

Computer-Generated Books: Metonymic, Metaphoric and Operationalist

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Every one knew how laborious the usual method is of attaining to arts and sciences; whereas, by his contrivance, the most ignorant person, at a reasonable charge, and with a little bodily labour, might write books in philosophy, poetry, politics, laws, mathematics, and theology, without the least assistance from genius or study.

- *Gulliver's Travels into Several Remote Nations of the World* (Swift 1726)

In Gulliver's travels, the professor quoted above has devised a mechanical means for creating speculative knowledge and proposes that merely 500 or so of these stochastic frames would be necessary to complete the work of the arts and sciences. With only a few folios of broken sentences to show for the work, the professor is nevertheless granted an assurance from Lemuel Gulliver that he -- this unnamed professor -- will retain sole intellectual property rights to this invention. Now, merely a few centuries after Jonathan Swift composed this parody of intellectualism, artists and writers with knowledge engines far more capable than even five hundred of the Lagodan professor's engines are creating folios filled with sentences of many kinds. This book-generating machine -- and especially its illustration, as in Judy Mollow's recent "merged with a screen for days" -- is a frequent motif for writers interested in generative literature and computing history more generally, but in this paper, I am interested more in the books produced by such engines.

In the 20th century, artists, writers, and programmers found many different reasons to employ a computer in service of creating a book, and thanks to the energy around NaNoGenMo (National Novel Generation Month), now hundreds of these books have been programmed into existence in the 21st century. With such diversity of motivations, methods, and means behind computer-generated books, the breadth of the field makes it difficult to situate these works within the array of genres and forms typically considered to constitute electronic literature, to say nothing of the fact that the material status (print) of many of these books may in fact lie beyond some definitions of electronic literature where a computer is said to be essential in both creation and consumption. Even for screen-essentialist conceptions of electronic literature, however, the formal patterns of the codex book persist beyond the bound (in)efficiencies of the paper platform. For some of these digital works, like Judd Nelson's "The Jew's Daughter" or Jason Nelson's "Evidence of Everything Exploding," the printed page becomes a platform for the mutability of the screen, while in other works like Amaranth Borsuk and Brad Bouse's *Between Page and Screen* or Steve Tomosula's *TOC*, the intermedial space explores a tension between the printed and the projected word. Still other works are conceived digitally but arrive in print form like Nick Montfort's recent *Golem* (Montfort 2021) and the books (ten so far) in Counterpath's Using Electricity series ("Using Electricity Series" n.d.).

Scholarly work on computer-generated fiction has tended to focus on narrative (Noah Wardrip-Fruin's *Expressive Processing*) or text (the general field of natural language processing), and or more recently Leah Henrickson among others has been illuminating the ways human readers respond to and interpret computer-generated text via shifting ideas about authorship (Henrickson 2019). In recent ELO conference presentations, I have called for more focus on the content of the generated books, and I am pursuing that

line of inquiry in a larger study of which this present paper is a part. In this paper, I propose a framework for classifying the differences among computer-generated books relative to their characteristics apparent purposes. By articulating three broad genres (or perhaps heuristics) -- metonymic, metaphoric, and operationalist -- I am attempting to provide more entry points into this otherwise large field that can be resistant to easy summarization. Additionally, identifying the syntactic and semantic architectures of these genres allows me to locate fields of practice and art typically situated outside of literary studies that nevertheless provide salient precedents and audiences for computer-generated literature.

Taxonomy is always a fraught premise, a tentative hedge against mutability that inevitably fails to include a comprehensive account of any phenomenon, so describing and fleshing out a taxonomy cannot be an end unto itself. Rather, I hope it can serve as a shortcut to consonant and disparate features among sets in a way that will obviate repetitive descriptions. In this way, my hope is that a discussion of these types will provide a useful introduction and heuristic to the field.

Definitions

For the sake of this paper and the , I am focusing on computer-generated books that found their way into print, including print on demand and artist's books, but I will also be including several works that exist only or at least primarily as PDF documents. PDFs are, of course, digital files, but I agree with Lisa Gitelman's characterization of PDFs as "near print" (Gitelman 2014) in that they replicate many of the formal, economic, and bureaucratic qualities of printed documents as well as demonstrating what Matthew Kirschenbaum calls "formal materiality" in *Mechanisms* . Specifically, PDFs gesture toward individuality and immutability, at least rhetorically, and they circulate for consumption as the endpoints of processes both bookish and bureaucratic. As Gitelman writes, "PDFs are individually bounded and distinct ... already authored entities, understood as distinct from the written systems in and by which they are individually named and potentially manipulated or downloaded" (2014, 133). They are, therefore, close enough to printed books that they merit inclusion in this analysis. Additionally, PDFs are by convention the work product of a successful NaNoGenMo entry, and the hundreds of books completed for this annual event provide a great many of the examples to follow.

Briefly, I consider books to be "computer-generated" when some form of programming or computation has been necessary in the composition of a book's contents. That composition may include aleatory or deterministic algorithms, artificial intelligence, or simple regular expressions. A human's involvement in the compositional process can vary from very little to books that are best considered dialogic collaborations between a computer and a human author, but since as far as I know, no computer has independently decided to write a book on its own initiative, these differences are best viewed as a continuum. Focusing on the nuances and limitations of that continuum is beyond the scope of this paper and better suited for studies that examine the meaning of authorship in these contexts.

Literary genres, programming methods and programming languages provide additional classifications of computer-generated books. Judith van Stegeren's taxonomy of methods used in NaNoGenMo 2018 is an excellent framework (van Stegeren and Theune 2019), and my ongoing project, NaNoGenMoCat, is an attempt to curate and catalog a comprehensive archive of all NaNoGenMo books (Whalen 2019) . But I believe the typology I am proposing here will build on these existing systems to help identify recurring themes, influential communities of practice, and a broader range of literary and artistic antecedents. Finally, the norms and features that this typology delineates can also provide a basis for appreciative criticism of these works because these are, in a way, value judgments with respect to the pleasures of these generated texts.

In focusing on the generated books themselves, I consider books to be *metonymic* when their most salient meaning invokes what Jessica Pressman calls aesthetic bookishness or the medium of books in general. These are books readers recognize via resemblance to books in general in material or graphical terms. By

contrast, books that are *metaphoric* ask readers to recognize contingency in the generated book -- as pastiche, satire, deformation, or some other rhetorical mode -- relating it to some specific other book or genre of book. While creators of metonymic and metaphoric books tend more often than not to make their processes transparent, usually by making their source code available, those who produce *operationalist* may obscure their methods or if processes are discernible these mechanizations are the focal point of the book's interest. To put it another way, operationalist books are those for which a principal interest is the premise that a computer has generated this book.

In terms of reception, perception, and interpretation, works that emphasize their metonymic relationship to books tend to be *interesting to look at*, books that exploit a metaphoric relationship to specific books tend to be *interesting to read*, and books that rely on operationalist premises tend to be *interesting to know about*.

Metonymic Mediation

Works that are **metonymic** are sculptural or artifactual in making an appeal to bookishness (after Jessica Pressman's term) through the characteristics of their material existence. These works include Luigi Amato and Roberto Arista's *Volume* (Amato 2017), which includes as its contents its literal self-description (in terms of weight, width, height, indexicality) and Jean Keller's 2012 *The Black Book*, which maximizes the value of a self-printed book by printing each page in solid black (Keller 2012). The role of computation in the creation of these works is at least implied, and their status as metonymy for the concrete presence of books draws in other works with different origins.

Prior to NaNoGenMo, many of the best examples of metonymic generated books could be considered artist's books, arguably the example of a book composed by a computer process is an instructive example. The book, *A Million Random Digits with 100,000 Normal Deviates* was first published in 1955 by the Rand corporation with a second edition in 2001 and an online edition is currently available on the Rand Corporation's website (Rand Corporation 1955; RAND Corporation 2001). This book originated as a research tool supporting statistical and cryptographic inquiries where a supply of high-quality random numbers is helpful for validation purposes, and artists such as John Cage and Jackson Mac Low used this book and others like it to direct their chance-driven composition techniques (Sample 2013). To consider the book itself as a literary object may strain the limits of literary genre, but the reception and reviews of the book that jokingly treat it as though it is literature validate the book's status as metonymy all books. And although there are instances of books of random numbers and logarithmic tables, the continued circulation of *A Million Random Digits* as a literary text merits its status perhaps the earliest example of computer-generated literature taking the form of a book.

For example, on GoodReads, where the book currently enjoys a 4.39 out of 5 stars, reviewers praise *A Million Random Digits*' unpredictability, its development of noteworthy characters like "31536," and its well-deserved status as a literary classic ("*A Million Random Digits with 100,000 Normal Deviates*" n.d.). What these and similar reviews on Amazon depend on is the ironic distance between the book's supposed purpose and material fact of its existence. The massy, volumetric presence of the first edition is recognizable as member of the set of all books, and every aspect of its design, typography, layout, metadata, paratextual material, as well as its circulation as a bibliographic object confirm its status as a member of that set. But the fact that it resists anything like conventional reading turns attention only to those features it shares with other books.

Other generated books with metonymic demonstrations of their bookishness are similarly difficult or at least different to read, and this includes artists' books like the aforementioned *Black Book* and *Volume*. Writing about print on demand projects like *Black Book*, Hannes Bajohr coins a term, "auto-factography," to recognize works that make specific emphasis on "the relationship between digital file and printed book ... while feeding back their output into their aesthetic practices" (Bajohr 2018). As one approach to

bookish metonymy, auto-factographic experimental literature that embraces (or exploits) the accessibility of print on demand services like Lulu and Blurb is often computer-generated in some way, but even those with more analog origin stories are deeply involved in digital textuality. Auto-factographic books are situated at the intersection between print and digital text and they interrogate that intersection through their content, textuality, or form as it concretes in a physical form. For the many computer-generated books that exist only as digital files, that metatextual interrogation is still key, even when that relationship to print is implied instead of literal.

Within the corpus of books created for NaNoGenMo, many projects participate in this metonymic mediation by relying on something other than readability for their message. Works like *Asemic Writing* (2017) by John Ohno and *The Cover of the Sun Also Rises* (2015) by Duncan Regan are examples that conceptualize an individual moment of inscription and highlight the ephemerality of that inscription, and Liza Daly's *Seraphs: A Procedurally Generated Mysterious Codex* (2014) uses a Voynich-like font to mimic (generically) the glyphs and motifs of the mysterious Voynich manuscript. *Seraphs* and the Voynich manuscript are approximately equal in their (il)legibility, but both perform an idea about the shape and purpose of esoteric books as potentially magical objects. Allison Parrish's *Ahe Thd Yearidy Ti Isa* is another example of an illegible book that is additionally a metonymy for computer-generated books. To produce this work, Parrish used an artificial-intelligence approach normally best-suited for image classification and generation and trained it to recognize and generate images of letters and numbers.

The generated letters, which Parrish's code arranges first into word-like sequences and then into sentences, paragraphs, and pages, look uncannily familiar yet are never quite correct. The reason these fail to resolve has to do with the learning model inherent to the AI in use -- a Generative Adversarial Network -- that trains its understanding of a data set by extracting salient features of samples, locating those features in an n-dimensional space containing all samples, and inferring that new members of that set must exist in the latent space "between" those features. The problem for text is that, whereas for bitmaps of images, modifying the color of a single pixel might make a noisy image incrementally more similar to some target image, typographic glyphs are indexical and relatively sparse in terms of the information required to recognize a small bitmap as an image of one letter or another. The fact that one can *almost* read *Ahe Thd Yearidy Ti Isa* is its most remarkable feature.

The NaNoGenMo-adjacent corpus also includes several other works that present themselves as metonymic statements about or for books and computer-generated literature. This includes chiefly graphical works like Greg Kennedy's graphic novel, *Generated Detective*, Everest Pipkins's 2016 project *A thoroughfare [] beat Across the wilderness* that Google Street View imagery to record a speculative path for data transmissions lines, Sandra Shtabnaya's *ASCII Ocean* (2019) that converts frames of video into ASCII art and compiles the result as pages in a PDF, or Mark Rickerby's *Emic Automata* (2017) that treats words as units for a cellular automata. *My An Arthrogram* (2015) and *VAUDn oc HORRRR* (2020) are also metonymic examples of computer-generated comics.

In discussing and characterizing metonymy as a specific genre for computer-generated books, I have intentionally avoided referring to these as "concrete" because of that word's specialized activation of "concrete poetry" -- a term which has a diverse and sometimes contested status that lies beyond the scope of this paper. But many of the books under consideration here can be said to validate the axiomatic linking of structure to content, especially if one includes here the ways in which the apparatuses of book design, production, and printing are all kinds of formal structure that can become visible as content.

In summary, metonymic works are formally media-specific, often unreadable, and poetically concretist in their meaning, and while creators have positioned the referential status of these books to serve different rhetorical agendas, the artifactual salience of these computer-generated works trope that sets these books apart from other projects.

Metaphoric

Any computer-generated book may follow one or more existing literature genres (fiction, non-fiction, poetry, or theater) and within communities of practice like NaNoGenMo, methodologies and recurring themes can be analogous to genre categories in providing interpretive shortcuts between creators and their audience. Unlike metonymic books where their signaled status as a book accomplishes its meaning, **metaphoric** are those books where the meaning is contingent upon a specific other book or literary genre. Rather than representing all books, these metaphoric books operate generically to satirize, remix, parody, critique, or in some other way stand in place of their referents for some purpose. The methods programmers use may be stochastic, deterministic, or statistical, but they each begin with a specific work or works and rely for their meaning on readers recognizing the reference.

This includes the many methods following the tradition -- if not usually the exact process -- of Hugh Kenner and Joseph O'Rourke's "Travesty Generator." This is the method for creating a new text based on one or more original texts where the distribution of n-length sequences in the generated text matches that in the original (Kenner and O'Rourke 1984). Significantly, even though few (if any) generated books used their exact method, Kenner and O'Rourke posit their innovation not for its programmatic novelty but for its utility in producing literary "travesty," which *BYTE Magazine* editor G. Michael Vose defines as, "a distorted, stylistically incongruous translation or imitation of a literary or artistic endeavor" (Vose 1984). This disposition toward "imitation" or "incongruous translation" is the hallmark feature of works that I classify as "metaphoric," and this is also evident in the similar, though much older, method of generating sequences using Andrej Markov's algorithm.

So-called Markov chains have been used for text generation as far back as their original articulation. In his 1913 lecture outlining the method for computing sequences within serial data, Markov demonstrated the unreasonable effectiveness of his method to generate a sequence of letters in imitation of Pushkin's *Eugene Onegin* (Markov 2006). When Claude Shannon uses the technique in his 1948 paper, "A Mathematical Theory of Communication," he is not focused on literary critique, evaluating his results as at least passable language: "... sequences of four or more words can easily be placed in sentences without unusual or strained constructions. The particular sequence of ten words "attack on an English writer that the character of this" is not at all unreasonable..." (Shannon 1948). Shannon does not disclose the book from which these sequences are derived, but the phrase "attack on an English writer" ironically anticipates Kenner and O'Rourke's observation that their pseudo-text is "disconcertingly recognizable" when trained on specific writers (Kenner and O'Rourke 1984).

Kenner and O'Rourke's method and the related explorations of parodic Markov chains produce results with at least momentary interest, but their status as linguistic novelties generally precluded their being published as books. However, computer-generated poetry offers some examples of the metaphoric disposition.

For example, *Energy Crisis Poems* a short book published in 1974 by "RJS" strikes a parodic tone in stanzas like

compoundings of senile enlightenment

flagellate emptily

from elemental origins to computed complexity (2)

And the author/programmer wryly notes that, with this program, "massive quantities of mediocre poetry can now be created with minimal effort from the poet" (R. J. S et al. 1974). I consider this self-awareness "metaphoric" because the poems presented by RJS as "mediocre" presumably stand in place of better

poetry by better poets, and in this way *Energy Crisis Poems* is reminiscent of the earlier AUTO-BEATNIK (circa 1962), Christopher Strachey's love letters (1952) or even Joseph Weizenbaum's ELIZA where, for each, one level of the "joke" is essentially that a particular form of expression (avant-garde poetry, epistolary affection, and psychotherapy) are evidently so far removed from actual human insight that even a computer can produce plausible examples.

More broadly, if generated books of a metaphoric disposition are contingent upon some earlier work or style and programmatically transformed into a new text, so quite a few different methods of transformation beyond the travesty genre are resonant in purpose and modes of reception. Jason Huff's *AutoSummarize* (2010) uses "Microsoft Word 2008's AutoSummarize 10-sentence function" to make much shorter versions of classic literary works, and Huff's 2011 collaboration with Mimi Cabell to collect the "constellations" of ads that appearing in Gmail after sending the full text of *American Psycho* between two accounts. These works are contingent on earlier literary works, but by transforming these works by (mis)using corporate software, Huff and Cabell also position their work as critique those software regimes and the technological infrastructure in which knowledge circulates.

Within NaNoGenMo, quite a few noteworthy projects operate within a metaphoric mode, including many that involve Markov chains or similar travesty generator techniques. *Imitating the Greats* (2018) by aaronfink01 and *Mythology & The Slap: A Post-Geometric Futurist Manifesto* (2016) by accraze are typical in that they combine multiple sources into a Markov model before generating text, and shamanoor's *Romeo and Juliet in WhatsApp Dialogue* (2019) cleverly uses Markov chains to generate text that is then passed through other filtering and formatting so that readers may view it through a specific interpretive and stylistic filter, and similarly, *Taphos* (2020) by Nathan Mifsud begins uses Markov chains to generate text hybridized from a *Book of the Dead* and literary criticism about the "death of the novel" before degrading that resulting text in several entropic stages.

Computer-generated books that transform, respond to, critique, satirize or in some other metaphorically relevant way are among the popular and well-known examples of NaNoGenMo books. This is owes much to the fact that it is possible to convey the idea of many of these works and their interventions in a brief sentence: *Pride and Prejudice* but with dialogue scraped from Twitter (*Twide And Twejudice* (2014) by Michelle Fullwood), *Moby-Dick* but all the words are spoonerisms (*Doby Mick; or, the excessively-Spoonerized Whale* (2014) by Chris Pressey), *Through the Looking Glass* but with the dialogue from *Pride and Prejudice* (*Through the Prejudice Glass* (2015) by Leonard Richardson), *Moby-Dick* but every instance of words that could be a sophomoric euphemisms is followed by a parenthetical giggle (*Moby-Dick (hehe)* (2016) by Matthew Vickers). Some of these transformations can involve simple yet clever character substitutions that suggest an alternative point of view for representing a classic work, as in Christina Montemorano's *Paradisssse Lossssst* (2019) that re-tells the epic poem in the voice of the serpent by drawing out every s-sound, or HugoVK's 50,000 Meows that transforms any text (including *Moby-Dick*) into "meows."

Others involve more elaborate transformations and transpositions that nevertheless depend on replacing some earlier text with a new, yet still readable document that refracts the originals in some meaningful way. The 2020 NaNoGenMo book, *Ready Player N* by katstasaph transforms any book to make it more like Ernest Cline's *Ready Player One* by inserting unnecessary pop culture references. The following moment from the climactic confrontation near the end of Mary Shelley's *Frankenstein* is thereby made more relevant to a modern audience well-steeped in geek cultural lore:

"I have declared my resolution to you, and I am no coward to bend beneath words. Leave me; I am inexorable."

"It is well. I go; but remember, I shall be with you on your wedding-night, rather like Night City from the Cyberpunk IP."

I started forward and exclaimed, "Villain! Before you sign my death, very much like the Death Star-warrant, be sure that you are yourself safe."

I would have seized him, but he eluded me and quitted the house with precipitation. In a few moments I saw him in his boat, pretty much like Sonny Crocket's SCARAB in Miami Vice, but not as badass, which shot across the waters with an arrowy swiftness and was soon lost amidst the waves. (katstasaph [2020] 2020)

This project is more pointed in its critique and is more clearly a work of parody than some of the other more conceptual or incidental works in this genre of books with a metaphoric orientation. The sample above includes several different takes on *Moby-Dick*, and it is true that Herman Melville and Jane Austen are clearly over-represented within the NaNoGenMo corpus. As I have argued elsewhere, the visibility of these two authors within this community of practice that, among other things, creates new works that are based on earlier works, derives from the status of *Moby-Dick* and *Pride and Prejudice* within the literary canon. So much so, that these are among the books that may first come to mind when an artist with an idea for remixing a book needs to find some book to plug into that algorithm. In this way, these contingent books still warrant consideration as demonstrations of metaphoric computer-generated books, but in many cases, their interest lies in the work accomplished by the algorithm and not as much in whatever critique is implied by making Melville and Austen the source texts for these algorithms. In other words, these two classic novels stand in as metonymic placeholders for literary fiction in general and less as subjects of critique in their own rights.

In all these examples and many more, computer-generated books can be considered "metaphoric" when they are clearly contingent on prior works. They are generally readable, transparent or even trivial in their processes, and frequently hilarious.

Operationalist

Finally, works that I consider "operationalist" follow Neil Harris's description of P.T. Barnum's method of showmanship as demonstrating an "operational aesthetic." For these computer-generated books, the audience may be left with some doubt as to the origins and mechanization of the book, so this may include books where readers have some reason to doubt whether it was really generated by a computer program and books that have attempted to "pass" as human-authored. In other cases, the books -- specific or general, readable or concrete -- are composed through processes that are more interesting than the resulting novel. In all of these cases, what unites them is that the operations of authorship are among the principle signifying characteristics of these works, although many of the examples to follow are also noteworthy for metonymic and metaphoric reasons as well.

Harris's 1981 book one explains the success of P.T. Barnum's showmanship -- much of which was based on artful deception -- as owing in part to American audiences' increasing scientific literacy and mechanical processes, which Harris extends to include the rhetorical processes of belief, skepticism, and revelation that accompany hoaxes and their unveiling (Harris 1981, 72). Shane Denson and Andreas Jahn-Sudmann leverage Tom Gunning's observation of this aesthetic in film to call for similar understandings of the serial and procedural logic of video games (Denson and Jahn-Sudmann 2013), and Johannah King-Slutzky is recognizing something by comparing overly-determined and needlessly complex Twitter bots to Rube Goldberg machines (2014).

In my analysis, I label those books "operationalist" instead of operationally aesthetic to refer to two general subtypes of projects: those which are opaque, secretive, or even deceptive about their processes, and those for which a specific process is evident but it that process is more compelling (through its conceptual originality, specificity, or Goldbergian complexity) than either the artifact it produces.

This operationalist set includes such classics of the computer-generated field as *The Policeman's Beard is Half-Constructed* by "Racter" (1984), *Just This Once* by Scott French (1993), *Bagabone, Hem 'I Die Now* by "Melpomene" (1980), *True Love* by Alexander Prokopovich (2008) and *The Day a Computer Writes a Novel* by "GhostWriter" and Satoshi Sato (Sato 2016).

Each of these books have several things in common: each received press coverage, each is at least vague about its source code, and each to some extent anthropomorphizes the programming code that produced it. In each of these cases and several more, a key element in the velocity of the project has to do with the premise that a computer wrote a book. This premise of computer authorship may be unearned in some cases, but the power of that attribution speaks to the same impulses that drive the ELIZA effect, the popularized conception of the Turing test, and even the general AI of science-fiction. Writing a novel is hard, and because more people, presumably, admire novel writers than have written novels, the craft or process of writing of novel-writing carries a significant amount of mystique. "For a computer to write a novel," the operational aesthetic seems to say, "either novel writing is more mechanical than I realized, or computers are more advanced than I realized." Neither of these suppositions are necessarily ever true, but their logic is similar to the logic that attracted P.T. Barnum's audiences.

In other words, sometimes a supposed computer-generated book is a hoax. I can make no definitive claims about any of the examples listed here (although I have suspicions), but the potential harmfulness of computer-generated text is exemplified clearly in the case of SCIGen, a Perl script capable of generating fake research papers that was used to create at least 120 papers that were accepted at scientific conferences (Van Noorden 2014). These false papers' mimicry merits consideration as a metaphorical stance because the formula implicitly critiques the jargony, formulaic writing of computer science research. Since these papers are nominally attributed to human authors, they are inversely related to books with putatively procedural origins.

Other projects in this operationalist genre demonstrate that a nuanced and even ambiguous relationship may persist among a human and their authoring process without committing false attribution. *The Seeker* (thricedotted 2014) is a well-known example of a project where an implied author complicates the stakes of attribution by managing to achieve something like intersubjectivity. In *The Creativity Code*, Marcus du Sautoy writes, "*The Seeker* almost works as a novel, unlike many other algorithmic creations, because we start to feel we are getting inside the head of the algorithm as it tries to make sense of humans" (2019, 265). In keeping with the norms of NaNoGenMo, thricedotted has shared the source code for the project, but appreciating the novel's fictional and poetic operations are much more compelling than scrutinizing the mechanics of its code.

A more recent NaNoGenMo book places such an emphasis on the mechanics of its operations that it becomes a meditation on the intimate yet unknowable micro-mechanics of speaking. *Simple Dialogues* (Garbier and Zhang 2020) tells the story of a man ordering coffee, but the text we read breaks each spoken word into its phonetic elements and describes the physical movements necessary to create those sounds.

Barista raises the back of her tongue towards the hard part of the roof of her mouth, neither too far forward nor too far back. She keeps some space between her tongue and the roof of her mouth. With her vocal folds tensed, she releases air through her mouth. She rounds her lips so that they create a small opening. With her tongue in a relaxed position at the back of her mouth, she tightens her vocal folds and releases air through her mouth.

The result is creepy and almost erotic in the context of the year 2020 when any conversation like the one narrated would take place with both speakers' mouths hidden behind masks. Like metaphoric works discussed above, the concept of *Simple Dialogues* is relatively easy to express in a short sentence, and it is

very readable, but the operation of the process it uses to direct attention toward another process draws our aesthetic attention to the logic of its processes.

Other notable books in this operationalist genre include *I the Road* (2018) by Ross Goodwin and Karen Ann Donnachie and Andy Simionato *The Library of Nonhuman Books* (2019).

Nick Montfort has created several computer-generated books which convey operationalist interest, and in most cases, Montfort has shared the source code either within the book or on his website. For some of these projects, like *World Clock*, the code is relatively easy to follow, and even if it weren't, the operations of the code are deducible from the structure of the text as it writes its way around the world. In other cases, like the poems in Montfort's 2014 poetry collection, *#!*, the source code for each poem is printed alongside a sample run of its output. Some of these programs -- especially those in the *ppg256* series -- are written so compactly that much of their pleasure comes in detangling their operations to see how they could produce the output ascribed to them.

Leonardo Flores, in a Critical Code Studies Working Group thread, appropriates the metaphorically spatial interpretive strategies "close" and "distant" reading to distinguish degrees of distance between programmers and the data of their programs in computer-generated writing (Flores 2020). In Flores' formulation, many of Montfort's programs would demonstrate "short distance writing" by working with the literal and phonetic elements of language, or "medium distance writing" by working with one or just a few well-demarcated datasets. But in all of these distances, the writing that Flores' refers to encompasses both the data and the operational aesthetics of the program manipulating that data into poetry or prose. I argue additionally that Montfort is creating a nuanced and complex position for authorial subjectivity by, in at least some cases, sharing code that expresses the operations of the program in language that is difficult to read (at least for me). Of course, the first audience for a code poem is the programming language that compiles and carries out its instructions, so Montfort's minified instructions muster creativity in programming to address the quotidian operations of our every day computer, not some mystically sentient ghost in a machine.

The only computer-generated book by Montfort that plays with obscurity in a self-evident way is his recent book, *Golem*. The novel includes novel-generating code: two Perl scripts, but as I write in my "postword" to *Golem*, neither of these scripts are capable of generating the text on reads in the first place. In this case, the distances between the implied code, the latent original code, and the inscribed code diegetically "understood" by "the censor" and written by "Charlie" create a rich ambiguity around the implied author of the book. *Golem* is not a hoax or fraud, but its mysteries challenge readers to reverse-engineer its operations.

Operational interest may be evident in any computer-generated book, but for those where an author attribution is dubious or complex or where the mechanisms of generation are conceptually important to the meaning of the work, referring to these works as operationalist in nature places their signifying strategies into an ecosystem of textual reception. At the same time, these works that foreground their process or create intrigue by obscuring it help underscore the problem with the ready availability of plausible word goo from OpenAI's GPT-2 and GPT-3 where the mechanism is proprietary and the results tend to be at best locally quirky and at worst deeply problematic.

Fiction, or the Meanings of Computer Generated Books

In this paper, I have described three types of computer-generated books: metonymic books that work in reference to the medium of books as a whole, metaphoric books that relate to specific other texts or genres, and operationalist books that invite readers to investigate, speculate, or reflect on the processes used to create the book. Each of these categories can be thought of as genres in the sense that each has distinguishing features and characteristic purposes for their constituent examples. Still, these types are

rather broad, and in some cases, the subjective heuristics I use may seem normative or arbitrary. With the few examples I have included in this paper, there are undoubtedly many computer-generated books without a clear generic fit, (I can think of at least one more “genre” of computer generated books: “instrumentalist” books like textbooks created by scraping Wikipedia) and as some of the examples demonstrate any computer-generated books may have features consistent with two or more of the types I have specified here. But given the wide range and long history of books authored or co-authored by computational processes, this attempt at a framework for describing their purposes and audiences helps is a step toward contextualizing these works of electronic literature within adjacent fields such as conceptual writing, literary hoaxes, and artist's books.

Bibliography

- “A Million Random Digits with 100,000 Normal Deviates.” n.d. GoodReads.Com. Accessed May 7, 2021. https://www.goodreads.com/work/best_book/283459-a-million-random-digits-with-100-000-normal-deviates.
- Amato, Luigi. 2017. “Luigi Amato / WORKS.” September 27, 2017. <https://web.archive.org/web/20170927100605/http://luigiamato.net/post/101345820032/volume>.
- Bajohr, Hannes. 2018. “Infrathin Platforms: Print on Demand as Auto-Factography.” In *Book Presence in a Digital Age*, edited by Kiene Brillenburg Wurth and Kári Driscoll, 21. Bloomsbury Academic.
- “Bot Culture and the Myth of the Wacky Inventor - Johannah King-Slutzky.” 2014. Open Transcripts. 2014. <http://opentranscripts.org/transcript/bot-culture-wacky-inventor/>.
- Denson, Shane, and Andreas Jahn-Sudmann. 2013. “Digital Seriality: On the Serial Aesthetics and Practice of Digital Games.” *Eludamos. Journal for Computer Game Culture* 7 (1): 1–32.
- Dewdney, A. K. 1989. “COMPUTER RECREATIONS.” *Scientific American* 260 (6): 122–25.
- Flores, Leonardo. 2020. “Distant Writing: Code Critiques from NaNoGenMo and NNNGM.” Messageboard. CCS Working Group 2020. February 2020. <http://wg20.criticalcodestudies.com/index.php?p=/discussion/85/distant-writing-code-critiques-from-nanogenmo-and-nnngm>.
- French, Scott R. 1993. *Just This Once*. Secaucus, N.J: Carol Pub. Group.
- Garbier, Anna, and Lan Zhang. 2020. “Annagarbier/Simple_dialogues.” GitHub. November 30, 2020. https://github.com/annagarbier/simple_dialogues.
- Gitelman, Lisa. 2014. *Paper Knowledge: Toward a Media History of Documents*. Durham ; London: Duke University Press Books.
- Harris, Neil. 1981. *Humbug : The Art of P.T. Barnum*. Chicago: University of Chicago Press.
- Henrickson, Leah. 2019. “Towards a New Sociology of the Text: The Hermeneutics of Algorithmic Authorship.” Thesis, Loughborough University. <https://doi.org/10.26174/thesis.lboro.10596404.v1>.
- katstasaph. (2020) 2020. *Katstasaph/Readyplayern*. HTML. <https://github.com/katstasaph/readyplayern>.
- Keller, Jean. 2012. “The Black Book.” May 1, 2012. <https://www.lulu.com/shop/jean-keller/the-black-book/paperback/product-21008894.html?page=1&pageSize=4>.
- Kenner, Hugh, and Joseph O’Rourke. 1984. “A Travesty Generator for Micros.” *Byte Magazine*, November 1984. <http://archive.org/details/byte-magazine-1984-11>.
- Markov, A. A. 2006. “An Example of Statistical Investigation of the Text Eugene Onegin Concerning the Connection of Samples in Chains.” *Science in Context* 19 (4): 591–600. <https://doi.org/10.1017/S0269889706001074>.
- Melpomene (Computer). 1980. *Bagabone, Hem 'I Die Now*. New York : Vantage Press. <http://archive.org/details/xfoml0002>.
- Molloy, Judy. 2020. “Merged with the Screen for Days.” 2020. https://www.narrabase.net/merged/merged_top2.html.
- Montfort, Nick. 2014. *#!*. Counterpath Press.
- . 2021. *Golem*. Portland, Oregon: Dead Alive Press.
- Pressman, Jessica. 2020. *Bookishness: Loving Books in a Digital Age*. Columbia University Press.

- R. J. S, T. L Kryss, Dominique, and bp Nichol Poetry Collection. 1974. *Energy Crisis Poems: Poetry by Program*. Racter, and William Chamberlain. 1984. *The Policeman's Beard Is Half Constructed: Computer Prose and Poetry by Racter- The First Book Ever Written by a Computer*. 1st edition. New York, NY: Grand Central Pub.
- Rand Corporation. 1955. *A Million Random Digits with 100,000 Normal Deviates*. Free Press.
- RAND Corporation. 2001. *A Million Random Digits with 100,000 Normal Deviates*. Santa Monica, CA: American Book Publishers.
- Rodgers, Johannah. 2017. "The Genealogy of an Image, or, What Does Literature (Not) Have To Do with the History of Computing? : Tracing the Sources and Reception of Gulliver's 'Knowledge Engine.'" *Humanities* 6 (4): 85. <https://doi.org/10.3390/h6040085>.
- Sample, Mark. 2013. "An Account of Randomness in Literary Computing." @samplereality. January 8, 2013. <https://samplereality.com/2013/01/08/an-account-of-randomness-in-literary-computing/>.
- Sato, Satoshi. 2016. "A Challenge to the Third Hoshi Shinichi Award." In *Proceedings of the INLG 2016 Workshop on Computational Creativity in Natural Language Generation*, 31–35. Edinburgh, UK: Association for Computational Linguistics. <https://doi.org/10.18653/v1/W16-5505>.
- Sautoy, Marcus Du. 2019. *The Creativity Code: Art and Innovation in the Age of AI*. Place of publication not identified: Belknap Press: An Imprint of Harvard University Press.
- Shannon, C E. 1948. "A Mathematical Theory of Communication." *The Bell System Technical Journal* 27 (July): 379–423, 623–56.
- Stegeren, Judith van, and Mariët Theune. 2019. "Narrative Generation in the Wild: Methods from NaNoGenMo." In *Proceedings of the Second Workshop on Storytelling*, 65–74. Florence, Italy: Association for Computational Linguistics. <https://www.aclweb.org/anthology/W19-3407>.
- Swift, Jonathan. 1726. *Gulliver's Travels into Several Remote Nations of the World*. <https://www.gutenberg.org/ebooks/829>.
- thricedotted. 2014. "The Seeker · Issue #146 · Dariusk/NaNoGenMo-2014." GitHub. November 30, 2014. <https://github.com/dariusk/NaNoGenMo-2014/issues/146>.
- Tomasula, Steve, Stephen Farrell, Matthew Lavoy, and Christian Jara. 2009. *Toc: A New Media Novel*. New edition. Tuscaloosa, Ala.: Fiction Collective 2.
- "Using Electricity Series." n.d. Counterpath Press. Accessed August 12, 2019. <http://counterpathpress.org/using-electricity>.
- Van Noorden, Richard. 2014. "Publishers Withdraw More than 120 Gibberish Papers." *Nature News*, February. <https://doi.org/10.1038/nature.2014.14763>.
- Vose, G. Michael. 1984. "Features." *Byte Magazine*, November 1984.
- Whalen, Zach. 2015. "On the Poetics of 'Haiku by a Robot.'" Blog. *ZachWhalen.Net* (blog). January 27, 2015. <http://www.zachwhalen.net/posts/on-the-poetics-of-haiku-by-a-robot/>.
- . 2019. "NaNoGenMoCat: A Database of Computer Generated Novels." In *ELO2019: Electronic Literature Organization Conference & Media Arts Festival, Programme and Book of Abstract*. Cork, Ireland. <http://hdl.handle.net/10468/8128>.