between human, animal and machine species (Nayar 20). Pramod K. Nayar aligns himself with Rosi Braddotti in advocating for a critical posthumanism, rather than a simpler posthumanism or transhumanism. Braddotti defines such as view as resisting a individual-focused and Euro-centric humanism (46-48) and emphasizes “an enlarged sense of inter-connection between self and others, including the non-human or ‘earth’ others” (48); she continues that such “posthuman subjectivity expresses an embodied and embedded and hence partial form of accountability, based on a strong sense of collectivity, relationality and hence community building” (49). Any project I want to take on needs to move beyond quickly beyond novelty and wonder and into an argumentative space that challenges its audience to consider their own collectivity in the computational ecosystems that surround them. From this perspective, a creative writing practice involves many communal acts across species, and asks that the writer and the reader examine how their own bodies, virtual and physical, play into the different aspects of a work. Drawing further from writers like Tara McPherson, Anne Balsamo, and Karen Barad, my own works are the expressions of my struggles with my posthuman subjectivity in the contemporary, and the dense network of networked posthuman subjectivities and the languages and modes they use to express themselves. As such, I see my projects, and the intersemiotic translations they undertake, as harbingers of the types of future examples of cooperation with machines that push beyond the perceived exceptionalism of “pure” human rationality; following this ethics of collectivity and cooperation, the act of writing becomes a dense ecosystem of simultaneous and multiple actions and authors.

**INTERSEMIOTIC AND POETIC ACTS OF TRANSLATION**

Translation is a central hub in my creative writing practice and the filter through which I’ve chosen to enact the arguments of my texts. Yet, I have been struggling with the word “translation” and my justifications for choosing to use it. This was most clear to me when, after I gave an artist talk at the 2016 Electronic Literature Organization’s festival in Victoria, Canada, a scholar in the
question-and-answer period asked why I had used the word “translate,” as opposed to Jay David Bolter and Richard Grusin’s notion of “remediate” (2000), or Lev Manovich’s concept of “recoding” (2002). The question gave me pause and I have been considering my motives ever since. To begin, when I use the verb “translate,” I am referring to the entire process of getting from source to final product, not just the source and translated final products themselves. This is essential as it acknowledges the many, varied steps that are undertaken when an object moves from one form to another. I deploy it knowing that the term “translate” is itself very slippery and is used across a wide array of disciplines: in Food and Nutrition Studies it is “the process of protein synthesis on the ribosome, when the information in mRNA is translated into the amino acid sequence of the protein” (Bender); in Mechanical Engineering it is “[a]ny change in the position of an object or particle excluding rotation” (Atkins and Escudier). From a more straightforward semantic perspective, the OED defines the word “translation” first as “The restatement of the forms of one language in another: the chief means of exchanging information between different language communities” (McArthur, Lam-McArthur, and Fontaine). The through-line through these definitions helpfully frames “translation” as an act that has very little to do with humans exclusively or human exceptionalism – any species that synthesizes protein, for example, is undertaking a translation; within the OED, “translation” refers simply to a “restatement” and an “exchange between different language communities.” When considering my projects, my understanding of “translate” also owes a further debt to Marjorie Perloff’s arguments in Unoriginal Genius, wherein she argues that conceptual writing is “translational” in that it requires an author to be able to balance and organize multiple languages, often transforming vocabulary, sound, concepts, from one language system into another (16-7). For Perloff, conceptual writing always employs varied languages and language systems and requires the writer and reader to move from between those multitudes, and with those movements, transform the text (across genres, languages, cultures etc).

My own work takes this as a way of thinking through the ways that all the different types of machine and human languages interact in my writing and how they transform, say, a chess game into a poem, or a poem into a physical sculpture. Scholars in modern translation often begin with Roman Jakobson’s three types of translation in “On Linguistic Aspects of Translation” (1959). Both The ChessBard and Loss Sets have very little to do with Jakobson’s translingual rewording or translation proper, and instead best fit within his concept of intersemiotic translation, wherein there is “an interpretation of verbal signs by means of signs of nonverbal sign systems” (114), which Jeremy Munday explains further as a “change in medium, such as the translation that occurs when a composer puts words to music or, more notably, when the musical sound replaces the verbal code” (6).
Looking further at Jakobson’s definitions, we should flag the word “interpretation”: it is important to note that an intersemiotic translation does not replicate but rather adjusts or re-presents a source text in some new form. With this in mind, I’ve approached my three projects with Walter Benjamin’s “The Text of the Translator” as a mantra (1923). He contends that that “a real translation is transparent; it does not cover the original, does not black its light, but allows the pure language, as though reinforced by its own medium to shine upon the original all the more fully” (18). In this “transparency,” Benjamin argues that “the task of the translator consists in finding that intended effect upon the language into which he[sic] is translating which produces an echo of the original” (19). This “echoing” and overlaying of the translated text overtop the “original,” recalls the obvious language layers in *O/Ô*, and Perloff’s layers of multiple languages and language systems within conceptual poetics. In this layering, translations, like *The ChessBard* and *Loss Sets*, do not strive for complete fidelity, which translation scholars say is impossible anyways, but rather for what Umberto Eco describes as a “poetic translation” (4), a product which he says focuses less on the exact re-creation of the language or source text and more on the “intention of the text,” an intention that focuses on the “interpretative effort on the part of the reader, the critic or the translator” (5); such transmutation showcases “the impact a translation has upon its own cultural milieu.” When considering my own work through this prism, Benjamin and Eco grant permission for the texts produced through translations to be evocative and rhetorical rather than precious and exacting, and for the reader to think about their processes as much as they consider the end product of those translations.

To return to the previous question of “Why use the word ‘translate’?”, I argue that Bolter and Grusin’s concept of remediation involves the same acknowledgment of layered and interwoven media and human and machine species that exist when producing contemporary digital documents. Still, remediation does not fully encapsulate the interpretative transition that translation projects like *Loss Sets* undertake. Likewise, Manovich’s use of “recode” has more to do with the system of language communication, one in which the computer interface mediates, recodes, the variety of forms and messages; again, like remediation, translation likely involves recoding as information is carried back and forth to the different components of the process of translation, but the act of translation is defined by its interpretative transformation whereas recoding and remediation do not to the degree that my projects are enacting.

With all this in mind, my approach to translation and my writing process as a whole, recognizes the text, author(s), and readers as a complex ecosystem in a specific place at a specific time while also acknowledging the many types of language systems interworking to produce any work. My next section expands on these notions of interworking systems to consider the potential further complications that are brought on my involving machine co-authors in my poetic translational acts.
Poetic Machine Translation: Chance and Rules

Within the contemporary western world, in order to reflect the “cultural milieu,” any act of translation must grapple with the explosion of personal computer use and the multiple languages at the hardware and software levels, even if we consider humans to be at the center of that ecosystem. More personally, I think it also important to imagine how elements of chance, computer intelligence or randomization challenge and/or human rationality in the translation process. To this end, it is important to remember that traditional “human” translators very rarely (if ever) work without computers. As Alan Melby points out in his essay “The Translator Workstation,” these computerized elements include “word processing, telecommunications, and terminology management,” as well as “automatic dictionary look ups, and synchronized bilingual text retrieval” along with “an interface” into all of those machine elements that take place on computer hardware (149). Like Google Translate, the human translator does not act alone and instead, creates collaboratively with other co-species through the process of translation; modern acts of translation are not human-centric, and involve multiple languages and species, and speakers in a cooperative effort from all components, human and machine. In terms of my own work, this finds the greatest resonance in O/Ô, where the works make obvious, with the literal layering of the translated language atop the source, what specifically the machine translation is compared to the “human written” original. The most apparent evidence of this is the way in which the machine translation appears almost pasted over top of the source text, its placement overt and disruptively intrusive; that there are often blatant mistranslations that verge on the silly, and that sometimes those translations are blurry errasures of the source text make the semantic end goals of the work secondary to the processes behind the complex translative ecosystem that it makes obvious.

Focusing on machine translational acts as core to my writing processes, I agree with Manuel Portela, who explains that electronic literature is built from “[a] series of cascading and interacting processes [that] makes human and machines part of a single system” (digitalhumanities.org). Returning to Eco, he describes his idea of poetic translation as a “negotiation” (6) and when I apply this to the cascading human-digital ecosystems in which I write, my negotiations take place everywhere I interact with a computer: at the lowest level hardware and their electronic pulses; in machine language; in assembly language; in further operating system code; in any program/software operating within that software; in the language and/or markup of the user interface (UI); in physical interface devices (mouse, keyboard etc); and finally in the language(s) of the end user. Just by using a computer in my writing process, I am undertaking a sorting of sedimentary languages that echo Perloff’s understanding of “translational” acts.
However, I also contend that involving machine elements in my writing processes also encourages further acts of “interpretation” or “imagination” in the processes of translation that are similar to the elements of chance that Marcel Duchamp and OULIPO writers sought as a mode to escape human rationality. Duchamp in particular agreed with this, explaining in an interview with Calvin Tompkins that, “[t]he duty of chance is to express what is unique and indeterminate about us beyond the rational”; Tompkins responded: “In your mind, chance is a rational expression of avoiding the control of your mind,” which Duchamp agreed with, “Absolutely” (53). Questions of “authorship” in my projects gets murky: the chance involved with the inclusion of machine authors, at the hardware and software levels, grant a great deal of “unknown” variables that destabilize the texts that I produce. While this escape is still built around algorithms that are human-designed, those algorithms are very complex. To trace each individual step of how the machine arrives at the product depends on an increasingly complex knowledge of low level software and sometimes machine and assembly languages. The “chance” involved in the failure of any of the machine parts of my writing ecosystem, to say nothing of the product that such an ecosystem produces (a poem, a model, a photograph), makes more visible the scores of “invisible” processes that machine authors undertake. This is not to say that involving machine species in a writing or translation process is chaotic. As anyone who has done any sort of markup or coding knows, computers are very precise machines that have a very low tolerance for aberrations in syntax or diction. I think, then, that there is something to be said for the rigidity of involving computer components: echoing the more deterministic Oulipo writers, the rules sets enabled by the programs involved in both projects produce stable, replicable works that are not random and able to be cleanly iterated, and largely absent of the noise that human input might generate in translation. Whether these absences of noise leads to more “accurate” translations is irrelevant: if the goal of translation is not complete fidelity, than what makes my projects unique is how the computerized aspects add multiple layers, further complicating both the source text and target text and making movements towards escaping human rationality. I would add too that the digitally networked components of my projects, in particular The ChessBard, generate a space in which the reader is uniquely empowered in the generation of the texts, and that this deeply active interaction and collaboration is only possible by involving computer components in the translation process.

Lastly, computers are unique and powerful co-authors/creators because their very function depends upon intersemiotic translation: a computer is essentially translating electronic pulses, using the aforementioned cascades of language (machine then assembly languages, for example, through to different software coding, to markup) into human-readable interfaces. A computer’s nature is to take information from one medium and re-constitute it in another and so utilizing a computer in projects like The ChessBard and Loss Sets is only natural. For myself and my work, I love these transmutations and the active ecosystem that arises, especially in how this translation generates art that is beyond the singular capabilities of its machine or human components.
THE POTENTIAL FUTURE OF MACHINE AND HUMAN CO-AUTHORSHIP

In his discussion of RACTER, one of the earliest poet-machines, Christian Bök challenges his reader: “If we want to commit an act of poetic innovation in an era of formal exhaustion, we may have to consider this heretofore unimagined, but nevertheless prohibited, option: writing poetry for inhuman readers, who do not yet exist, because such aliens, clones, or robots have not yet evolved to read it” (ubu.com). It is with this attitude that I want to end this essay. Without falling down the rabbit hole of debates around AI intelligence and whether a computer can (or will be able to) understand or think, I do think that the horizons of e-literature are filled with computer makers and readers that will be speaking to each other, without a human audience. Calvino might have called such things “literary automatons” (10), entities whose tasks “will be one that itself feels the need to produce disorder, as a reaction against its preceding production of order: a machine that will produce avant-garde work to free its circuits when they are choked by too long a production of classicism” (11). This disorder, perhaps similar to the aforementioned notion of “chance,” forces us to consider literature and creative writing by acknowledging its humanist traditions alongside a forward-looking critical posthumanism.

Poetic, intersemiotic translations in particular defamiliarize translation and writing processes from “traditional” human-exceptionalist expectations, making the intertwined processes, and their results that much more transparent and evocative. From this co-production, works like The Chess-Bard, O/Ô, and Loss Sets highlight how enacting translation as a form of writing, and then integrating machine co-authors into that process, can trouble notions of interpretation and creation as human-centric; they also ask readers to reconsider what exactly data is, what language’s relationship to data might be, and how those thoughts fit into a contemporary notion of machine translation and creative writing.

WORKS CITED


Bergvall, Caroline. Fig: (Goan Atom 2). Salt Publishing, 2005.


Tomkins, Calvin and Marcel Duchamp. Marcel Duchamp: Late Afternoon Interviews. Badlands Unlimited, 2013.


**Biography**

**Aaron Tucker** is the author of the novel *Y: Oppenheimer, Horseman of Los Alamos*, as well as two books of poetry, *Irresponsible Mediums: The Chess Games of Marcel Duchamp*, and *punch-lines*, and two scholarly cinema studies monographs, *Virtual Weaponry: The Militarized Internet in Hollywood War Films* and *Interfacing with the Internet in Popular Cinema*. His current collaborative project, Loss Sets, translates poems into sculptures which are then 3D printed (http://aarontucker.ca/3-d-poems/); he is also the co-creator of *The ChessBard*, an app that transforms chess games into poems (http://chesspoetry.com). He is an Elia Scholar in the Cinema and Media Studies Department at York University where he is studying the cinema of facial recognition software.