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Response to *ReRites* (October)

Harvesting *ReRites*

Digital poetics may be reaching a phase that is so labor-intensive that it can be best understood as a form of symbolic agriculture.

The human's place in today's economy increasingly can be defined in terms of two positions: one can be either "above the API" (an "Application Programming Interface") or "below the API."[1] To be "below the API" is to engage in work that is managed increasingly not by people but by algorithmic systems, especially artificially intelligent ones. Most prototypical of this position are the Uber drivers, TaskRabbits, and other "gig economy"

1 Kosner, Anthony Wing. "Google Cabs And Uber Bots Will Challenge Jobs 'Below The API'." *Forbes* 4 Feb., 2015, https://www.forbes.com/sites/anthonykosner/2015/02/04/google-cabs-and-uber-bots-will-challenge-jobs-below-the-api/#416d515e69cc. Reinhardt, Peter. "Replacing Middle Management with APIs" 3 Feb., 2015, https://rein.pk/replacing-middle-management-with-apis.

workers whose labor is solicited, choreographed, and evaluated via algorithmic systems. To be "above the API" is to be responsible for designing and managing the computational systems that in turn manage those below. Most prototypical of this position are the managers of tech companies and the software engineers and machine learning researchers at tech firms large and small. In McKenzie Wark's vocabulary, these are the "vectoralists" whose distal power lies in the computational aggregation and coordination of information, as well as the privileged "hackers" who actually design and operate their software.[2] Such jobs are rare, and a wide range of other professions are (if not disappearing entirely) gradually slipping below the API, including teaching and "content generation" (née "artists," "journalists," etc.).[3] Above, or below: "You either tell robots what to do, or are told by robots what to do."[4]

ReRites demonstrates that there is a path between these two options. Or not a path, exactly, but a vast field that must be patiently traversed—simultaneously dusty and outrageously verdant, monotonously sublime and speckled with beautiful and rare specimens. These are the fields of words to which Jhave awoke every morning during the composition of *ReRites* itself. As his website explains, he would begin each day by opening

2 Wark, McKenzie. "The Vectoralist Class." *e-flux journal* no. 65, 2015, http://supercommunity.e-flux.com/texts/the-vectoralist-class/.

3 When publications live and die according to the subtle fluctuations of Facebook's proprietary Newsfeed algorithm, writing can be seen as an attempt to please this meta-editor. See Oremus, Will. "The Great Facebook Crash." *Slate*. https://slate.com/technology/2018/06/facebooks-retreat-from-the-news-has-painful-for-publishers-including-slate.html.

4 Rao, Venkatesh. "The Premium Mediocre Life of Maya Millennial." *ribbonfarm*. 17 Aug., 2017, https://www.ribbonfarm.com/2017/08/17/the-premium-mediocre-life-of-maya-millennial/.

up his text editor, another silent crop of almost-poems having reached their maturity, waiting to be nurtured and trimmed and further transformed into the poems ready for human consumption. His website documents the quantity of this early-morning, agrarian toil: "60 hours every month. 2 hours a day, 6-7 days a week."

And yet these numbers do not give an adequate impression of the sheer quantity and variety of labor that went into the composition of *ReRites*. Just as contemporary agribusiness requires the farmer to acquire and successfully deploy complex and expensive machinery, Jhave had to do the unromantic drudgery of setting up a deep learning infrastructure—no small feat, as they are complicated and still at this point quite brittle, requiring many obscure and difficult-to-configure drivers. Most personal computing these days allows one to be blithely unaware of the inner workings of the actual machine. Not so with deep learning. To train large models in days rather than weeks or months, one must make sure that the deep learning system is running on at least one GPU (Graphics Processing Unit) rather than a comparatively lethargic CPU. (Does your computer even have a dedicated GPU? And, if so, what brand? Certain makes and models won't play nicely with PyTorch, the deep learning framework that Jhave uses. The road to deep learning is paved with incompatibilities.) One may rent time from a powerful cloud-computing service that offers access to state-of-the-art GPUs, perhaps the most convenient way of getting a deep learning project up and running. As his website also notes, however, Jhave obtained a GPU for himself through an academic grant program offered by chip-maker Nvidia. (At present, the GPU in question, Nvidia Titan X, sells for over 1300 USD on Amazon.com.) And so, prior to actually doing any serious deep learning to generate these poems, Jhave had to explain to a major corporation exactly why he should have its product

for free. Such a precious and occult machine requires special care. A README file on one of Jhave's GitHub pages carefully notes the several months between actually acquiring the GPU itself, pairing it with other necessary hardware, and setting up the proper "CUDA" drivers that allow the programmer to command the GPU. This is all to say nothing of the actual collection of "training data," the more than 1 million lines of poems and other linguistic mass that the statistical model learns to mimic. Deep learning is harnessed most naturally by the corporations that aggregate and own troves of Big Data and that command limitless computational resources. For the individual, the deep learning is a powerful burden.

I have described many of the labors of Jhave, but I have not mentioned the form of work that is perhaps most characteristic of deep learning: waiting. Even under the best circumstances, training all but the most simple statistical models with a deep learning system can take hours or days. The deep learning system makes glacial passes through the data—called, in the accurately metaphorical computational vernacular, "epochs." It occasionally spits out bits of evidence, hinting at whether or not it is improving bit by bit or has stalled prematurely. During this time, the human is rendered unproductively idle, unable to interfere or instruct, and any fit or flicker of poetic inspiration enjoys ample time to naturally resolve itself. All there is to do is stare at the progress bar. Will the crop be a success? Or will the harvest bring only bushels upon bushels of drivel? And this is only one cycle of training. The art of working with deep learning is in adjusting the "hyper-parameters" of the system and even more dramatic, making changes to system architecture. If the current crop is disappointing, perhaps a slightly different arrangement of these variables will yield better results—yet finding out comes at a penalty of still more days. *ReRites* chronicles these dilated cycles

of learning and re-learning, number crunching and troubleshooting, patiently waiting and carefully tending.

Jhave's practice combines elements of both of the key positions in the information economy, being above and below the API. Jhave copies (rather than seizes) the vectoralist's means of production, the infrastructure of haute machine learning. Yet, instead of using it to efficiently command other people to do various tasks (pick up groceries, ferry a stranger uptown) or to furnish increasingly accurate movie or sneaker recommendations, he has inefficiently turned his deep learning infrastructure back on himself. He is below his own API. And yet not quite so, because this deep learning system does not issue him commands. It simply creates for him more unbidden work, more terrain through which he must productively march, himself his own thresher. The result is a compromise between the scale of the neural network—which, once trained, generates a thousand poems as easily as it generates one—and the human, who strains to keep up with the network's overwhelming fecundity without assuming its shallowness. The "box set" of all twelve *ReRites*, a silo that is capacious but finite, is the unit of this struggle's measure.

What is gained by Jhave's refusal to be content with the easy pleasure of triggering the Generate_Poem() function, by his insistence on mixing his labor with the digital output? For one thing, the poems themselves. As in any well-appointed grocery co-op, one is struck not just by the dizzying variety of the produce on offer—the result of the deep learning model's inhumanly capacious language model—but also, on closer inspection, by these items' minimally-processed freshness—the result of Jhave's judicious insertions and deletions. For another, the structure of time—the patterning of it according to extended computational and literary cycles. These are

ReRites, after all—rituals or customs that give rhythm to the flow of being. Below the API, where most of us live or will live, time is neither linear nor ritualistically circular but fragmented according to the density of need and activity, as during Uber's hours of "surge pricing." So often, slowness is imagined as an effect that can only be achieved through retreat from highly technologized systems of labor and productivity (e.g. "slow food"). And, likewise, it is the slow, deeply-attentive modalities of reading that digital media are supposed to have all but annihilated. Jhave's project shows us that—with some work—deep attention, deep time, and deep learning can be epiphenomena of each other.

ReRites
Human + A.I. Poetry

+

RAW OUTPUT
A.I. trained on custom poetry corpus

+

RESPONSES
8 essays about poetry and A.I.
Introduced & edited by Stephanie Strickland with essays by Allison Parrish, Johanna Drucker, Kyle Booten, John Cayley, Lai-Tze Fan, Nick Montfort, Mairéad Byrne, Chris Funkhouser, and an author-note from **David (Jhave) Johnston**

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