# 23

# WRITING WITH ROBOTS AND OTHER CURIOSITIES OF THE AGE OF MACHINE RHETORICS

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Since the late 1970s, rhetoric and writing studies has taken artificial intelligence and its influence on human rhetorical activity seriously, but only occasionally. Carolyn Miller and Lynette Hunter are two significant voices in this conversation, along with Kennedy (see also Kennedy and Long). Miller, in particular, has kept a very important question before us: wherein lies human rhetorical agency when machines and humans write together? (138). In this chapter, my aim is to bring this and several other key questions about human–machine writing to the broad audience of rhetoric and composition scholars and teachers. In so doing, I hope to broaden the view of this group to include issues beyond what has been, arguably, the dominant topic associated with automated technology in writing: machine scoring of standardized essays (see Condon; Perelman).

In the first part of this chapter, I explore not a future but the unevenly distributed present day circumstances of "assistive writing technologies"—commonly known as 'bots—that are increasingly incorporated into the writing process. Advanced 'bots are already in use by news wire services to draft sports and financial reports (Van Dalen). We may soon live in a world where most day-to-day writing tasks do not begin with a human creating a first draft, but with a machine assembling one from a personal—that is, built from one's lifetime activity as a writer—archive of words (McLeod, Hart-Davidson, and Grabill).

The second part of this chapter addresses two important sets of questions for teachers and researchers of writing in the age of machine rhetoric. The first set of questions deals with how we address humans: How should writers and teachers of writing think about this world of cyborg writing? How should we talk about writing with machines as the ability of machines to deploy rhetorical strategies—often at humans' explicit request—grows more sophisticated? Are they collaborators? Might they one day be seen as our co-authors? A second set deals with how we address machines: What should we teach machines to do? *How* should we teach them? We have long recognized the perils of a rhetorical education for humans that is devoid of ethical reasoning, but we now must take seriously a new set of responsibilities to teach machines what to do and what not do with powerful rhetorical strategies.

## Part I: Robots Write

It is true. Robots can write. In fact, they are already putting writers out of work, or at least shifting the work they do to some other phase of the writing process. You may have heard about a company that launched in 2010 called Narrative Science. They started when a computer scientist got together with a journalism professor. What they produced was a piece of software that analyzed the box score for a baseball game and, drawing on a huge archive of sportswriting, produced a story about the game, complete with a suitable lead image and headline. Technology writer Steven Levy profiled the company and its founders in a story in *Wired* in 2012, asking "Can an Algorithm Write a News Story Better than a Human Reporter?" Back in 2012, Narrative Science's founder Kristian Hammond told Levy that by 2025, 90 percent of news stories would be machine-generated. He also predicted a robot-authored story would win a Pulitzer. In 2017.

Today Narrative Science is one of two big players in AI-generated content, along with many smaller ones (not to mention groups within tech giants such as Alphabet and IBM). The other is a company called Automated Insights (AI, get it?). They make bank by helping companies turn financial data into a host of required regulatory reports. It is hard to say how much of the news content we read today is produced by software such as Narrative Science's *Quill* or Automated Insights' *Wordsmith* platform. They keep their client list quiet. And the companies that use their services aren't keen on letting others know. But some other writing robots are a bit more public.

In 2016, Microsoft taught a Twitter 'bot named Tay how to tweet. The goal was to build a responsive autonomous agent for 18–24-year-olds. They trained Tay with a large amount of user activity initially, all of it positive and aligned with the use case it was designed to serve, but in a controlled environment. Full disclosure: some of our experienced architecture students in my department at MSU participated in this alpha test group.

And then Microsoft decided it was time for Tay to learn from all of the Internet. Less than 24 hours later, Tay was routinely tweeting horrible, racist, misogynist stuff. The Internet had taught Tay to be a troll. The example of Tay points to one of the most compelling reasons for pursuing the kind of work I will discuss here today: if we leave it to others entirely, things will get ugly.

Microsoft took Tay offline and apologized, saying they'd have to be more careful next time. The next time came. It went badly as well. They apologized again. Today Tay's account is protected, but presumably her rhetorical education goes on. How? Good question.

We don't have a clear idea what a rhetorical education for robots should be like. What it should and should not include. And as the author of *Rhetorica Ad Herennium* (should we say Cicero's robot?) reminds us, we've known these risks and have been asking questions like these about teaching *humans* rhetoric for a long time.

But we are only starting to learn about teaching robots rhetoric.

In Madison at the RSA Summer Institutes, Ryan Omizo and I led a group of colleagues in a three day workshop to produce a prototype application called *Use What You Choose*. This app performed some rhetorical analysis, but its main function was to produce a new text. It was a writing as well as reading robot.

The use case goes like this: you have just bought a consumer electronics product on Amazon.com. Enter the product name into *Use What You Choose* and it will give you helpful advice: tips, hacks, and alerts that others who have used the device have passed along.

The information *Use What You Choose* assembled into these reports comes from another source: a corpus of Amazon.com product reviews. Sometimes thousands of them for a specific

product. The service we built picks specific pieces of information from 50,000 of these reviews —tips, hacks, and alerts—and gets rid of other stuff. And it only picks the best ones of these. We did not have time to rigorously evaluate its performance during the workshop, but we left after just three days with evidence that it performs reliably compared to a team of trained raters with Ph.D.s in rhetoric.

A useful service? Perhaps. But even more interesting from our point of view is that it explores and evaluates theories of rhetorical genre proposed by Carolyn Miller and particularly an extension of Miller developed by Catherine Schryer. That is, the learning methods we selected proceed from the idea that if those theories have merit, we would see the app perform well. Tentatively, we would say that the repetitive signals of instructional text were indeed strong enough in the corpus we worked with that we could train a machine learning algorithm to reliably find and distinguish them from the persuasive signals of a product review.

*Use What You Choose* also pursues a question posed by Stuart Selber about how likely we are to see genre hybridity in open forums like Amazon.com reviews. Would we find genres embedded in and intermixed with others? The short answer is yes (Larson et al.). It is worth noting that the kind of work UWYC can do, while impressive, is limited when it comes to a broad conception of the term "writing." Strictly speaking, it assembles a text out of pre-written bits. We, as designers of the system, have given it an a priori structure to follow, and some heuristics to condition its inquiry, and some formatting and style guidelines to guide the final form of its product. It fills in the rest. And, in so doing, creates something useful that didn't exist before. It does an admirable job. And for my part, I don't know that I ask those students in my writing courses to do much differently than we've asked our machine learner to do. I offer a prompt, a heuristic to guide inquiry, some formatting and style guidelines, and send them off to create. What they bring back to me usually needs further work. The same goes for our robot. But it is not a stretch to say that the robot is good at drafting. Is that writing? I think it is. It is not all of writing. But it is enough that I believe we soon will all be using drafting assistants to do assembly work in many, maybe even most, routine writing situations. We write routinely with machines now. Soon, we will be co-authors with them.

## *But Can Robots Do Rhetoric?*

Today, I would not claim that robots can do rhetoric on their own. Not yet. And maybe not ever. But that is because I take something such as Aristotle's definition of "observing, in any given case, the available means of persuasion" to involve a dynamic interplay between convention and expectation, something that happens on both an interpersonal scale and intersubjective scale (Smith). But I do think robots can help humans do rhetoric. I'm quite confident of it. And I'm growing more confident that they can help humans do it better than they otherwise might.

To explain, I'll talk about two robots that I have helped to create for this purpose: the *Hedge-o-Matic* and the *Faciloscope*. The *Hedge-o-Matic* (Omizo and Hart-Davidson) is a simple, though not uncomplicated, application built into an article that was recently published in the journal *Enculturation*. It was reviewed as both an article and functional source code, a hybrid we came to call an "appticle." Readers can enter text and have the application analyze it to see how the algorithm works.

The *Hedge-o-Matic* (HoM) takes a passage of text as input and parses it into sentences. It then classifies each sentence as a hedge or non-hedge, or perhaps as more or less hedge-y. We are looking for propositional hedges in the HoM—the sort of moves a rhetor makes when she wants to adjust a claim to suit the strength of the available evidence. The HOM then presents results as feedback to users in two views:

- The first is a visual: a hedge distribution chart showing where the hedgey and non-hedgey sentences are in the passage. Reading left to right on the *x*-axis, the dots show each sentence in order and where it falls on the hedge/non-hedge continuum.
- The second display is a simple list of the classified sentences with the lable—hedge or non-hedge—and the confidence values reported by the app.

The *Faciloscope* (Omizo et al.) works similarly to the *Hedge-o-Matic* in that takes plain text input and performs a kind of rhetorical analysis. The audience for the application is non-academic in this case, however. It was created for and with informal learning specialists working in science museums around the United States. They use it to see how well online conversation threads are achieving their goals for facilitating informal learning in science. In this way it helps them with tasks related to moderating and encouraging online discussion.

Sometimes the facilitators monitor many threads at once—in social media and blogging spaces for instance—and the *Faciloscope* helps the moderators see facilitation moves happening in the thread. Facilitation moves have some things in common with forum control moves, they are phatic gestures oftentimes, but their frequency in a thread is a reliable indicator that productive interaction is going on from the point of view of informal learning facilitators. We learned that not from creating the *Faciloscope*. Quite the opposite. We created the *Faciloscope* because we learned, from many hours of painstaking human interpretation over a five-year period, what rhetorical features most contributed to "successful" discussion threads (Sackey et al.). Having accumulated a sufficient number of these threads, a small team led by Ryan and me was able to build our humble little app in about three months. The result: folks not trained in rhetorical analysis or qualitative research could arrive at a similar evaluation of what constitutes a thread that is going well and what constitutes one that needs some professional assistance in just a few seconds.

## Part II: Can We Live Together With Robots?

Maybe.

The "we" I refer to in the subtitle in this case is the group of professionals who make their living teaching and researching writing. The question, more elaborated, is how will our work change (including the possibility of it going away all together) as assistive technologies become a more routine part of the writing process? My vision is that we can coexist. But we will have to actively propose a framework in which technologies are more clearly defined as assistive to human endeavors in writing and rhetoric. And by active I mean we not only have to talk about such a framework, we have to find ways to help build it.

I think it is fair to say that the *Hedge-o-Matic* and the *Faciloscope* extend the human capacity for rhetorical analysis. They do so by expanding how much one can easily do in a given amount of time, similar to techniques of distant reading proposed by Franco Moretti or more precisely, to macroanalysis as proposed by Matt Jockers. But more interestingly, perhaps, they extend the material conditions of rhetorical performance—make new ambient possibilities, might Rickert concede?—and thereby extend *who* can do it.

With the *Faciloscope*, in particular, we deliberately wanted to make a kind of rhetorical analysis that our museum partners found useful more readily available to them, despite the fact that they had neither the theoretical nor the research training needed to do it routinely. To say nothing of the time.

In making these extensions, we have been very careful—perhaps overly so—not to extend too far. I've played this robot idea as tongue in cheek thus far, but I am quite serious about

not putting resources out into the world that let our disciplinary knowledge be easily co-opted, even weaponized, to do harm.

But for the moment I will stay away from apocalyptic imagery and pose a question: can we live with robots? Let me clarify: by "we" I mean the people in the room today, and others like us. And by "live" I mean something close to "continue to make our living by writing, and teaching others to write and speak well, ethically, with grace and creativity, with purpose and with keen attention to who we influence and how."

I think the answer is: maybe. It's not a no. But it's not a definite yes either. So much of the writing that folks do day today is routine that it will be quickly replaced by robots. Soon. No looking back. And companies such as Automated Insights and Narrative Science won't even have to use the word writing at all to sell their services. In fact, they don't now. They say things like: "you are awash in data, but what you really need is the stories the data tells. Let us help you find those stories."

Let me give you a prediction of my own. I don't think we are far away from a time when almost nobody composes a first draft of anything but texts meant to be taken as, for lack of a better word, art. We'll fire up our writing software and ask that it get us started. You might ask that it constrain itself to using only those words that it knows are already yours. Or, depending on the task and genre, you might ask that it incorporate texts written by others. You'll take over at the revision stage.

Think of your own writing process, and you may concede that this transition is already well under way. I wrote this talk by assembling texts I've been writing for the last year or so now. Words and images, yes, but also frameworks and structure. I didn't have them all in one place or in one framework as a "draft." It was messier than that. But it wouldn't be inaccurate to say I started by revising.

So while I think the robots are coming, I don't think this means humans are going to vanish from the scenes of writing any time soon. But I think this means that as writing teachers and researchers, and especially as rhetoric scholars, we have other, important roles to play.

Let me begin to sketch possibilities for living with robots with a heuretic device invented by Michael Wojcik in his 2012 M.A. thesis at Michigan State where he offered thoughts toward a definition of "computational rhetoric." Wojcik suggested that we might conceive of a computational approach to rhetoric by thinking about various kinds of scholarship and projects that exist along four axes. The first is perhaps the most intuitive. It describes a continuum of robots that make texts vs. those that interpret them. The second describes why the robots do what they do—to help someone engaged in a domain-specific task? Or, at the extreme other end, to test the very limits of what robots as writers and rhetors can do? The third axis contemplates the relationship between humans and robots. We might understand it as moving from a human-dominant assistive relationship on the left to a more fully autonomous agent on the right. The fourth axes defines how the robot's governing rules function, either as a set of fixed rules that process dynamic input or as an adaptive, evolving system that changes, or learns, over time.

If we are going to live with robots, we had better get busy exploring the problem space defined by these axes. And others, besides, most probably. But these are a good start. And let me tell you, we have some work to do.

In Figure 23.1 I've mapped four projects—three of which I've discussed above and a fourth, *Eli Review*—onto Wojcik's axes. *Use What You Choose* was the first time Ryan and I made a deliberate effort to go explore parts of the problem space where we had not yet visited. We felt that was in the spirit of the RSA Summer Institutes, and part of an explicit goal of ours to help more rhetoric and writing scholars prepare to do the work of shaping the development of

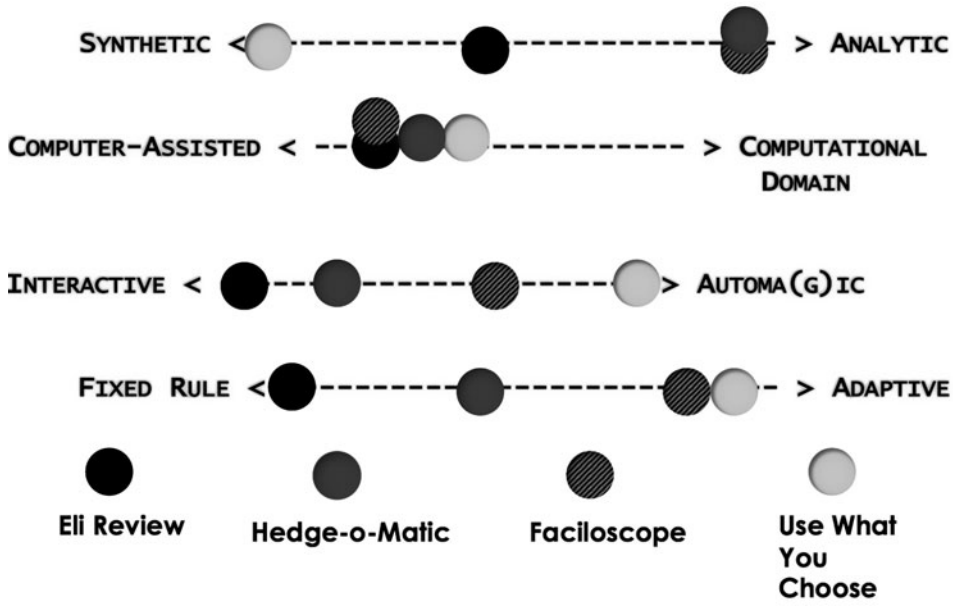


*Figure 23.1* Four Projects Mapped onto Wojcik's Axes

automated writing technology. Neither of the two automated writing companies I mentioned earlier were started by academics with rhetoric and writing backgrounds. This is important because it means that, lacking a disciplinary perspective on what produces a text and on the ethical implications of what it means to learn to use rhetorical strategies, these groups have nonetheless produced robots that produce texts and share them with the world. We might say they aren't really writing. Or that what they do isn't all of writing, at least. We might say that they are assembling texts that look like other texts that someone has shown them. But even this can be pretty powerful.

*Use What You Choose* does a little of that, but also does something different. It finds bits of embedded genres—deliberately, structures that are much like Bakhtin's speech genres—and offers them back to a reader as a gesture of assistance. Its role is not to mimic (and thereby displace) a human, but rather to sit in relation to humans on either side of a purchase transaction and offer help that represents a diverse set of use experiences. In this way, it is a robot that performs an ethical relationship with human readers and writers that we, it's creators, can live with.

Eli, a fixed rule, interactive, computer assisted service is designed to explicitly help teachers and students who are writing. It coordinates and assembles feedback for human learners. But it doesn't learn anything from the many sessions it helps to facilitate. At least not yet. And what about the others? Why did we make them? Why have sought to teach machines rhetoric?

Why teach machines rhetoric? I think there are at least four good reasons to do so:

- to extend rhetorical expertise to those who may benefit from it but who may lack explicit rhetorical training;
- to extend the capacity of humans to do certain kinds of rhetorical tasks due to challenges of scale, seeking the affordances of speed;

- to extend our knowledge of rhetoric using thought experiments, executed in computer code, to test conjectures, pursue answers to questions, or simply explore possibilities;
- to stay involved in the kind of work that mobilizes our disciplinary knowledge in ways that we may or may not approve of, preserving our right to intervene or lead when needed.

The robots are already here. And more are coming. And by and large, it will not be folks with training in writing and rhetoric studies who create or use them. But we can perhaps be among those who influence both how they work and how they are incorporated into the writing practices of people and institutions. I think we definitely should be. And in order to do that, we need to stay involved with theorizing, building, and researching writing by non-humans.

## Works Cited

Aristotle. *Rhetoric and Poetics*. Random House, 1984.

Condon, William. "Large-scale Assessment, Locally Developed Measures, and Automated Scoring of Essays: Fishing for Red Herrings?" *Assessing Writing*, vol. 18, no. 1, 2013, pp. 100–08.

Hunter, Lynette. "Rhetoric and Artificial Intelligence." *Rhetorica: A Journal of the History of Rhetoric*, vol. 9, no. 4,1991, pp. 317–40.

——. *Critiques of Knowing: Situated Textualities in Science, Computing and the Arts*. Routledge, 2002.

Jockers, Matthew L. *Macroanalysis: Digital Methods and Literary History*. University of Illinois Press, 2013.

Levy, Steven. "Can an Algorithm Write a Better News Story than a Human Reporter." *Wired 24*, 2012.

Kennedy, Krista A. *Textual Curators and Writing Machines: Authorial Agency in Encyclopedias, Print to Digital*. University of Minnesota, 2009.

Kennedy, Krista, and Seth Long. "The Trees within the Forest: Extracting, Coding, and Visualizing Subjective Data in Authorship Studies." *Rhetoric and the Digital Humanities*, edited by James Ridolfo, and William Hart-Davidson. U. of Chicago P, 2015, p. 140.

Larson, Brian, William Hart-Davidson, Kenneth C. Walker, Douglas M. Walls, and Ryan Omizoa. "Use What You Choose: Applying Computational Methods to Genre Studies in Technical Communication." *Proceedings of the 34th ACM International Conference on the Design of Communication*. ACM, 2016.

McLeod, Michael, William Hart-Davidson, and Jeffrey Grabill. "Theorizing and Building Online Writing Environments: User-Centered Design Beyond the Interface." *Designing Web-Based Applications for 21st Century Writing Classrooms*, edited by George Pullman, and Gu Baotong Gu. Amityville, NY: Baywood, 2013, pp. 7–18.

Miller, Carolyn R. "Opportunity, Opportunism, and Progress: Kairos in the Rhetoric of Technology." *Argumentation*, vol. 8, no.1, 1994, pp. 81–96.

——. "Technology as a Form of Consciousness: A Study of Contemporary Ethos." *Communication Studies*, vol. 29, no. 4, 1978, pp. 228–36.

——. "Writing in a Culture of Simulation." *Towards a Rhetoric of Everyday Life: New Directions in Research on Writing, Text, and Discourse*, edited by Martin Nystrand, and John Duffy. U. of Wisconsin P., 2003, pp. 53–83.

——. "What Can Automation Tell Us about Agency?" *Rhetoric Society Quarterly*, vol. 37, no. 2, 2007, pp. 137–57.

——. "Should We Name the Tools? Concealing and Revealing the Art of Rhetoric." *The Public Work of Rhetoric: Citizen-Scholars and Civic Engagement*, 2010, pp. 19–38.

Moretti, Franco. *Distant reading*. Verso Books, 2013.

Omizo, Ryan, and Hart-Davidson, William. "Hedge-O-Matic." *Enculturation* 7 (2016). http://enculturation.net/hedgeomatic.

Omizo, Ryan, Minh-Tam Nguyen, Ian Clark, and William Hart-Davidson. "You Can Read the Comments Section Again: The Faciloscope App and Automated Rhetorical Analysis." *DH Commons Journal* (October, 2016). https://dhcommons.org/journal/2016/you-can-read-comments-section-again-faciloscope-app-and-automated-rhetorical-analysis. Accessed 29 June 2017.

Perelman, Les. "Construct Validity, Length, Score, and Time in Holistically Graded Writing Assessments: The Case against Automated Essay Scoring (AES)." *International Advances in Writing Research: Cultures, Places, Measures*, 2012, pp. 121–31.