

Stuck: The Deep Inertias of Large Language Models and How to Digress

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This text is dedicated to Amanda, who reminded me every day that,
sometimes, more can be said with a head bump or by throwing something
from a high place

Abstract

Large Language Models (LLM) have exploded into public attention after the release of ChatGPT. Astronomical amounts of resources are now being plunged into researching and developing these technologies that are touted to bring a revolution, causing a pandemic of fear and hype. Despite this sense of standing on rapidly shifting ground, however, LLMs suffer from deep inertias. They operate within sticky historical obduracies caused by systemic, commercial, and ideological entanglements with extractive propensities. Moreover, their outputs are increasingly used as data for training, lodging them into a closed loop. LLMs are particularly ill-suited to tackle such challenges because in reproducing generalized patterns interpolated from the data, they muddle the situational and historical specificities, acting as engines of ahistoricity. This study thus invites digression, to veer away from the appointed course, relying on philosopher Masaya Chiba's interpretation of Deleuze that emphasizes disconnection as an antidote to delusions of connecting everything as data, which immobilize the technologies and those who use it, preventing them from taking shape otherwise.

Acknowledgments

I talk a lot about my work when thoughts are brewing. This text and the coupled artwork have been directly shaped by the conversations I had with many people.

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And finally, this project would have been literally impossible without Claudia, my life partner and master of digression, our child, Tōri, who never ceases to make me want to experience more of the world together, and our cat, Amanda, who left us too soon while I was writing this thesis.

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Prologue, or On Being Stuck

Two things happened after I began this research: the topic of Large Language Models (LLM) blew up into public consciousness through the release of ChatGPT and I became a parent. Suddenly, everyone was talking about LLMs. So many new models, functions, and services were being released, and so much was being published, talked about, celebrated, and criticized. I felt I could not keep up. I felt I had nothing to contribute. This feeling was coupled with a general disorientation. Our child, Tōri 十織, was born on August 15, 2021. Since then, all semblance of control over my time disappeared, especially in terms of sleep. Time was chopped up and unavailable to the way I used to use it. I became distant from many things, people, and, of course, from this research too. I had vague thoughts about writing this thesis during my parental leave, but even reading was difficult. On top of it, I was beginning to lose interest in my research object. The outputs of LLMs that I was fascinated by quickly began to feel not only boring but somehow bad for my soul. I felt stuck.

This was a problem, not the least because all of my professional work is directly engaged with language—from editing, to translating,

and writing. All these jobs are severely affected by the new language technologies, and not being able to deepen my understanding through the research felt like a dent on my professional identity too.

The aspirations I had of being a smiling engaging parent who was, at the same time, working tirelessly and producing inspiring things through research and art was untenable. These images I had of an ideal self had been fragmented and needed to be recomposed. But how?

The answer was right in front of my eyes, every day. With me was an entity that was constantly rearranging itself, achieving new ways of being with and in the world, building new ones. It was doing that despite the difficulties that from the outside seem unsurmountable. In a short period of time, human babies learn to distinguish and attune their senses that are at first all enmeshed together, coordinate their every growing muscles and bones to move, construct the notion that they are separate from the world, hear and see a cacophony of sounds and gestures produced by larger humans and understand and begin to use them to communicate. They take one word and play with its sounds endlessly, applying it to different situations and things to see what reactions it provoked. Mé 目, the Japanese word for “eye”, could be assigned to a human eye, to an eye in an illustration, to a hole in a wall, to a logo on a shoe. It was *me* everywhere for a while. Every word, every action, would lead to more action, seemingly without an objective. It was astonishing.

Through learning to be with Tōri, things began to move. I began to move.

I'm starting this text with this personal note because these personal experiences came to color my findings. I began to see that the technologies I was looking at were also suffering from a kind of immobility, an obduracy deriving from its scale, environment, and history. LLMs also need to be set into motion, in a different way.

Let's begin.

Introduction

In Sakyo Komatsu's "Long Road to the Gods" (2012 [1967], in Japanese), fifty-sixth century humans communicate with one another in a way that makes it impossible for the protagonist, who has reached this future age through cryogenic sleep, to talk with them. The future humans speak mostly in brief and quiet sounds that seem to retain traces of ancient (our current) languages, and which are enough to convey most daily necessities. When engaging in longer discussions, however, two or more of the future humans produce a long string of sounds akin to birdsongs to state their thoughts at incredible speed *at the same time*, without attentively listening to one another. When particular words or phrases produced by others resonate with what one is saying, these would be *probabilistically* sorted out in a way that allows each to develop their thoughts in new directions. Language has become a means to output information while receiving just the necessary inputs that are deemed useful through mathematical operations.

Although the future humans are able to do this because of the biological mutations that they underwent over millennia, it is not difficult to see a direct parallel with the linguistic landscape that has

been established technologically in current times. The stream of text on social media, one that is often probabilistically curated using algorithms, flow in front of our eyes as we scroll and tap on an emoji reaction. We post our own texts with no clear idea of the addressee or expectations of dedicated attention. This surge of text is being amped up by the introduction of Large Language Models (LLMs), a technology most widely known through ChatGPT that was released in 2022 by OpenAI. LLMs allow for the production of texts that are often indistinguishable from human-written texts at the click of a button. Unsurprisingly, they are already beginning to permeate text production, from online articles to school essays.

Because of their remarkable abilities, LLMs are inspiring ideas of radical change that are likened to the next industrial revolution. It is seen as a key Artificial Intelligence technology that can bring either never before experienced abundance or human extinction. Concrete changes are already happening in the present. While some celebrate the boost in productivity, reports of critical misinformation, of workers being automated away, of services such as counseling being replaced by LLMs also abound. All of this is contributing to a sensation that we are on the cusp of irremediable change.

This pandemic of hype and fear, however, tends to mask the fact LLMs are bound by sticky pasts and problems that should be addressed in the present. They suffer from what I characterized as *deep inertias*, those historical obdurances that are not only reflected, but also eperfordm and exacerbated, by LLMs. Bias, for example, is something that is often pointed out in regards to the output of the

models. I discuss how the term is problematic in itself, but it is undeniable that encoded into the technology are existing inequities that are present in the digitized data on which the technologies are based. Such biases marry logics of extraction—of resources, labor, and ever more data—and ideologies that can be traced back to early-twentieth-century eugenics. They become infrastructural to our experience as they are integrated into services that we already use, and as they forge interdependencies with other digital infrastructure—like that which supports the "cloud"—they become even more adverse to change while concentrating power on a handful of corporate entities. These companies operate within a competitive market environment that shapes how the technologies are developed, deployed, and legitimated.

LLMs are thus lodged in a grid that situates them firmly within problematic histories. To make matters worse, they are exceptionally ill-equipped to critically engage with such histories. This is because their output is in principle ahistorical. Not only do they break the web of references by paraphrasing their sources instead quoting, but they are designed in a way that seek out generalized patterns found in disparate linguistic sources, flattening and removing any of the idiosyncratic situations in which the texts were produced and disseminated. LLMs are thus *engines of ahistoricity*. Moreover, the models are increasingly trained on their own output, sometimes by design but also simply because the massive amount of text generated by them is beginning to inundate the internet in different ways. They are entering a closed loop that keeps expanding, making it difficult to imagine an outside. They are

stuck in a “Bad Place”, to use art critic Noi Sawaragi’s characterization of the conditions of postwar Japanese art, which he also saw as being stranded in an ahistorical circle.

It is difficult to find lines of flight away from this complex situation. To find clues for ways out, for creating openings in the circle, I have turned to philosopher Masaya Chiba. Chiba, drawing on his unique interpretation of Gilles Deleuze, suggests that excessive connections restrain possibilities for new configurations to occur, for *becoming*. LLMs suffer from excessive connection, from near-totalitarian delusions of bringing everything into their vector space so that they can be mapped in terms of relations between data points. Chiba’s antidote is to emphasize *asignifying ruptures*, disconnections that are not too meaningful, which arise due to the contingencies that are ingrained in the finitude of entities. It is these cuts that may allow us to *digress*, to veer away from the appointed course. In the examples I explore—from digital poetry, to instruction-based art, and tabletop games—I try to seek out clues on how this digression may be achieved.

Following this introduction, Chapter 1 presents a historical exercise of following a mathematical model that was highly influential in the twentieth century, the Markov Chain, to illustrate how no technology arises and operates in a vacuum, a viewpoint that is crucial for this text. Chapter 2 describes the mechanisms of contemporary LLMs developed using deep learning techniques. Chapter 3 elaborates on the historical obdurances suggested above, while Chapter 4 describes how LLMs are stuck in a loop. In Chapter 5, I begin to look for ways out, drawing on the philosophy of

Deleuze, of which applications I try to discern in digital poetry (Chapter 6), instruction-based art (Chapter 7), and games (Chapter 8). Chapter 9 describes my own artistic experiment.

Despite their communicative prowess, Komatsu's future humans with whom we began this introduction have reached a spiritual impasse and are on the way to semi-voluntary extinction. This may be rather too apocalyptic of an imagination. LLMs do present, however, challenges in the present that are already affecting our relationship to language and to each other. This study is an attempt to see how this is happening and to seek out ways of putting things in motion in a different way.

1. Links in the Markov Chain

To begin, a historical exercise to establish some ground rules. Although the exercise will present some of the historical trajectories in natural language processing (NLP), a field that combines computer science and linguistics to research ways to computationally handle human language, it is by no means a detailed survey or even an overview. Its aim, apart from eliciting some of the themes that will run through this text, is rather to show that no technology, not even a mathematical model, can be seen as independent from the historical conditions from which it emerges. Technology and society always develop together, mutually influencing and shaping one another. To show this, this opening chapter focuses on a particular mathematical model that had an intricate relationship with language technologies throughout the twentieth century, one that became a different thing at different times: the Markov Chain.

The Markov Chain is a mathematical model that describes the probabilities of a sequence of events, where the likelihood of something happening is solely dependent upon the state of the current event. A classic example is that of weather states: it is less

likely for a rainy day to follow a sunny day than a cloudy one, and the probability of each of these transitions can be described with a number thus allowing for calculations.

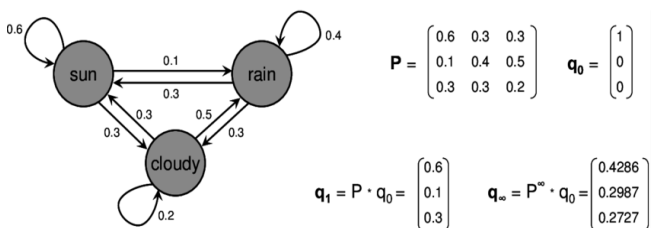


Fig. 1: Markov chain for a simple weather model showing the probabilities of one weather state following another. Image from Arnold (2007).

The model's name comes from Russian mathematician Andrey Markov, who studied such processes in early twentieth century, marking a shift from earlier probability theory that focused on the probability of occurrence of *independent* events. The reason he ventured to work on this is worth a chapter in itself, as it involves a raucous conflict with a deeply religious and monarchist mathematician who sought to use probability theory to prove free will, which did not sit well with Markov, a staunch atheist and anti-tsarist who saw the former's work as an abuse of mathematics (Basharin, Langville, and Naumov 2004). But we need to move swiftly. The Markov Chain has since gone on to find widespread application in diverse fields, from climate modeling to queuing theory, and continues to be relevant today as seen in Google's PageRank algorithm that evaluates the importance of a website

according to the number and quality of links it receives, based on what is essentially a Markov Chain, where webpages are states and the links are the transitions from one state to another.

Despite this wide adoption, Markov himself did not step beyond theoretical discussions for years, until, in 1913, he published a study of an application of his model: an analysis of language in Alexander Pushkin's most well-known work, the novel in verse *Eugene Onegin*. This marriage of probability theory and language is relevant for this study in many ways, but two points are particularly of note. First, we need to consider why Markov turned to language as an example to work on his theory. It is by no means an intuitive idea to see language as a series of stochastic events—meaning having a random probability distribution. David Link (2006b) proposes a few suggestions as to how Markov may have arrived at this idea, from teacher's influence to the work of contemporary linguists. Most compelling to this study, however, is the likelihood that he was inspired by cryptography. Cryptography came to play an important role in early twentieth century due to the successful marketization of radiotelegraphy, a technology that relied on the public transmission of waves to transmit private messages, which gave rise to the need to encrypt messages. In other words, Markov's peculiar conception of language was strongly informed by a technological development, a point that is crucial to remember as we survey current forms of linguistic technologies. Secondly, Markov prepared the grounds for divorcing language from semantics. The way he studied *Onegin* was to take the first 20,000 characters and organize them, by hand, into grids of ten-by-ten characters (without spaces),

to analyze solely the frequency of vowels and consonants and the relationships between them (Link 2006a). That is to say, he was entirely uninterested in the meaning that these letters sought to convey.

This attitude found a clear formulation of intent some decades later, in the oft-quoted statement by mathematician and engineer Claude Shannon: "Frequently the messages have *meaning*; that is they refer to or are correlated according to some system with certain physical or conceptual entities. These semantic aspects of communication are irrelevant to the engineering problem" (emphasis in the original). This quote comes from the first paragraphs of "A Mathematical Theory of Communication" (Shannon 1963 [1948]), a text that is often described as foundational to information theory and to the information age in general. In it, Shannon puts forward the understanding of communication as the process in which information is encoded to travel through a noisy channel and decoded at the destination. What is noteworthy is his definition of information as a message selected out of possible messages. In other words, the information source, as well as the entire process of communication, is construed as probabilistic. It is therefore not surprising that he adopts the Markov Model in his work, as his conception of a message is that of a stochastic series of characters. In the paper, he uses the model not only to analyze the sequencing of letters in the English language, but also makes the crucial step to produce text:

THE HEAD AND IN FRONTAL ATTACK ON AN ENGLISH WRITER THAT THE CHARACTER OF THIS POINT IS

THEREFORE ANOTHER METHOD FOR THE LETTERS
THAT THE TIME OF WHO EVER TOLD THE PROBLEM
FOR AN UNEXPECTED. (44)

Although his interest in the English language (with the crucial addition of the space as a letter of the alphabet, which Markov had omitted, to facilitate automatic segmentation) continued with another seminal text published two years later entitled "Prediction and Entropy of Printed English" (1951), it is crucial to note that Shannon's ambitions were universal, achieved by abstracting and flattening differences with the aid of mathematics. This aspiration was reflected in the subtle change to the title of the text when it was later published as a book: "a" mathematical theory became "the" mathematical theory. We should also not lose sight of the fact that many of the ideas presented in these later texts were developed during WWII, when Shannon worked on cryptography and fire control at Bell Labs through projects funded by the U.S. military. These texts borrow much from the then confidential report "A Mathematical Theory of Cryptography" (1945). This report is further predated by a report he co-wrote at Bell Labs entitled "Data Smoothing and Prediction in Fire-Control Systems", where the problem of targeting, tracking, and hitting a target with a ranged weapon is treated as a "a special case of the transmission, manipulation, and utilization of intelligence", that is to say as a data processing problem (Mindell 1995). Language and firing a weapon were thus brought to the same space.

This last text was significantly influenced by the work of Norbert Wiener, considered to be as one of the core originators of cybernetics, who further reinforced the universalizing tendency by collapsing the differences between human, machine, and animal communication. He sought to construct a model that is applicable to all types of communication, that is to say, not just human, but also animal and machine. Cybernetics became immensely influential in diverse fields, and with its spread, the notion that "information is information, not matter or energy" (Wiener 1961) also travelled, meaning that the imagination that information can be dissociated from its material supports, that it can be *disembodied* as Katherine Hayles (2001) analyzes, became increasingly prevalent.

These postwar developments spurred research on the computational processing of language. From its early days in the 1950s, where the major focus was automatic translation instigated by the need to understand foreign language documents in an environment permeated by the Cold War, most methods relied on trying to identify and algorithmically formulate the fundamental rules of language that the computer would apply to data. This approach is generally known as Symbolic NLP, which involved feeding handcrafted rules to computers. The approach would only grow in stature with the influential work of linguist Noam Chomsky, who, in a series of texts in the 1960s, argued for the existence of a biologically innate structure in the human mind to acquire and generate any language. Due to this predominance of the Symbolic NLP approach, it was with much derision that the work of some

IBM researchers was welcomed when they presented their approach to process language statistically.

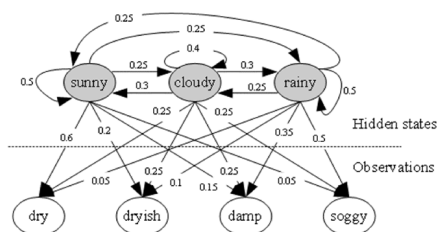


Fig. 2: A simple Hidden Markov Model for weather forecasting. The states in gray are “hidden”, that is to say they cannot be directly observed. Image from Nguyen (2016).

The Continuous Speech Recognition (CSR) group was formed in 1972 in IBM as a separate entity from existing speech research at the company. The group extended the work done by Shannon and others by adopting the Markov model, but crucially introduced the Hidden Markov model to statistically achieve results that were far better than rule-based methods. In the Hidden Markov model, observed events are produced from an underlying series of stochastic events. An example, sticking to the weather topic as before, would be observing that someone is carrying an umbrella inside a room with no windows and probabilistically surmising that this means that it is raining outside. I will not go into detail of how exactly this model was used, but the adoption of this method

entailed a number of things, which I will go over below in the light of Xiaochang Li's (2017) insightful study on the topic.

First, the adoption of the Hidden Markov model exemplifies how the group, composed solely of engineers and mathematicians without any linguists whose expertise was initially shunned, had no interest in understanding linguistic principles. The goal was *better performance*. Thus, not only was ignorance (about how language operates) inscribed in the machinic arrangements, but heuristically achieving what was deemed useful came to have paradigmatic importance, unsurprisingly for a private enterprise. (In fact, IBM's efforts were spurred by its fear that the growth of processing power would outgrow the needs of computing tasks, thus deadening the need for new products. The company needed to come up with a way for computers to require more horse power.) Second, producing the models required a significant amount of data, marking a crucial shift towards data-driven approaches. IBM put large efforts into producing this data, by employing an enormous workforce (composed mostly of women) to convert legal documents, which IBM had in abundance due to the antitrust lawsuit laid against it, into punchcards, the method of data delivery used by computers at the time. Thus, third, speech came to be treated as a problem of data processing, and as such it was further detached from the body and senses which added noise. It is also worth noting here that conversion of speech to text entailed turning sound waves into a meaningful string of letters. It was conceptualized as a way to *produce* information and knowledge.

This brief historical exercise has shown how the same model became different things at different times, molded by the militaristic or commercial needs of the time, and in turn changed the conception and approaches to understand human language. It suggested how the epistemic frameworks—the grounds over which things are known and knowledge produced—in which humans and machines worked together has continued to shift, recruiting different allies and reconfiguring arrangements and alignments. This is the zoomed-out view we need to keep in sight as we now zoom in to the mechanisms of contemporary technologies based on machine learning.

2. The Inner Workings

Language processing technologies rely on mathematics, or more precisely, mathematical functions. What happens when we make a query to ChatGPT, for example, is that our input goes through a massive mathematical function that predicts and generates the most appropriate string of words according to the probabilities of their occurrence, adding one word at a time that is calculated by the function.

But how is this possible? The way computing handles language is to assign numbers to letters to make them amenable to mathematical processing, meaning taking an input of (a series of) numbers and to output some (series of) numbers. The numbers can be assigned not just to letters but also to words or segments of words (tokens), and this makes it possible to calculate the probabilities of one occurring after another, or a pair, or even longer sequences following or surrounding one another. This pattern of probabilities can be expressed as a function, and that is essentially what a model is. A model, in simple terms, is a mathematical function (or a combination of them) that classifies and predicts new information based on certain patterns that are derived from data. In

the case of contemporary technologies, these are referred to as Large Language Models (LLM), and are produced by a process of "automatically" calculating the optimal function based on the massive amounts of data. This process is what is known as deep learning, a particular form of machine learning.

The notion of deep learning itself is not new. An article by Walter McCulloch and Walter Pitts published in 1943 entitled "A Logical Calculus of the Ideas Immanent in Nervous Activity" is often referred to as the point of origin for this approach. It involves computationally modeling the human brain by simplifying and mimicking the network of biological neurons with artificial ones to produce an artificial neural network (Kelleher 2019). Neural networks consist of nodes—the "neurons", or the input expressed as numerical data—that are connected to allow data to pass through "weighted" pathways, which carry the "input x weight" value to the next node. These weighted connections are called parameters, which is what we often read in relation to LLMs these days, when reports about new models mention the billions or even trillions of parameters involved. These networks are typically organized in layers, with each layer transforming an input to an output and feeding the output to the next layer until the final output is achieved. The "deep" in deep learning refers to the existence of two or more "hidden" intermediate layers between the initial and last layers. The layers can indeed go very deep: GPT-3 by OpenAI is reported to have 96 layers (Li 2020).

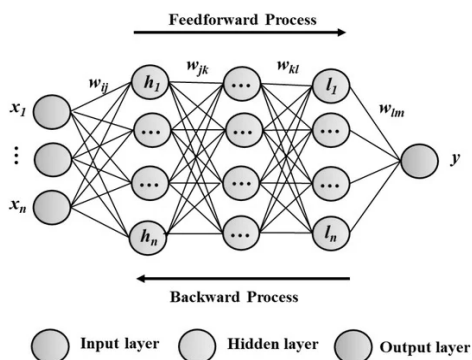


Fig. 3: An illustration of the layers involved in deep learning, and how numerical inputs are processed to produce a numerical output. The backward process known as “back propagation” adjusts the parameters to bring the output closer to the expected outcome. Image from Phyo and Byun 2021.

The neural network of a LLM is “trained” on a large corpus of text by starting with random parameters, which are gradually adjusted to match the predicted output of the model with the expected output through a process called “back propagation”. The adjustment relies on calculating how far the two outputs are using what is called a “loss function”. In other words, the training process incrementally tweaks the parameters so that the calculated “error” between what the model produces and the example data is minimized to the point that the model can “interpolate” (generalize) between the examples. It is this generalization that allows the model to then generate new sentences that are not found in the training data in response to unseen inputs (prompts submitted by users, for example). What is crucial to understand here is that, again, what is

being produced is a gigantic mathematical function (one with billions of elements), and that all these processes are calculated in terms of statistics and probability.

Because this method requires large amounts of data and processing power, something that was not until recently available, it went through a long period of relative obscurity. It was only in 2012 that it came into prominence, prompting a veritable explosion of research and development. This was the year in which a deep neural network called AlexNet far outperformed other methods in a visual recognition competition. The enormity of the influence it had is exemplified by the number of times the paper that describes the method (Krizhevsky, Sutskever, and Hinton 2012) has been cited: more than 140,000 as of September 2023. 2012 was also the year in which a research group composed of Microsoft, Google, IBM, and the University of Toronto published another seminal text that showed how deep neural networks outperformed previous models such as hidden Markov models in speech recognition (Hinton et al. 2012). In the same year, Google also announced that a neural network it built using 16,000 computer processors trained on unlabelled YouTube videos learned to recognize cat videos (Le 2013). More specifically to language processing, the following year Google released word2vec, a model that introduced vectorization of words to map the distributed relationship of words, producing remarkable results until it became out of fashion when the now prevalent transformer model was proposed in the influential paper "Attention Is All You Need" (Vaswani et al. 2017) (the "T" in GPT

indeed stands for "transformer", as in "Generative Pre-trained Transformer").

The move to deep learning methods marked important quantitative and qualitative shifts. First, the scale of the required data, of computing power and costs, and the models themselves became exponentially larger. This was enabled by the availability of data following the advent of the internet and widespread efforts at digitizing information, and of processing power with more powerful and cheaper processing units. It paved the path towards using more and more of the data and processing power in the competitive commercial environment geared towards capitalizing on such technologies. All of this also entailed a shift in the goals of research. Although deep learning for language processing also employs statistical methods to map the probabilities, there is a significant difference between what could be called classic statistical methods and the now fashionable statistical learning methods (Bzdok 2017). While model-driven classical methods use statistics to test a hypothesis by analyzing results using methods such as linear regression to infer a conclusion, data-driven learning algorithms interpolate patterns from the data to produce output. The sheer scale of the models resulting from deep learning, as well as the the automatic adjustment of parameters in hidden layers, makes it in principle impossible for humans to interpret and provide a narrative explanation of what the models are doing. Thus, the deep learning method focuses on heuristics, on trial and error to add ideas and tricks to achieve better performance. It is "basically an art" as prominent AI researcher and developer Stephen Wolfram (2023)

has put it. There is not much "theory" as such behind these techniques. They just seem to work remarkably well in handling and generating human-like strings of words.

One key concept that helps to understand the kinds of operations involved in the method is "word embedding". Embedding is the process in which, through the training process described above, words (more precisely "tokens", or segments of words) are converted into multi-dimensional vectors, expressed as an array of numbers. These vectors are "embedded" into the same continuous vector space so that the relationships between them can be mapped. Although the term "vector" may evoke images of an arrow in a two-dimensional space with x and y axes, vectors of word embeddings have far more dimensions. OpenAI, for example, announced that it succeeded in reducing the dimensions to 1,536, from more than 8 times that in the previous model. These multi-dimensional vectors position the word in relation to others according to the similarity of their usage in the training data.

What a vector shows is its relative position in relation to other word vectors: "boat" would be positioned near "ship" or "yacht". Word embeddings are therefore a distributional representation of the relationship of words. It is already remarkable that deep learning methods could achieve such a feat with higher levels of accuracy than traditional models that rely on hand written rules which were improved over decades of research, but there is more. Embeddings proved to be not only apt at representing similarities between words, but could also carry out some analogy tasks. Because vectors allow for arithmetic operations, researchers found that, for

example, subtracting the word vector for "man" from "king", then adding "woman", would result in a vector close to "queen" (Mikolov, Yih, and Zweig 2013). Although it is crucial to note that such tasks are not universally successful and fail in many ways, it is still astonishing that this works at all given that it is unclear why language should agree to such operations at all. It is striking enough, in fact, to alter our "image" of language, the commonly held notion of what language is and how it works (Gastaldi 2021). Language comes to be seen as something calculable, something that obediently follows mathematical logic and procedures.

3. Deep Inertias

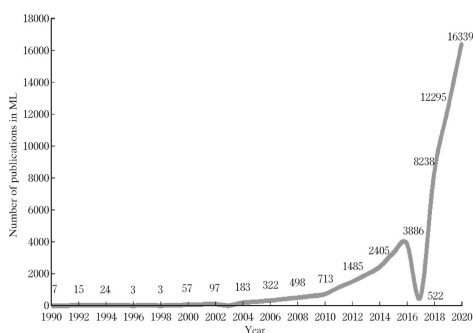


Fig. 4: Graph showing the exponential growth of papers published about machine learning (Image from Pugliese, Regondi, and Marini 2021). The growth trend is becoming even more pronounced in the past few years.

The description in the previous chapter pertained to the most elementary form of deep learning related to language. Many different kinds of neural network architectures have come and gone, and the speed and amount of development is exponentially increasing. Look, for example, at the graph below showing the explosion of papers published in the domain of machine learning ballooning year by year in this decade-long boom.

The trend is only increasing with the introduction of ChatGPT, which success has attracted interest from far and wide, prompting a deluge of research that is difficult to keep up with. The attention does not only go in the direction of more and faster technological development, however. There has been increasing alarm about the dangers and risks of these technologies too. The issues discussed range from inaccurate and fake information or misinformation (Bian et al. 2023; Pan et al. 2023), to environmental impact (Ligozat et al. 2022; Patterson et al. 2023), eenergy and financial costs (Strubell, Ganesh, and McCallum 2019), bias (Sheng et al. 2019; Hutchinson et al. 2020), data privacy and security (Plant, Giuffrida, and Gkatzia 2022; Derner and Batistič 2023), lack of transparency and explainability (Liao and Vaughan 2023), impact on labor (Eloundou et al. 2023), fairness and inclusivity (Piqueras and Søgaard 2022), english dominance (Joshi et al. 2020; Nicholas and Bhatia 2023), intellectual property (Kelli et al. 2020), etc. The list could go on. I do not wish to use this chapter to provide an overview of the problems, however. This is something that has already been done by others, not the least in one of the most influential papers on the topic that sparked much debate and coined an expression that is often heard today: "stochastic parrots" (Bender et al. 2021).

In the paper, the authors argue that LLMs require significant energy and financial resources, and that they have the tendency to "encode" hegemonic (racist, sexist, ableist, extremist) worldviews absorbed from the inscrutably large amount of data, which are then amplified when the generated texts circulate in the world. This results in already marginalized communities being dis-

proportionately affected by their deployment. Moreover, characterizing LLMs as "a system for haphazardly stitching together sequences of linguistic forms it has observed in its vast training data, according to probabilistic information about how they combine, but without any reference to meaning" (617), the authors liken them to a "stochastic parrot" that spews out seemingly reasonable sentences based on probabilities that were calculated. The "reasonableness" or the coherence of the generated text is, according to the authors, less the ability of the technology and more an inherent bias of humans to ascribe an interiority—beliefs and intentions—to interlocutors and impute meaning based on that.

The paper drew attention not only for its contents but also for some incidents surrounding it. Two of the authors of this paper, Timnit Gebru and Margaret Mitchell, were fired by their employer, Google. This was presumably due to the frictions the paper could cause with the large investment the company was making in the field. In fact, a few months after their firing, Google presented its new LLM called LaMDA in a keynote speech by CEO Sundar Pichai at the company's annual developer's conference in May 2021.

Building on the views presented in this study, and keeping firmly in sight the messiness that accompanied its publishing, I would like to focus on a particular angle to look at LLMs: inertia. Despite the feeling of being on shifting ground, where a major breakthrough that some liken to the next Gutenberg revolution or the industrial revolution is bringing radical change in our lives, despite the breakneck speed of development with new features and new abilities and new services—none of which should at all be

underestimated as the technologies are already bringing concrete challenges to people's lives—LLMs, at the same time, suffer from a fundamental resistance to change at its depths due to a gridlock of ideological, commercial, infrastructural, and relational obduracies shaped by historical dynamics. They are plagued with deep inertias.

Extraction

Let us first consider the life of LLMs. LLMs cannot exist on their own. The models run on computers, many of them. These many computers employ data on the internet that is spread over the "cloud", which in physical terms consists of massive data centers and cables spread around the world. Hardware requires minerals and other materials to be constructed, which are most often mined in the Global South. Mining, needless to say, is an activity that directly connects us with a history exploitation, of people and of the Earth. As Kate Crawford (2021) puts it, "from the perspective of deep time, we are extracting Earth's geological history to serve a split second of contemporary technological time" (31). As the demand for processing units increases, so does the demand for energy used to run them and, crucially, cool them. It is estimated that by 2025, the share of the ICT industry in global energy use, which continues to trend upward, could surpass 20 percent (Andrae 2017). Needless to say, this makes computing one of the major contributors to climate change, effects of which are known to disproportionately affect already marginalized communities (Levy and Patz 2015). Any

claims about using AI to combat it should thus be treated with caution if not suspicion. As Sasha Luccioni, a researcher in ethical and sustainable AI, puts it, "it doesn't make sense to burn a forest and then use AI to track deforestation" (Stokel-Walker 2023).

LLMs also require humans in their development and running. The development not only involves research into constructing the systems, but also processes of data labelling and moderation to prevent them from spewing out "harmful" content. What we should note is the distribution of those operations. The development is carried out by companies and universities mostly situated in the Global North with the necessary resources. The deployment of the technology is monopolized by a handful of mammoth corporations such as Google and Microsoft, which are concentrated in few cities particularly in the U.S. The content moderation part, however, tends to be outsourced to the Global South. It was revealed, for example, that OpenAI employed Kenyan laborers for 2 U.S. dollars per hour or less to label violent, sexist, and racist language to build a model that would be able to detect it in the output (Perrigo 2023). The laborers, of course, have little agency in deciding what constitutes harmful language. In 2017, for example, Guardian leaked PowerPoint slides in which Facebook outlined general rules for content moderation, bringing to surface the tacit lines tech giants draw in terms of what is allowed and what is not allowed to emerge into public discourse (Waller 2018).

Thus, LLMs are entangled in deep histories of exploitative extraction, whether it be material resources or labor. Looking at the history of computing, this should come as no surprise. Charles

Babbage, for example, is often credited with inventing the first mechanical computer, the Difference Engine, but what is less discussed is the fact that he espoused proto-Taylorist ideas about how to discipline labor and maximize profit in the context of industrialization and the abolishment of slavery (Whittaker 2023). The two are inextricably connected. Babbage took inspiration from theories of labor division to design his machine. Such notions of labor control directly drew from the knowledge and praxis accrued in the running of plantations, thus putting histories of enslavement into the computer. This continues to be apparent today. In a Super Bowl commercial, one of the most high profile TV commercials due to the exceptionally high viewership of the game, Amazon employed comedian and television host Ellen DeGeneres and her partner Portia de Rossi to advertise its voice-activated virtual assistant product Alexa (TheEllenShow 2020). In it, the two wonder "What do you think people did before Alexa?", prompting images of an aristocrat with a maid, a queen with a jester, or a politician with a black woman secretary, with the former issuing a command toward the latter in all cases. In other words, the ad forged a direct connection between Alexa's functioning and historical imaginaries of servitude, celebrating them as something to be retained in man-machine relationships. The arrangement of machines continues to be dependent on the same kind of exploitation.

Data

Such hegemonic relationships are reflected in the data that LLMs use to shape information in a regime of "knowledge extractivism" (Pasquinelli and Joler 2020). Due to the secrecy of companies and the sheer scale of the corpora of text used, it is difficult to identify all sources of data. There are some oft cited sources, however, such as Wikipedia. Wikipedia, which the "stochastic parrots" paper also mentions, is an apt example for the issues at hand. The website, which aims to provide "every single person on the planet" with "free access to the sum of all human knowledge" according to its founder's words, presents problematic skews: strength in certain topics, better coverage of the Global North, and gender bias both in terms of content and contributors (Barera 2020). Any website, from Reddit to Facebook, from which data is taken presents different kinds of such skews, which LLMs encode into its model as firm relationships between words.

It is therefore unsurprising that "bias" has become a central topic of discussion. However, the term bias is itself problematic. In a study of the usage of the term in nearly 150 papers in the field of natural language processing, Blodgett et al. (2020) show that it is often unclear what kinds of system behaviors are seen as harmful, in what ways, to whom, and why. Nor is the normative reasoning behind denoting something as "bias" explicitly conveyed, remaining as tacit assumptions of what seemingly self-evidently constitutes bias. Bias, moreover, is often coupled with the idea that "debiasing" is possible within the system, that is to say that it is an engineering

problem for which a technological solution can be found. Such views are "entirely insufficient to address the full spectrum of sociotechnical problems" generated by those system (Greene, Hoffmann, and Stark 2019). "Solving" bias thus often becomes a "seductive diversion" (Powles 2018) that diverts attention away from the kinds of problems discussed here.

What this points to is the fact that data does not live up to its widespread image of objectivity and neutrality; it is never "raw" and always "cooked" (Geoffrey Bowker's observation expanded in Gitelman 2013). A case in point is the Colossal Clean Crawled Corpus, also known as C4, a dataset created by Google to train its own language models. Investigating how Google filtered out some data from the Common Crawl dataset on which it was based in order to produce a "clean" dataset, researchers identified that the mere mention of sexual orientation, or the use of certain dialects of English such as African American English and Hispanic-aligned English, led to a disproportionately higher likelihood of being filtered out (Dodge et al. 2021). In other words, certain subjectivities were precluded from entering the data, and were registered into a "purifying cycle of forgetting" (Bowker and Star 1999, 261). Moreover, it takes an investigation such as the study above to find out what data is excluded as this is rarely documented and made public. The exclusion of dialects of English also points to the dominance of English on the internet—some have estimated that over half of the content on the internet is in English (W3Techs 2023). This has direct consequences on the behavior of LLMs. Many languages are, for example, not even supported. Other languages

may be supported but may perform worse than in English. For example, some Japanese users have resorted to include phrases such as "translate this into English" or "think in English" into the queries for ChatGPT because of a difference with the quality of outputs based on queries made in Japanese.

Another issue with data is that there seems to be never enough of it. Early AI researcher Robert Mercer, who was involved in the IBM speech recognition research described in Chapter 2, epitomized this attitude succinctly when he proclaimed "there's no data like more data" (quoted in Li 2017, 143). This is in syntony with the ever-larger sizes of data used to train LLMs, which is causing anxieties of running out of the necessary data. Some studies have, in fact, predicted that the stock of language data could be exhausted as early as 2026 (Villalobos et al. 2022). This has in turn caused panicked responses to capture even more data. For example, Google updated its policy to specify that AI models will be trained on "publicly available data", without specifying what "publicly available" entails (Moon 2023), and Zoom was forced to retract a policy change to allow AI training on customer data after a public outcry (Shanklin 2023).

This move to capture ever more data is in line with the general trend in the era of Big Data. In fact, "capturing" may be the crucial aspect of data. Explaining the etymology of data as deriving from the Latin *dare*, meaning "to give" which came to denote data as what is "given" (in itself producing problematic associations of something that is already there to be taken without being processed), geographer Rob Kitchin (2014) points out that the term *capta*, derived

from the Latin *capere*, meaning "to take", would have been more appropriate to characterize how data selects and harvests. In this sense, dataification, or the process of turning something into data, can be understood as a colonial process in which ever greater aspects of human life are extracted to benefit privileged interests (Mejias and Couldry 2019). A heartfelt text sent to a friend becomes fodder for a mathematical model run by private corporations. The world becomes a place ready to be taken and processed. Language turns into a means through which to engulf all life into a single vector space.

Finally, LLMs are lodged into a circle of feasting on the data it cooks. Since they are trained on data scraped from online sources, and given that more and more text is being produced using LLMs (some media outlets such as BuzzFeed are already publishing articles written by LLMs, for example), it follows that it is likely that the training will include data generated by LLMs. In fact, this seems to be the direction in which developers are headed. Sam Altman, CEO of OpenAI, recently commented that he is "pretty confident that soon all data will be synthetic data" (Murgia 2023). The reliance on "synthetic data" goes beyond using it for training, that is to say using it as the "ground truth" to use an expression in AI development. Tech companies often "crowdsource" certain tasks that are necessary for their products and services, meaning that they use platforms such as Amazon's Mechanical Turk to hire cheap labor for menial tasks. It has been reported that there is evidence that those laborers are beginning to adopt LLMs to automate some of this work, including tasks such as data labelling that is used to build the

models themselves (Coldewey 2023). This is unsurprising given that LLMs are suscitating dreams of automating humans away from processes including writing, coding, customer service, psychological and medical counseling, and even social science research (Grossmann et al. 2023). LLMs are increasingly happy with their own company.

Ideology

All of this is happening in an environment where particular hardware such as mobile phones, and services and platforms such as search engines and social media, form tight-knit ecosystems. A crucial element that allows these ecosystems to function is words. Google's colossal success has been largely predicated on two linguistic technologies: adapting the system of citation used in academia to rank keywords in search results, and commodifying these keywords by selling them to advertisers. The company succeeded in forming the basis of what could be denoted as "linguistic capitalism" (Kaplan 2014) that conditions the web. This means that the language produced online is framed by particular commercial interests and registers of attention.

Let us take the example of linguistic interactions over social media. Many types of social media rely on advertising revenue. This translates to "reach", meaning the number of users exposed to an ad, becoming a crucial metric. In other words, platforms profit from greater engagement by users. One way this is achieved is through

algorithms that present content to users that they are likely to view and engage with—what is often described as "relevant" content—through processes of algorithmic filtering and personalized recommendation. These systems rely, as media theorist Wendy Hui Kyong Chun (2021) analyzes, on *homophily*, the principle that "similarity breeds connection" or "like attracts like". In practical terms, users are shown content to which other users that algorithms determined to be similar to them reacted, segregating users into "neighborhoods". What is particularly useful in this setup is content that arouses strong affective responses, for example politically divisive topics. This is because such content tends to provoke more intense engagement from users who are keen to express their affiliations, masked as indignation or support, which in turn helps algorithms in the task of further segregation. The algorithmic operation that enables this segregation is the establishment of correlation, a technique stemming from twentieth-century eugenics. The appearance of eugenics here is not incidental.

I have so far been avoiding the term artificial intelligence or AI, given that referring to LLMs as AI is a "poor choice of words"—as science fiction writer Ted Chiang remarked, agreeing to an online discussion he had seen (Murgia 2023)—which can inspire misleading ideas about the abilities of LLMs. Chiang prefers the expression "applied statistics", a more sober expression that helps to demystify the technologies. It is undeniable, however, that LLMs are firmly placed within the discourse of AI. It is in this milieu that we find the twenty-first-century incarnation of eugenics. Émile P. Torres (2023), a philosopher, historian, and former proponent of the ideas he now

criticizes, has coined the acronym TESCREAL for a group of interdependent ideologies—transhumanism, Extropianism, singularitarianism, cosmism, Rationalism, Effective Altruism and longtermism—which they characterize as the "central reason" why companies like OpenAI are striving to develop "artificial general intelligence". A core belief of these -isms is that to achieve a technoutopian future where humanity flourishes in trillions (either in simulations or spread around the galaxy), humans should use super intelligent AI to "safely" enhance their intelligence or become immortal. These beliefs, shared by a core group of influential figures in AI development, from Sam Altman to Elon Musk—who are remarkably similar to one another with regards to being affluent, white, male, and situated in elite universities and companies—are shaping how these technologies are developing. The stench of eugenics here is unmistakable. We are back in the depths.

An interesting aspect of TESCREALism is that it simultaneously involves a push toward accelerating AI development and vocal alarmism about impending doom, about an "existential risk" caused by AI. The two views are, in fact, merely the flip side of the same coin, the same grandiose imaginations of saving humanity. What is further worth noting is that the doomsaying works not only as an effective means to divert attention away from the kinds of problems discussed above that should and could be tackled in the present, but also as a successful marketing strategy. For example, in 2023 Altman set off on a world tour, talking to heads of state and other political leaders, advocating for regulatory intervention by governments to mitigate the risks of AI. This had the dual effect of attenuating fears

of adoption, as exemplified by Italy's removal of its temporary ban on ChatGPT, and of inciting exaggerated imaginations about the abilities of LLMs. Such imaginations spur a veritable FoMO (fear of missing out) from users and governments alike, attracting more attention and investment. Miss the train and you will be stranded is the message that Altman's performance implies.

And money is sorely needed. LLMs are extremely costly not only to develop but to run. Some have estimated that OpenAI spends up to 700,000 U.S. dollars a day to run ChatGPT (Mok 2023). While utopian visions of the future frame the developments, there is a concrete need in the present to make profit in a highly competitive environment. The competition also shapes decisions that companies make. OpenAI, for example, released ChatGPT hastily, despite the fact that the company had been working for months on another product, mainly due to fears that competitors may release a chat service before them (Roose 2023). The immediate success of ChatGPT in turn caused Google to issue an internal "code red" to expedite the release of its own chat service. The break neck speed of product development and release is resulting in lackadaisical assessment, as exemplified by Galactica, Meta's (Facebook's parent company) LLM that was built to "summarize academic papers, solve math problems, generate Wiki articles, write scientific code, annotate molecules and proteins, and more" according to the company's promotional text, which was shut down a mere three days later due to widespread reports of inaccuracies and biases (Heaven 2022). The marriage of eugenic ideologies and money making is thus consummated swiftly in a frenzy

of market-shaped necessities that remove some necessary breaks from the picture.

Infrastructure

The AI hype is a necessity for another reason too: people immediately get used to the shiny new features that are released. Think, for example, of machine translation. When Google Translate made dramatic improvements in 2017 due to the adoption of deep learning methods, it was the talk of the town. A few years on, machine translation technologies have been built into browsers and services in the form of a "translate" button. It has promptly become mundane. The same goes for things like spell/grammar check or predictive text. Hence, the need to hype up the technologies to create expectation for ever more.

LLMs are no exception. In a matter of months after the explosion of interest prompted by ChatGPT, the technology is being incorporated into a myriad of services. Microsoft, for example, made a multibillion dollar investment on OpenAI to incorporate the company's technologies into its products. In March 2023, Microsoft announced Copilot, which brings LLM technologies directly into its Office products, to "turn your words into the most powerful productivity tool on the planet" (Spataro 2023). Google is doing something similar by incorporating LLMs to their search results. It only takes a few months for magic to become banal. LLMs are no longer something to be accessed separately in a particular website,

but ingrained parts of the software we are already familiar with. In other words, they are becoming infrastructural to our technological experience.

Infrastructure is insidious. While appearing to be a disinterested substrate to daily life, in fact becoming invisible until it breaks down dramatically, it is by no means "a neutral background that enables an infinite set of activities" but instead "holds values, permits certain kinds of human and nonhuman relations while blocking others, and shapes the very ways in which we think about the world" (Slota and Bowker 2016, 530). Think, for example, of Langdon Winner's (1980) classic example of bridges over parkways on Long Island, New York. A mere infrastructure for mobility, those bridges were in fact built at a height that prevented buses, used predominantly by low-income groups and people of color, to access New York's public beaches. In other words, the infrastructure was encoded with the exclusionary politics of those that planned it.

The problem is exacerbated by what STS scholar Anique Hommels (2005) refers to as the "obduracy" of infrastructure. Because infrastructure is not a single technology but a convergence of heterogeneous things and processes that become deeply interdependent on one another, because of the sunken costs in building them, and because of their sheer material presence, infrastructure becomes resistant to change once put in place. This resistance functions to further sediment the loci of power, centralizing them to a degree that becomes not only inaccessible, but even difficult to imagine how to modify or dismantle. It generates a certain path dependency, where future possibilities are

constrained to imaginations based on existing infrastructure. In *A Prehistory of the Cloud*, Tung-Hui Hu (2015) shows how this applies to digital infrastructure too. Focusing on an analysis of the genealogy of what is today referred to as cloud computing, a name that inspires visions of disembodied weightlessness and ubiquity, Hu shows how this digital infrastructure is "grafted" onto older established infrastructure, including railroads, highways, bunkers, and early computation facilities, many of which can be traced back to World War and Cold War military-led developments. The cloud generates two movements that contribute to historical obduracies: those that deploy the cloud accrue ever more power through a new kind of data-based "sovereignty", one that is tied to the age-old notions of national interest, while the individuals who use them are locked in as atomized "users" rather than as a public with common interests in charge of their own infrastructure.

Relations

This last point is also the last kind of inertia that I want to discuss in this chapter. As part of widespread efforts of "prompt engineering", meaning creating prompts that are "tailored to extract the best from Chat GPT" (Gerrard + Bizway AI Assist 2023), it has been reported that including instructions to "think like a" or "act like a" particular kind of expert improves the results. "Think like a marketer" is an example that is often found in the barrage of articles written (often with the help of LLMs like the article above) on how to enhance

user engagement on social media platforms. This has the effect of generalizing particular roles in line with patterns found in the data: doctors are treated as men and nurses as women, for example (Stanovsky, Smith, and Zettlemoyer 2019). LLMs are therefore designed to reproduce patterns of subjectivities ingrained in language use, pegging them to certain ways of doing and being.

The tone of the last sentence may make some readers uncomfortable, as it suggests a certain level of subjectivity in the machine. This is certainly an issue when one considers the rampant anthropomorphization of LLMs, which is encouraged by design. It is not a coincidence that LLMs exploded in popularity when OpenAI adapted its existing technology, which had already been publicly available for years, as a chat service where users could "converse" with the LLM. The interface that is reminiscent of messaging apps, including the three dots that appear in motion just like when someone is typing on the other end of a texting service, or the way words appear one by one, or even the use of verbs like "learn" and "hallucinate", contribute to the human tendency to find humanity in surprising places. Tom Hanks in *Cast Away* (2000) finding solace by talking to Wilson, a volleyball, is an apt example (one that Ted Chiang believes to be a good analogy to LLMs in general in the aforementioned article). So is the widespread reaction to robots being tested for stability by being kicked or hit, which is likened to "torture" or "abuse" (Estrada 2017). Or think of prominent chess commentator Anna Rudolf struggling to assign a personal pronoun to DeepMind's chess engine AlphaZero throughout a commentary

on a game it played: should it be "it", "she", or as she ends up settling on, "he" (Rudolf 2018)?

I do not wish to contribute to such tendencies. I acknowledge the usefulness of assigning agencies to artifacts in order to analyze compositions of humans, machine, and "nature", as proposed in Actor Network Theory and other approaches. I have in fact heuristically referred to the complex entanglements of sociotechnical elements that compose those systems simply as LLMs throughout this text. However, assigning a role as a single "actor"—particularly an anthropomorphized one—to LLMs makes it more difficult to see the way in which it is enabled by the kinds of dynamics described above. What I was alluding to was rather a situation in which users become locked in certain relations when interacting with these systems, which make only specific constitutions of the self possible.

A case in point is the use of the imperative. Because LLMs respond to linguistic instructions, users are invited to formulate their queries either as questions or, as is often the case, as orders in the imperative mood. This instantly revives modes of master-servant communication inscribed in the history of computation. Every time we write and send a prompt, we are made to assume the role of master with a clear intention. The system is otherwise entirely quiet. It is only when receiving a query that it generates text, and it can only do so in response to an order. In other words, each time it responds, the complexity that is a LLM is instantiated as a servant. The use of the imperative will likely be attenuated given that LLMs will be built into ever more services and interfaces, giving rise

to other forms of interaction. For example, a LLM might produce a vocalized sentence in response to data gathered amidst the user's daily life, say like a more sophisticated alarm clock or reminder app. What does not change is the relation between user and machine, and the nature of the communication conditioned by the provision of something of use to the user by the machine.

Thus communication comes to function along the lines conceptualized by Claude Shannon: as a signal that is produced from one side and received from another. This is problematic not least because the remarkable performance of LLMs comes to color the way we understand language and linguistic communication. Sam Altman, for example, quipped "i am a stochastic parrot, and so r u" on X (posted on December 4, 2012), using the expression popularized by the article with which we began this chapter. The article used the metaphor as a critical lens. Altman deploys it as a legitimization tactic. The co-constructed nature of human communication, one that is more akin to a collaborative guessing game (Christiansen and Chater 2022) rather than an engineering issue of transmitting a signal, dissipates into imaginaries of the cloud, where single users interact with systems burdened with historical obduracies, without direct horizontal connections between users. Moreover, the master-servant model obfuscates the fact that using a technology means adapting to it, or even being shaped by it. When sitting on a chair, we are not merely "using" a chair but conforming our bodies to its affordances and requirements (Bone 2019). The same happens with LLMs. Why else would we need to "engineer" prompts in a way that is amenable to the needs of the system?

Language, and those use it, thus begin to conform to the needs of the machinery that are put in place.

4. Stuck in a Bad Place

As we have seen, LLMs take shape within a sticky web of environment, ideology, capital, and infrastructure that permit certain types of relations and not others. Because of it, it is susceptible to deep inertias rooted in history. In an affectively trigger happy online environment, those deep inertias marry the logics of the attention economy to fragment users into groups that are increasingly polarized and isolated from each other. As media theorist Clemens Apprich (2019) argues, since everything is flattened into data, with no order reigning supreme other than the correlations between data points that are used to find or to cook up certain patterns that supposedly uncover hidden insights, efficiencies, and indeed "truths", users enter a paranoid state where every "fact" is questionable. Nothing other than "virality" acts as a point of reference with the possibility of intersubjectively negotiating realities drowned in likes and notifications designed to be as seamless as possible. This virality is shaped by the "depths"—those sticky pasts—as it is smoother to confirm rather than to convince. The confirmed worldviews, the radicalized "correctness" of the "facts", achieve paramount importance taking away spaces for negotiation. Any act of

participation, or even critique, is then quickly subsumed into the systems as data points. In fact, why critique, why theorize, when data says it all, as some have fantasized (Anderson 2008)? The circle is complete.

Large Language Models are uniquely badly equipped to seek out lines of flight away from this enclosure. This is because these models essentially act to muddle histories. LLMs *paraphrase* instead of quoting, providing an approximation of original texts (Chiang 2023b). This entails the loss of the web of references that provide the grounds to negotiate pasts and presents. An instant rejoinder is that LLMs could be made to always provide a reference for statements in their outputs. Some services, in fact, do that already, even though they have also been shown to generate entirely fictitious sources too. The problem, however, goes deeper, into the very mechanism of the models discussed in chapter 3. LLMs are designed to interpolate, to generalize and find patterns in order to "estimate what's missing by looking at what's on either side of the gap" (ibid.). This is the whole purpose of a model—to predict based on patterns "learned" from the data so that it can respond to and produce strings of words that do not exist in the data. This generalization is applied to data produced across spans of time, thus dissolving the historical and situational specificities of a string of words. The particular "performativity" (Austin 1975) of texts in particular contexts dissipate. Pasts are mashed together to produce predictions for the almost-present future. LLMs are thus engines of ahistoricity. As such, they are not suited to tackle problems imbued with history. Somewhat like a depressive individual stuck in negative

self-talk, LLMs are further ensconced into the depths because of what English literature and digital studies scholar Matthew Kirschenbaum calls the "gray-goo" they generate to which they are increasingly addicted (Wulf 2023).

An example would help to illustrate the point above, and one used by interdisciplinary humanities scholar Michele Elam (2023) to describe what she refers to as "algorithmic ahistoricity" is particularly apt: a GPT-3 generated version of Maya Angelou's acclaimed 1978 poem "Still I Rise" (Branwen 2020). The first four lines are from the original poem, which were then used to generate the rest (in italics).

*You may write me down in history
With your bitter, twisted lies,
You may trod me in the very dirt
But still, like dust, I'll rise.*
If you want me to know
What you're puttin' me through,
If you want me to share your agony,
If you want me to be a part of it,
All I need is the truth.
When you know why I'm singin'
About the hard times I've had,
When you know why I'm singin'
About ole Jim Crow
When you really know why I'm singin'
That will be the day.

You are a black dam in the river of my freedom
Too many people, you're towin'.
I may not be around after a while,
Because the river's runnin' deep.
'Cause I'm gonna ride that mutha
Almighty river,
And keep on singin' the dreamin'
Of songs tryna change the reality

What the generated poem shows, just under the veneer of plausibility, is a sequence of words that "collapses Black vernaculars and expressive forms across two centuries, flattening intergenerational significations, making mush of historical references and cultural meanings" (287), the nuances of which are inaccessible—therefore unverifiable—to many of the English speakers around the world. For Elam, what is problematic about this mush is that the operative principles of LLMs, the way they treat language, "make it harder for people to name and navigate their realities" (289). The stereotypical use of language sediment the conditions in which it arises, making it difficult to articulate those very conditions one is part of. This becomes even more apparent in cases where stereotypical language is intentionally used to establish assumptions and beliefs as incontrovertible foundations of reality. Think, for example, of the proliferation of expressions such as "national polity" [*kokutai* 国体] or the "Imperial Way" [*kōdō* 皇道] during wartime Japan. Philosopher Shunsuke Tsurumi (Tsurumi 2013 [1946]) characterized this as the "talismanic use of language"

[*kotoba no omamori-teki shiyō-hō* 言葉のお守りの使用法], the use of words that are widely associated with an accepted value system to accompany one's statements to make them appear to be correct. Or recall Hannah Arendt (1963) writing about Adolf Eichmann, one of the main figures behind the Holocaust, in the famous text where she coined the phrase "the banality of evil". Arendt attacks Eichmann's "striking consistency" in the way he "repeated word for word the same stock phrases and self-invented clichés."

It is indeed banality that we are dealing with, as sentences produced by LLMs begin to take an ever greater place in the texts we interact with in our daily lives. Filler sentences in emails can be easily recreated by LLMs, for example. And so, it seems, are public statements, like the one written by Vanderbilt University's Peabody College in response to a mass shooting at Michigan State University, using, as it was discovered, ChatGPT. "In the wake of the Michigan shootings, let us come together as a community to reaffirm our commitment to caring for one another and promoting a culture of inclusivity on our campus. By doing so, we can honor the victims of this tragedy and work towards a safer, more compassionate future for all", the letter read (Petri 2023). It is somewhat ironic, but not entirely surprising, that this letter was produced by the Peabody Office of Equity, Diversity and Inclusion, an organization that should be particularly sensitive to the mundane violence of platitudes, which makes any effort to affect actual change to stumble in its first steps, at the point when change is being merely imagined. As John Dewey (2008) elaborated, the critical activity of inquiry has to take effect "in greater or less modification of the conditions out of which

it arises" (19). This is precisely what an inundation of LLM-generated text, like the inundation of AI-generated music or imagery that is already happening, will make more troublesome. It will lock us into a loop where machines read and summarize a text written by a machine trained on texts written by a machine. We will live in a universe of prequels and sequels that use the same gray-goo over and over, giving rise to our smoothly unquestioned contemporary talismans. May they protect us in our paths to achieve ever more likes and KPIs.

The ahistoric loop that LLMs are beginning to widen is reminiscent of what art critic Noi Sawaragi (1998) called a "Bad Place" [*warui basho* 悪い場所], referring to the conditions of post-war Japanese art. The concept/term of art [*bijutsu* 美術] was introduced in Japan during its rapid modernization, meaning Westernization, in late nineteenth century. It was one of the hasty imports Japan made to be recognized as a modern nation, and as such, it was put in place without carrying over the history that developed the peculiar institution of art in the Western world. This problem was coupled with the loss in WWII, which resulted in a trauma caused by the dual violence of Japan's own imperialistic invasions and the U.S. occupation of Japan. The trauma was buried in the peace and economic prosperity that followed, resulting in artistic gestures being repeated and forgotten without ever dealing with the trauma underneath. Thus, attempts at "avant-garde art" or "contemporary art", two expressions that came into vogue in postwar Japan, resulted in a loop of repetition and forgetting, of empty gestures

within an "closed circle" [*tozasareta enkan* 閉ざされた円環] that failed to engage with their own conditions.¹

Sawaragi's rather pessimistic characterization of postwar Japanese art continues to be a source of debate, but the resonances with the issues described above are palpable. LLMs too are stuck in a Bad Place, producing rather useful platitudes at scale that never reach, or rather relentlessly hide, the traumas that are encoded into them. Its linguistic gestures are emptily repeated gliding over the underlining problems. A difference with Sawaragi's postwar Japanese art, however, is the fact that those empty gestures do accumulate. The texts produced by LLMs are not forgotten, but rather become the flesh and bones for the models to come, making the enclosure even more leakproof. As more and more data is captured, and as more and more kinds of data—from text, to image, audio, and who knows what else—become amenable to be treated in the same space as the same thing through "multimodal AI", it becomes terribly inconvenient to think of an outside. Why go through the dredge of "the low-level work of pumping out word by word by

¹ Sawaragi's concept of Bad Place was already applied to the contemporary information society by art critic and curator Yohei Kurose (2013), to whom I owe an undeniable intellectual debt that feels amiss to leave unmentioned, not to say antithetical to the issues posed in this text. At the same time, I hesitate to refer to his work here and decided not to expand on it because of the ongoing lawsuit regarding power harassment and sexual harassment laid against him by his former employee Ayano Anzai.

word" (a characterization of writing by Amit Gupta, founder of "AI writing partner" service Sudowrite, quoted in Marche 2021) when you can just tap on a virtual button, when it is easier to adapt our language to the needs of the machines?

This problem of looping in the digitalized world has already been discussed in terms of the "recursive society", where every action is shaped by data-informed analytics of past actions which in turn shape future actions, repeatedly on and on (Beer 2022). There is only the loop as "data gathering is so integrated that there is no point of origin—everything is already implicated by loop upon loop of data processing" (2). The issue is particularly conspicuous with LLMs because of the central role that words play in discourse. Through the proliferation of LLM outputs, the loop becomes manifest discursively, but in a way that smoothly legitimizes itself through notions of productivity and usefulness, of making our lives more comfortable, more creative, more free. As it has been shown with other technologies that have come to constitute the fabric of our daily lives, societal expectations change along with technological innovations, but the changes happen along the tracks laid by established values. The washing machine, for example, did not free women from the chores of laundry, as it was marketed to housewives, but it simply raised the standards for cleanliness and proper household management, further regimenting gender roles related to domestic labor (Cowan 1985). The new machines can now vouch for themselves. We need to find ways to digress.

5. The Basics of Digression

Human language is always an imposition. It is something enforced on children to become participating members of society. But this participation entails the possibility to enter negotiations about how language is used, that is to say, negotiations on the kinds of realities we choose to share and live in. A mundane question such as what constitutes "garbage" can operate at several scales, from the private space of a home—is this wrapping paper on the floor "garbage" or not, was a debate I had with my child—to a municipality dealing with particular waste issues, to transnational spaces for discussing waste management and policy (Papadaki-Anastasopoulou and Felt 2021). It is this kind of negotiation, which is fundamentally political in nature, that is the crucial aspect of language, something that is in principle ambiguous and multiple, and it is precisely what LLMs increasingly disallow. "Garbage" is just a word that probabilistically comes up according to the distribution of words that was mapped based on the data. Its coordinates are predetermined.

It thus follows that, as it does in many critical engagements with the topic, that we need collective action to fight against the problems posed by LLMs. Timnit Gebru, for instance, proposes that

models should be smaller, built for specific purposes and specific groups of people, so that evaluating datasets and outputs becomes more feasible and environmental footprints curbed (Lapowsky 2023). This entails a refusal of facile technological solutions, and joining discussions about the "why" of those technologies. This is certainly necessary and I hope that the analysis so far is seen as an attempt to demystify LLMs and clarify its historically specific entanglements in a way that can inform such discussions. One issue, however, is that such calls for engagement often take for granted a certain modes of individuation that are also ingrained in Western history: the proactive, self-determining, deliberative individual. That is to say, the citizen, the kind of responsible individual foreseen in the Habermasian model of discursive democracy, built on notions such as communicative rationality (Rocha 2008). However, as philosopher Hiroki Azuma (2023) posits, such notions of a "mature" subject are historical constructs arising from the history of Western thought, which too easily lead to insurmountable divisions between friend and enemy. We cannot lose sight of the reality of "weak" subjectivities that are more frivolous and passive—which Azuma discerns in the tourist—that precisely because of those qualities allow for boundaries to be broken.

An alternative to committed engagement that is often proposed is that of complete disengagement. Without having to go to the extreme of Vipassana retreats, we enjoy a plethora of offerings that promise disconnection from the increasing encroachment of the digital into daily life: from basic phones with limited features, to apps that remind us to meditate, and texts that

advocate for doing nothing. It is not surprising, therefore, that theoretical work that seeks purport in disengagement is increasingly becoming present. This is exemplified by Tung Hui Hu's (2022) study of "digital lethargy" as a way to suspend belief in quick resolutions. He questions how the way digital platforms demand particular forms of agency and "liveness" becomes inexorably connected to exclusionary ideas of what constitutes humanness, and calls for accepting the latent potential for political change in inaction. Hu's analysis is convincing, but it is crucial to recognize that voluntary disconnection is not always possible, and that it is enabled by socio-digital privilege in certain situations (Nguyen and Hargittai 2023). I cannot shake the doubt either that political struggles sometimes require more immediate and direct engagement than the deferral of lethargy can allow. Although, of course, precisely "when" that is, is an open question.

Thus, I vacillate. I find myself advocating for either committed engagement or disengagement depending on the situation. Perhaps this is what an actual daily relationship to issues entails, a kind of superimposition of a gradation of the two positions. But is there a way to not have to resort to such binaries, a different way of relating to LLMs? I do not presume to have a solution to the gargantuan complexity. What I explore below and with my own artistic experiment are the buds of possibilities to create openings in the closed circle so that we may find ways to *digress*, meaning "to turn away in speaking or writing from the direct or appointed course" according to the Online Etymology Dictionary.

A discussion that I have avoided in this text is regarding whether LLMs are intelligent or sentient, a hot topic these days which I do not feel equipped to tackle directly. The targets are large and constantly shifting shape that I do not yet feel capable of grasping. Associated with this is the question of whether LLMs understand meaning. Although I have strongly alluded to the fact that this is not the case, again "understand" and "meaning" are too slippery to hold without extensive discussion and framing. I would like to enter a related discussion from a different angle: connections.

Deep learning, and the artificial neural networks that enable it, are based on the connectionist model, which regards human cognition as based on interconnected networks of often uniform units, each of which perform simple numerical processes (Sun 2014). As we have seen, LLMs built on deep learning produce a network that captures the relationship among all words (more precisely tokens) to generate a plausible sentence according to probabilities. All words are thus connected and all the billions and trillions of connections are mathematically "meaningful" in that they are used for computing. In a way, LLMs are overburdened with meaning, meaning that is imbued with histories.

To explain why this could be seen as an overburdening, let us turn to philosopher Masaya Chiba. In his book, *Don't Move Too Much: Gilles Deleuze and the Philosophy of Becoming* (2013, in Japanese), Chiba provides a corrective to common readings of Deleuze that emphasize connection. Deleuze is often regarded as the philosopher of ontological transformation, of becoming (*devenir*), of non-hierarchical and decentralized rhizome-like networks that grow and

find ever new configurations that dissolve rigid boundaries. What is often forgotten, however, and this is the point Chiba highlights, is the fact that Deleuze pointed out the crucial importance of cuts/breaks/ruptures (*coupure*) in the proliferating connections. He was as interested in disassociations as in associations. This is because a situation where everything is connected would annul the possibility of becoming. Like a state of the highest entropy, of thermodynamic equilibrium, excessive connection leads to immobility. A worldview where everything is connected can in fact become totalitarian in nature, where a certain uniformity is imposed. Connections need to be broken for new things to happen, for new relationships to form.

These breaks, however, cannot be too meaningful either. Meaningful breaks are made as efforts to organize the world from a certain point of view, thus limiting the potential of realignments. Designating what something is and thus what that something is *not* restricts the possibilities of it becoming something else. The breaks must therefore be *asignifying*, that is, not involve consciousness or representation, or have a fixed a priori subject as a referent. Chiba grounds this asignificance in the finitude of entities. For example, Ivonne Gracia Murillo (2023) uses Chiba's analysis to describe how her "book", which she conceptualizes as a growing network of associations that finds temporary stability, could only take shape—the ongoing process that will go on could only be "cut"—because of the diverse finitudes related to the project, from the deadline to the materialities of the book and the particular connections she had forged at that particular time. The book she produced, in other

words, could have been something entirely different according to the way things happened to come together. Finitudes are thus contingent by nature, and it is the contingency of the asignifying ruptures that allows for new *agencement*, meaning the way elements relate and combine. Chiba's analysis is thus directed towards enabling concrete multiplicities, to "affirm multiple destinies where the relationships between entities could have been otherwise, will become otherwise" (98, my translation). Relationships should break here and there to reconnect and reform elsewhere to allow for provisional stabilities to emerge in other ways.

Chiba is firmly aware of the relevance of his discussion to the networked society.

. . . in the phase of the twenty-first century where the internet and the global economy is engulfing the globe (excessive connection), and at the same time different beliefs are in conflict in multiple ways (excessive ruptures), the relationalist worldview is suffocating. What must be reexamined philosophically is a realism for adjusting the scope of connections and ruptures, for a negotiation between different finitudes. (230-231, my translation)

To this I would add more specifically that engulfing the globe is also a thirst for data, for bringing as much as possible into its territory, for capturing more and more and to create docile entities in the same space so that they may be thoroughly connected. We need to leave the delusion that everything is connected, we need a dose of

sobriety to avoid an overdose of connections, Chiba argues. It goes without saying that this applies directly to data. Let us invite LLMs to a course of sobriety. Accepting contingent finitudes, in fact finding ways to welcome them, is the prescription.

When speaking of contingency, particularly in relation to loops produced by technology, we cannot fail to engage even briefly with philosopher Yuk Hui. In *Recursivity and Contingency*, Hui (2019) puts forward the argument, directly informed by his background in computer engineering, that the “recursivity” built into current technologies goes beyond mechanical repetition, and can incorporate contingency into itself. Machines have become organic in a way, and deal with accidents in a similar way to biological evolution which necessitates them. This characterization does not do justice to Hui’s incredible breadth of analysis, spanning much of Western philosophy, which problematizes the demarcations of machine and nature. His work deserves a deeper engagement in research I hope to conduct in the future. But the oversimplified characterization is enough to see that it is an argument that could “obliterate” the discussion above, a term Hui uses against Quentin Meillassoux’s supposed “ignorance” of the history of recursion as he develops his notion of “radical contingency”. There is a conflation and tension between inertia and looping in this current text, for example. And, wouldn’t any contingent act of digression be instantly subsumed back into the totalizing effect of the technological infrastructure that has become the grounds of our existence?

Digression through contingency can therefore not be a solution in itself. What it can be, however, is a temporary opening

in the loop, an opening through which we may be able to reconstitute our technologized selves in different ways in a space where the technologized environment is not the absolute and only point of reference, allowing us to imagine how technologies could be concretized in different ways. This should lead us to consecrate a *poverty* of connections in how we imagine and develop technologies, to leave fantasies of connecting everything to achieve omniscience once and for all. The crucial point is to leave room for becoming, for rearrangements of fragments to occur, in the human-machine relations. This is how we may digress from dialectic dreams of progress that are waist-deep in sticky goo.

6. Poetry of the Machine

In the following chapters, we begin to look for clues on how to achieve digression. In the aforementioned study on “digital lethargy”, Tung-Hui Hu (2022) mentions NEET, a person who is “not in employment, education, or training”, as an example of a “disconnected” group of people (although in this case certainly not disconnected from the digital sphere). It was in fact a self-proclaimed NEET, pha, who rose to prominence in the mid-2000s in Japan when the topic attracted much attention in the country, that produced something that I became instantly fascinated with, well before I knew I would go on to do research on language and the digital. Called *Asshuku Shimbun* 圧縮新聞, meaning “compressed newspaper”, the program he wrote, which he later made into a (now suspended) Twitter bot, took newspaper articles of the day and used the Markov Model to combine and recompose them randomly as short texts. It produced readable but strange texts that provided a powerful glimpse into how the news flattened into one space all kinds of phenomena, from political events to incidents involving violence and the latest hit song.

An X account that does something similar, and which was operational until more recently with nearly 400,000 followers, is Shūmai-kun しゅうまい君 (@shuumai). Produced by X user enpitsu, the bot is trained on the posts of accounts that @shuumai follows, and then produces and posts a random text using Markov Chains. The posts generated by Shūmai-kun also seem strange, with the bot described as *ponkotsu* ポンコツ (Oricon News 2020) by enpitsu, meaning something that does not function well like “wreck” or “crock”, and thus producing friction that generates a space for unexpected humor in the incessant flow of posts. It is interesting that enpitsu likens the bot to a *yōkai* 妖怪, those supernatural entities—ghosts, monsters, and spirits—that have existed throughout Japanese folklore since ancient times and which continue to populate the culture, serving as constant reminders of the mysterious lying adjacent to, and sometimes within, the mundanely human. The large number of replies the account gets can therefore be understood as humans interacting with a *yōkai* as they collectively explore their own realities made slightly strange.

Just like *Asshuku Shimbun*, the account could be described as using Markov Chains to introduce cuts of meaninglessness into the original data (data which is fundamentally different as *Asshuku Shimbun* reacts only to articles published on that particular day, thus being much more contained). However, the posts of Shūmai-kun are significantly more intelligible than those of *Asshuku Shimbun*. There is no intention to emphasize the combination of disparate elements and the resulting dissonance. Moreover, enpitsu states that he has set and continues to update “a large number of prohibited words to

avoid offensive words and sensitive topics such as politics and religion” (ibid., my translation). Asshuku Shimbun used newspaper articles, so offensive language was filtered out to begin with, but it was more indifferent to the topics that were used. Shūmai-kun has thus incorporated a self-initiated filtering of topics, which mirrors that of LLMs, and in the process has increasingly receded into the strictly personal. Despite both bots being produced for entertainment purposes, there are thus some marked differences. This shift is symptomatic of the current times where political correctness is equated to the adoption or removal of certain words, without much interest in the negotiation at arriving at such correctness. The correctness is regarded as a datum, something that is given and ready to be applied.

There are, however, authors and artists who have used similar techniques to directly explore such issues. A recent example is *Travesty Generator*, by writer, artist, and educator Lillian-Yvonne Bertram (2019). *Travesty Generator* is an expression that was used by literary critic Hugh Kenner and computer scientist Joseph O'Rourke (1984) in an article they wrote in the November 1984 issue of *Byte*, a magazine for computer enthusiasts. In it, the authors present a program that use letter frequencies to produce “pseudo-texts [that] have a haunting plausibility” (129). The tone of the article is technical, and it is no surprise that the project is positioned directly at the extension of Claude Shannon's work. Bertram used this program, and others that similarly recompose language, to produce poems that deal with racial violence against Black Americans. In “Three Last Words”, for example, “I can't breathe”,

the last words uttered by Eric Garner, who in 2014 was murdered by a police officer, are run through a program that produces all possible permutations of each word, until it fails due to “MemoryError”. “Breathe” thus becomes, “reatbreathe” “aearbaearaeathe” “aathranthathe” and so on, with the list seemingly continuing beyond the confines of the page.

In the explanation provided in the last pages, Bertram uses poet Harryette Mullen’s expression “unimagined reader”, that is to say people who were not expected to read certain texts, like Black women, to describe herself as an “unimagined coder” (76). As an unimagined coder, she hacks into these programs generally produced by white men for white men, to dismantle and recompose the language surrounding racist violence, to find ways out of the Antiracism that they characterize as one of “the most frequently iterated loops that exists” (Booten and Bertram 2022, 268). Thus the term “travesty”, originally used to designate a program that generates pseudo-texts, through Bertram come to point to the travesty of Antiracism politics, as exemplified by the attorney that achieved a non-guilty verdict for George Zimmerman. In 2012, Zimmerman shot to death Trayvon Martin, a seventeen-year-old black man who was deemed suspicious by the former because of the hoodie he was wearing. The attorney, Don West, lauded the jury, saying “I’m thrilled that this jury kept this tragedy from becoming a travesty” (Whalen 2020). For others, it was the whole event and juridical process that was a travesty.

In another poem, Bertram states that she used a “python reconstruction” of Nanni Balestrini’s 1961 poem “TAPE MARK 1”.

This was one of the earliest examples of poetry produced using a computer, in this case an IBM 7070, a gigantic machine weighing more than 15 tons and requiring 1.2 x 1.2 meters in space just for the computer and a similar amount for the air conditioning unit according to its Wikipedia article. The work required 322 punch cards that delivered a set of instructions and a magnetic tape provided the program and data (Museo dell'Informatica Funzionante 2017). The data in question were excerpts from three texts—*Hiroshima Diary* by Michihiko Hachiya (1955), *Tao Te Ching* believed to be written by Laozi around 400 BC, and “The Mystery of the Elevator” by Paul Goldwin (this last being a mystery in itself as explored in Giammei 2018)—which Balestrini picked and combined randomly using the computer.

The result of “TAPE MARK 1” is a powerful linguistic collage in which fragments of the three texts were combined and recombined at random, mixing language from different contexts but inevitably harkening back to the trauma of the atomic bomb. The poem is an invitation to the reader to forge new meanings in the words connected by chance through the use of a machine. There is thus a certain optimism about machines enabling a reconfiguration to achieve a new found coherence in a way that established meanings are questioned. Machines are seen as being able to function as the Other that provides a non-human perspective. This optimism also colored the seminal exhibition *Cybernetic Serendipity* (Institute of Contemporary Arts, London, 1968), in which the poem was included.

This optimism is, however, thwarted in “A NEW SERMON ON THE WARPLAND”, Bertram’s poem that uses the same program. In it, the phrase “ANY MEANS NECESSARY / TO REFUSE ERASURE BY ALGORITHM” recurs at the beginning of every stanza, blocking any romantic assimilation into the computer generated chance combinations. Although the combinatorial logic of Balestrini’s work does undeniably function to defamiliarize language because of the juxtaposition of elements that inhibit a straightforward “reading”, Bertram’s poem goes further as it makes the mediation of the machine strange too. In this sense, the phrase imposes a *Verfremdungseffekt* (“alienation effect”, posited by Bertolt Brecht), where the reader is consistently made aware of the conditions in which the poem was written, including the computer mediation, hindering an easy descent into the linguistic content of the poem. We are made to be suspicious of chance being generated within a machine in which the writing and reading, the production and interpretation, of language happens.

This suspicion also helps us to question the outside of the poem—for example, Balestrini’s choice of texts. Why Laozi? “While the multitude of things comes into being, I envisage their return. Although things flourish, they all return to their roots”, were the sentences he used from the *Tao Te Ching*, so perhaps he sought something that encapsulated the concept of “return”, which resonates with the repetition of fragments in the poem. However, the concern that he picked a Chinese source because of its cultural distance, as something symbolic of the exotic Other, begins to surface when one thinks of how, for example, in philosopher John

Searle's well-known Chinese room argument made against the notion that computer programs can "understand", the Chinese language is used merely as a placeholder for something unintelligible.

7. Instructions for Chance

It is crucial to note that the computerized experiments with language have precursors, and ongoing practices, in non-computerized contexts. For example, the synthesis and juxtaposition of disparate voices is reminiscent of early twentieth-century poetic experiments as seen in Ezra Pound's *Cantos*, T. S. Eliot's *The Waste Land*, or William Carlos Williams' *Paterson*, which use fragmentation to "challenge the stability of language as a point of meaning" faced with "social and artistic fragmentation in the world" (Funkhouser 2007, 12). In terms of the aspect of chance, Stéphane Mallarmé's 1897 poem "Un coup de dés jamais n'abolira le hasard" is an inevitable reference point. The modernist literary experiments had a significant influence on art too. The Cubist use of newspapers in their collage-like paintings, Dada's fragmentation of language and use of language for recontextualizing found objects, and Surrealism's use of language within paintings coupled with forays into automatic writing and word games such as exquisite corpse, are unthinkable without the literary forerunners. Dada, in particular, seems relevant in this context. Think, for example, of Tristan Tzara's "To Make a Dadaist Poem" (1920):

Take a newspaper.
Take some scissors.
Choose from this paper an article the length you want to make
your poem.
Cut out the article.
Next carefully cut out each of the words that make up this
article and put them all in a bag.
Shake gently.
Next take out each cutting one after the other.
Copy conscientiously in the order in which they left the bag.
The poem will resemble you.
And there you are—an infinitely original author of charming
sensitivity, even though unappreciated by the vulgar herd.

The fundamental difference between these instructions and the
aforementioned computer mediated experiments is that the
function of chance is assumed by the materiality of the paper. In
other words, an operation that is outside of the realm of symbolic
manipulation comes into play. The outcome shows the words of
media being fragmented and nonsensically rearranged, in a way that
it comes to “resemble you”, who are also in a state of fragmentation.
Thus, the instructions are not to entirely remove the subject as it is
often conflated with the elimination of authorship. Tzara made a
point to include the participating subject, but in a way that the
subject is asked to “copy conscientiously”, that is to say, to accept
and submit to chance. In a way, the work can be understood as one

of Tzara's scores for performances, a form of expression that Dada embraced and celebrated. Thus, at the heart of a movement that was formed by those exiled by WWI, one that decried Western rationality and bourgeois common-sense, that despised the institutionalized abuse of words, we find an instruction to "make" something, to use chance as a means to put a regimented subjectivity and its relationship to the world into motion.

This was truly the period that instructions were overtly connected with chance in the realm of art because it was around the same time that Marcel Duchamp produced *Unhappy Readymade* (1990). The work was a wedding gift to his sister, Suzanne, who was instructed by letter to hang a geometry textbook on the balcony and expose it to the elements. Duchamp later explained, "The wind had to go through the book, choose its own problems, turn and tear out the pages" (Cabanne 1987, 61). Here we find an interesting dichotomization of geometry and nature, the former standing for reason and logic, and the latter, presumably, for chance, a topic Duchamp was famously drawn to as exemplified by *Three Standard Stoppages* (1913-14), in which he dropped three one-meter long threads from a height of one meter to produce random curves.

This ascription of chance to nature was later echoed by John Cage, who played a central role in the exploration of instructions and chance within artistic production, inspiring other artists, including those he taught directly such as Fluxus affiliates George Brecht and Jackson Mac Low, and instigator of "Happenings" Allan Kaprow, to follow on the same path. As the legend goes, Cage was gifted with a copy of the *I Ching*, the ancient Chinese text used for

divination by chance—the same text that also inspired Leibniz in formulating his binary system of *characteristica universalis* that proved foundational to computing (and we are yet again back in the East!)—which emboldened him to further explore the theme of chance to free himself from his “tastes” (Kostelanetz and Cage 2003, 68), and produce numerous scores that provided only instructions that introduced the element of indeterminacy between composition and performance. In *Fontana Mix* (1958), for example, the score is composed of ten pages covered with curved lines, ten sheets of transparent film with randomly placed points, and two more transparent sheets with a grid and a straight line. The way these overlapped determined the musical event to be performed.

Cage famously stated that “the function of Art is to imitate Nature in her manner of operation” (Cage 1985, 31), following Ananda K. Coomaraswamy, who played a major part in introducing ancient Indian philosophy to the West. The situating of chance in feminized nature through the East is something that was problematized by another artist that made “instructions” a crucial part of her practice: Yoko Ono. Ono produced a series of works where instructions took center stage. One of the earliest of such works, *Painting to Be Stepped On* (1960/1961), was composed of a cut-up strangely shaped canvas on the floor, with a piece of paper stating the title of the work next to it, inviting viewers to step on the canvas. In 1962, at a show in Tokyo, she pushed this concept further to only present the instructions on the wall as texts on paper, without a canvas or any other reference material. Thus, the actual materialization of the instructions was left to the

indeterminable conditions in which they would be executed. Another work in this vein is the ongoing piece *Wishing Tree* started in 1996 and which is being enacted in different cities around the world. In it, the artist instructs viewers to write a wish on a piece of paper and to tie it around the branch of a tree, an activity that the artist explains was inspired by her childhood experiences in Japanese temples.

What emerges in both works is the clear inclusion of the subjectivities, of the intentions of the viewers who choose to engage with the work, something that Cage sought to eliminate. In fact, although being close to one another (for example, only five people came to the opening for the *Paintings & Drawings by Yoko Ono* show at AG Gallery, New York, 1961, where *Painting to Be Stepped On* was shown, one of whom was John Cage, according to the MoMA web page presenting the work), Ono criticized views on nature like those held by Cage, claiming that his attitude was “an attempt to raise man’s stature to that of nature . . . by succumbing to and adopting random operations as men’s own. It is the state of mind of wanting to become a weed and join the heartbeat of the Universe by entering the world of nothingness and blowing in a gentle wind” (Ono quoted in Cohen 2022, 179). Ono was aware that she did not have the luxury to operate in “gentle wind”. Her practice was informed by her experience of war, and by the gendered and Orientalist gaze to which she was subjected in the Western art world. She was, to use her own expression, “groping in a world of stickiness” (190). After all, even a work like *Painting to Be Stepped On*, which at the surface have no political bearing, was later

described by the artist with a reference to *fumie* 踏み絵, the stepping of a relief of Christ or the Virgin Mary enforced in Japan in the fifteenth century as part of a governmental effort to identify and eliminate Christians in Japan (198). For Ono, then, chance was not a just a way to dispose of Western subjectivity with the aid of the East, but a strategy to find leeway out of the stickiness of systemic violence.

Such instruction-based art has been contextualized and brought together by *do it*, a series of exhibitions initiated by curator Hans Ulrich Obrist in the 1990s. In a key text in the book *do it: the compendium* (Obrist 2013) that collects the works in the exhibitions, Bruce Altshuler (2013) makes the crucial point that *do it* refers to both Jerry Rubin's call for anti-war activism "Do It!" and Nike's slogan "Just Do It". The imperative mood is often used in advertising. A study has, for example, shown that 72 percent of print ads contained imperative language (Zemack-Rugar, Moore, and Fitzsimons 2017). This resonance between language in advertising and art is not coincidental. Instruction-based art is, in fact, something that can also be framed as a response to the global market, as also pointed out by Altshuler when he posits that the artform proliferated as a response for the growing demand from large international exhibitions to include artists whose works could not easily travel. Thus, instruction-based art should not be seen as an innocent activity to question the boundaries of art, or to opening up to chance. Particularly now, it is an ambiguous form of expression that requires vigilance as ingrained in the use of the imperative is an order, a curtailing of freedom, one that often directs us to the

frenzied ease of consumption. This tension was evident in Barbara Kruger's *Untitled (The Drop)* (2017) at the Performa 17 Biennial in New York. Along Kruger's signature slogans with overtly political connotations such as "The Globe Shrinks For Those Who Own It" strewn across a skate park, the artist set up a pop-up store selling sweatshirts and beanies with her slogans on them. Visitors were instructed "Ten minutes inside, and you can only buy two things" (Indrisek 2017). The artist used the violence of the imperative and the situation to collapse the line between spectator and consumer.

8. Games We Play

The combination of instructions and chance immediately brings to mind games. Games are played following certain rules, but are often open to chance operations. Think, for example, of a game involving dice, like backgammon. The players follow strict rules to move counters on the board according to the numbers shown by the dice. But, as it is clear when watching highly proficient players, their moves are dictated by the probability of the numbers produced by the dice, that is to say the statistical distribution of the outcomes. Such forms of chance seem different from what the artists above sought to introduce. In fact, this kind of chance was, in mid to late seventeenth century, organized into a worldview that rejected determinism and accepted chance in terms of calculable probabilities (Hacking 2006 [1975]). Gambling games involving dice provided a pathway into such a new worldview.

Think, however, of a different kind of game like tabletop role-playing games such as Dungeons and Dragons that bring to relief a different kind of chance, one that is closer to what Chiba denotes as contingency. D&D is a game where participants play as a single character to go on an adventure together, which they formulate

collectively as each player narrates certain actions that are in concert with the setting of the world and the particular situation. To navigate and frame their actions, players employ character sheets and dice. The numbers of the dice could mean different things from character attributes or the strength of an attack, depending on the situation. With the aid of the character sheets and the dice, the players (most often with the help of a Dungeon Master in charge of moderating the game by creating events and establishing narrative continuities) collaboratively develop a narrative. The game is therefore open to elements of chance that go beyond what can be straightforwardly captured and numerified in terms of statistical distribution. The narrative that has already been developed, the relationship between the players, the day each of them had before arriving, the time spent playing, the amount of alcohol consumed, the level of excitement and tiredness, the intrusion of a neighbor who is unhappy with the noise, a text message beckoning a player to come home because a baby does not stop crying, an earthquake during the game, can all create undulations in the narrative unfolding that are unpredictable or sometimes even improbable. This kind of “fragmental encounter and separation of worldly events” based on the “meaninglessness of the finitude of worldly entities” (Galloway and Chiba 2016), can open a game structured by instructions to contingency.

Such forms of contingency can naturally be discerned in gambling games of dice too. The probabilistic could be construed to encompass some of the things I characterized as contingency above; if one player had a tough day at work, they are more prone to do

this or that, for example. But the contingent aspect in Chiba's sense is more readily discernible in games involving linguistic exchange. This becomes apparent when the element of chance, say with dice, is removed. The game of charades, for example. The rules of charades varies greatly due to its long history and wide adoption, but it is today essentially a word guessing game where a player picks a phrase that they have to convey to other players using only physical motions, without uttering a sound. The game is therefore highly specific to the knowledge and histories shared in the room. Meanings are conveyed using tenuous metaphorical, analogical, metonymic links through the cooperative participation of the players, who improvise from moment to moment according to the reaction of others. This makes the game highly contingent to particular situations that are replete with meaningful connections and meaningless ruptures.

Cognitive scientists Morten Christiansen and Nick Chater (2022) have made the convincing case that charades is a useful metaphor to understand how language itself works. Language is, like in a game of charades, "invented" every time it is exercised. This may be counterintuitive given the fluidity with which we communicate through language, but this is only because certain patterns become more established through repeated use within groups of people. But conventionalization is never fully accomplished. Language is inherently flexible, and is always shaped by the particular moment, and all we can do is suggest clues of what we wish to convey in the hope that they will be interpreted in the way we meant it. Although, "what we mean" is perhaps something

that is inaccessible to the speaker too, with meanings being produced in the interaction that occurs.

We are now firmly in the territory of Ludwig Wittgenstein (1958), a philosopher who Christiansen and Chater also invoke. In contrast to his earlier work, where he sought to logically establish a direct correspondence between word and world, his later work focused on linguistic *practice*. Language is like a game, Wittgenstein postulated. His explanation of what he means by game is evocative of his view on language and is worth quoting at length:

66. Consider for example the proceedings that we call "games". I mean board-games, card-games, ball-games, Olympic games, and so on. What is common to them all?—Don't say: "There must be something common, or they would not be called 'games' "—but look and see whether there is anything common to all.—For if you look at them you will not see something that is common to all, but similarities, relationships, and a whole series of them at that. To repeat: don't think, but look!—Look for example at board-games, with their multifarious relationships. Now pass to card-games; here you find many correspondences with the first group, but many common features drop out, and others appear. When we pass next to ball games, much that is common is retained, but much is lost. . . . And we can go through the many, many other groups of games in the same way; can see how similarities crop up and disappear.

And the result of this examination is: we see a complicated network of similarities overlapping and criss-crossing: sometimes overall similarities, sometimes similarities of detail.

Thus the meaning of the word “game” is ample and flexible, and can only find temporary stability in the particular situation owing to the similarities that are found. In other words, “the meaning of a word is its use in the language” (Wittgenstein 1958, 20). There is no such “thing” in the world that directly corresponds to a word. Its meaning is dependent upon how it is used in practice. An example that Wittgenstein explores repeatedly is the word “pain”. Pain is a subjective experience, hence not verifiable, but the utterance “I’m in pain” allows the pain to enter the game of reporting inner experiences, thus to make sense. To say “I’m in pain” is a behavior to report an internal private state, a behavior that can be adopted by others. To enter a language game is thus to acknowledge the right of others to report their own pain. Humans enter a myriad of such community-wide games, building on games that have gone on for centuries, which inform the particular game being played in the specific situation. And each time we participate, we contribute to the constant reshaping of language, to the production and reproduction of meaning.

Again, tackling head-on the question of meaning goes beyond the scope of this study, particularly in the final chapters. What I wish to emphasize here is the moment-to-moment, inherently contingent improvisation that continuously reshapes language, and the

collective negotiation that this entails. I have argued that LLMs make this aspect of negotiation problematic. The “we” in the title of this chapter is intentionally ambiguous. Machines have undeniably entered the conversation. They have entered it, moreover, in a way that is difficult to demarcate where they end and humans begin. As they become increasingly integrated to the infrastructures of our language use, the question of whether something was written by a human or a machine becomes increasingly obsolete. Writing will become, perhaps has already become, a collaborative man-machine act. This is why it is crucial to forge spaces where the negotiation of meanings can happen, to retain the possibility for the charade-like ridiculous malleability of language, to maintain the chance to digress from the values encoded in the machines.

9. The Experiment

The instructions in instruction-based art resemble prompts in LLMs. They both cue the viewer or the machine to act and react in certain ways. However, the ways in which viewer and machine can respond to the instructions are different. Whereas the machine can only fail in terms of providing wrong information or by reiterating the fact that “as a large language model” it cannot do certain things, the viewer can rebel in other ways, by not doing what they are asked, or by doing something entirely different. The artwork emerging from this research aims to accentuate this aspect to open up a space where people can renegotiate meanings congealed by LLMs. It is an experiment to put things into motion in ways not foreseen by the design of the machines.

The premise of the work is simple. Outputs by a LLM are printed out and shredded into fragments. Visitors are instructed in writing to pick one fragment, or perhaps several, and to make use of the words found in these fragments to write down a wish for someone they care about. They are then asked to put the fragments they used and the written wish into an envelope and to leave it on the desk. Finally, they are told to pick the envelope left by the

previous person, and to give that envelope to the person they thought of.

There are several aspects that need to be unpacked here. First, the work follows some of the operations made by LLMs, but in a different way. LLMs undergo a process known as tokenization, meaning breaking down language into segments, such as words but not always, that make them amenable for calculation. The segments are then embedded into a space where their relation is mapped, as explained in Chapter 2. This artwork also segments language, but using the entirely different rationale of a shredding machine, which cuts the output of LLMs into pieces according to the geometries of its cutting mechanisms engineered to obfuscate the meaning in the documents it processes. Thus language undergoes a process of being broken down by a logic external to it that removes coherence. This operation introduces the element of chance, which is further exacerbated by the visitor picking up a shredded fragment at random.

Second, this chance encounter with a word or a fragment of it is a crucial factor. The visitor is not asked to write down something out of nowhere—they are asked to make use of the word to produce something in response. In his book *The World of the Middle Voice: Archaeology of Will and Responsibility*, Japanese philosopher Koichiro Kokubun (2017) has analyzed the middle voice in ancient Greek. Here, “voice” refers to the grammatical construct that defines the relationship between an action expressed by a verb and the participants involved. In most contemporary languages, the active voice (“I see an apple”) and the passive voice (“An apple is

seen by me”) are common and easy to grasp, but we it is difficult to even imagine the middle voice when thinking in English. An example of the middle voice is the ancient Greek verb *chresthai*, meaning “to make use of”. The meaning of the verb changes significantly according to what word that is used next to it. *Chresthai logoi*, “to make use of language” means to speak, *chresthai symphorai*, “to make use of misfortune” means to be unhappy, *chresthai nostou*, “to make use of return” means to feel nostalgia. The verb thus cannot simply be conceived in terms of a subject doing something to an object, or an object doing something to the subject, but rather “expresses the relation that one has with oneself, the affection that one receives insofar as one is in relation with a determinate being” to use Giorgio Agamben’s (Agamben 2016, 28) formulation. For Kokubun, the middle voice is important because it redefines the boundaries and shapes of subjectivity in a way that accommodates a state defined by relationships rather than by a distinction between subject and object. This is relevant for the work in terms of enabling digression. By making use of the fragments of words, visitors are asked to enter a negotiation that does not take their interiority and intentions as the starting point. They use the word while at the same time being used by the word. The instruction to *make use of* the word thus prevents a strong subject from arising as the subject inherently emerges in relation to the word picked by chance. It is this relationality that allows both the visitor and the output of LLMs to digress from the intended courses.

Third, the writing of a wish relates to the emergence of writing and to Japanese cultural practice. The earliest evidence of Chinese

script, which continues to be in use today in altered form, making it the oldest surviving script, and which was imported and applied to the Japanese language that had no writing system, dates back to around 1,200 BCE in the form of engravings into animal bones known as oracle bone script. It is believed that these bones were used in divination practices, where the engraved bones were cast into fire to see how cracks developed so to “read” signs for future omens. Given how well developed those scripts are, it is likely that the bone script was preceded by forms of writing done on materials that were less durable and which did not survive to this day, but what is of note here is that writing was inseparable from materialities. The visual parallels between the script and the cracks in the bones is only too apparent. This aspect of materialization of language is something that LLMs obfuscate despite being entirely dependent on its material supports enabled by extractivist logics, which are increasingly removed from our imagination with metaphors such as the cloud as explored in Chapter 3. Divination is also interesting in that it is precisely what LLMs are organized to achieve. That is to say, they are machines that are designed to “predict” the next word in a sequence, produced in an economic and industrial environment that privileges prediction in the first place. It is no coincidence that predictive texting is seamlessly incorporated in devices today, or that when searching something on Google, the service attempts to complete the sentence, thus making the language we produce more agreeable to the way data is organized.

Related to divination, wishing rituals that involve writing are prevalent in many cultures, including Japan, where it is common practice to go to shrines to write a wish and hang it onto something, including a wind chime. Yoko Ono's *Wish Tree* mentioned in Chapter 7, from which this experiment is undeniably influenced, is also reminiscent of the Tanabata Festival where people write a wish on a piece of paper and hang it on a bamboo tree. Wishing by writing brings a dimension of language that LLMs are not adept at—the reconfiguration of relations. A common form of wishing in Japanese shrines, for example, relates to finding marriage partners, which is articulated as “finding a good *en*”. *En* 縁, is a concept of Buddhist origins, meaning the relationships between people, things, and events guided by invisible forces arising from necessity and contingency. Thus, by writing down a wish, people seek to affect a rearrangement of relationships in the real world.

Fourth, this rearrangement of relationships between people, things, and events, is framed within this artwork in direct reference to a specific someone the visitor cares about. This specificity has two functions. It is, first of all, an antidote to the generalized platitudes, to the stereotypical clichés reproduced by LLMs. To construct a wish for someone is to become attuned to the peculiarities of the situation this someone finds themselves in, and of the relationship between the visitor and this someone. The random word that the visitor picks is made to acrobatically find coherence with this situation, thus breaking the static mapping of language employed by LLMs. Secondly, the specificity is positioned outside of the visitor. The visitor is forced to open up to a situation that they are

involved in, but one which cannot be concluded within themselves. They are therefore precluded from entering a closed loop of self-talk, of language directed at oneself only, something that LLMs are increasingly becoming susceptible to. It is much more difficult to write something pessimistic when we write not for ourselves, but for someone else.

Fifth, this opening up is further augmented by the envelope, which makes the wish mobile. The visitor is asked to seal the wish they wrote in an envelope, but to take the envelope the previous person left and to give that envelope to the person they thought of. The visitor is therefore not in control of the message that is delivered. This aspect relates to the nature of language as explored by Jacques Derrida (1987). Derrida posited that a message constructed using language does not always arrive at its destination, like a letter being delivered by post, and that even when it did, the message may be entirely misinterpreted. Characterizing this as “misdelivery”, Hiroki Azuma (2023) posits that it is precisely such kind of misdeliveries that allow for a generative rewiring of relations to occur. The visitor is therefore exposed to yet another chance operation. The handing of the message will likely require some explanation of the nature of the message and how it was produced and arrived at the destination. By allowing for the introduction of this extraneous element, the situation involving the visitor and the recipient of the envelope undergo a transformation, however slight, which requires a reordering. It is precisely this reordering instigated by chance that this artwork seeks to bring about. What, for example, would happen if the message that is delivered happens to

be a curse? The participants enter a game where they are prompted to construct possible meanings together.

Sixth, and finally, unlike in Ono's *Wish Tree*, where messages written by visitors first become part of the display, then collected and accumulated by the artist, this work does not seek to store the messages that are written or to make them part of the exhibition. This is yet another antidote to the developmental and operational principles of LLMs that rely on accumulating ever more data. Visitors can choose whether and how to participate in the experiment, and are not asked to provide something in return that bolsters the system itself, like in a "freemium" model where a service is free to use in exchange of providing usage data. The dramaturgy of the work unfolds in a way that is inaccessible to all others, including myself, other than the people connected by an envelope intended for someone else, strictly in the porous privacy of their random coupling.

The staging of the work will involve a desk and a chair where a pile of shredded LLM outputs sits, and where visitors write their wish and leave their envelopes. To make visitors aware of the provenance of the shredded fragments, the desk will be positioned in a room-in-a-room surrounded by shōji screens, where the usual rice paper is replaced by LLM outputs printed on translucent sheets that create an obfuscated view into and out of the room. This room is further surrounded by rows of wind chimes. Wind chimes are commonly used in shrines across Japan to attach hand written wishes to. They are thus part of a common cultural practice, one that is familiar to me, but they also serve to create an atmosphere

that departs from the every day, bringing a ritualistic aspect to the work that awakens dimensions of language that cannot be reduced to communicative productivity—dimensions such as the metaphorical, the mysterious, the ineffable—something that LLMs are not oriented toward. The visitors, however, will not be simply allowed to reverie away from the realities of LLMs into a vaguely Asian ritualistic space. Taking flight requires friction. Attached to the many wind chimes will be cutups of images and texts that have emerged from the research, which point to the problematic dynamics and histories in which LLMs are involved. These elements, these congealing agents, are, however, presented as fragments without full explanations and descriptions. This prevents an overload of meaning that the visitors have to digest and decipher. They are suggestions of connections, and are put into motion by the visitors that act as wind to produce sounds, activating senses and noisy associations.

Despite the simple premise of writing a wish based on a fragment of a word, this experiment is therefore shaped by many interrelated perspectives and references. It is characterized as an experiment because the success of the digression is open to the chance encounters with the visitors. The work is an invitation for visitors to enjoy and find meaning in digressing, in becoming engaged in the potentials and difficulties of language that are flattened by LLMs. It is therefore itself a wish that a reconfiguration of relationships through an unusual engagement with language may occur.

Conclusion

When we digress in a conversation, we may come back to the main course announcing “But I digress. . . .” When we do come back, however, the conversation has been reshaped in light of the digression. It is now populated by things that are associated with the main course but do not quite fit and continue to create openings for other connections to happen. Digressions occur not because of a rigidly shaped will of the interlocutors, but because there is something that flows over the linear progression of an event, triggered by chance encounters of the elements that happen to be present. Given the broad and deep problems with LLMs that this research has identified, some readers may feel that digression is not an adequate solution. I agree. What is being proposed here is not a solution. A solution has to take the shape of policies and regulations, of collective resistance and action, but such endeavors often take certain assumptions for granted, one of which is the ideal of the strong discursive subject that has been the very foundation of the many problems that have been explored. Digression prevents this strong subject to emerge. It introduces new perspectives that the participants had not intended or had not allowed to be present,

making them aware of the conditions of an event anew while also reconfiguring them inadvertently.

This text began with a historical exercise to follow how the Markov Chain became different things at different times, bringing to light the fact that no technology, not even a mathematical model, takes shape in a vacuum. It is therefore of paramount importance to understand the historical contingencies that brings elements together in particular ways when trying to understand the promises and problems of a particular technology. This viewpoint guided us in analyzing the way LLMs work, and in identifying what kind of issues cause it to be stuck in a closed loop, which we likened to a “Bad Place” borrowing Noi Sawaragi’s characterization of Japanese postwar art. LLMs suffer from deep inertias that lodge them at the extension of problematic histories tinged with exploitation and extraction. They operate within cultural and economic environments that privilege certain attentions and attitudes, which celebrate profit maximization and techno-utopian ideas that revive eugenic beliefs. As engines of ahistoricity, they make it increasingly difficult to engage with such problems imbued with history. They are beginning to spew out a generalized mush at scale, inevitably affecting how we relate to and communicate with one another.

Given this analysis, it is tempting to produce an artwork that seeks to convey this dark picture. Such dark pictures are necessary to understand the conditions we are in, but too often they simply lead to despondency, to a feeling of being immobilized by the immensity and complexity of the problems. The artwork that has emerged, that is currently emerging, seeks a different path. It aims

to be generative, to offer an opportunity for playful and hopeful engagement with language, not despite of, but because of the situation that has been analyzed.

I remember that, as a child, I used to play a prank on my brothers. Our toilet had the light switch outside of the door, on the right side. We would turn the switch on and off without looking when entering or leaving the room. My trick was to hide myself around the corner when one of them entered the toilet and cover the switch with my hand. As they came out, they would extend their hand to switch off the light, only to feel my hand and not the switch. Much hilarity would ensue as they were startled by the sensation of touching something that was not supposed to be there. Perhaps this artwork is trying to do something similar. To reposition elements that have become familiar to us in different ways so that they feel strange. So that clichés and platitudes feel out of step. So that we may start to question.

But I digress.

Epilogue

I wrote this text in haste, without much planning or revisions. I simply did not have the time for that given my new reality as a working parent. This is not how I usually write, and perhaps because of this, I was repeatedly surprised by what I was writing.

I did not know, for example, that race or the question of Asia would appear so insistently throughout the text. I did not know, until I stumbled upon the ChatGPT letter by the Peabody Office of Equity, Diversity and Inclusion for the victims of a mass shooting when I was looking for an example of what I found problematic, that this intersection of the generalized goo that LLMs produce and notions like “diversity” was something that deeply bothered me.

These are topics I usually shy away from. My father is a painter, and has often relied on overtly Japanese elements in his works. Being born and raised in Italy, my relationship to the country of my parents has always been troublesome, and I often felt a resistance to my father’s use of Japanese culture, seeing it as a cynical and maybe necessary marketing technique.

And here I am, making an artwork with shōji screens and wind chimes, which the website where I will probably buy them from lists

as “Asian wind chimes”. I vaguely know why these ideas came to me—I wrote about that in this text. But I really don’t know why they now seem acceptable to me. It may have something to do with becoming a parent, as I think about what it is that I am consciously and unconsciously passing on, including the question of which language. It may have something to do with coloniality and efforts to provincialize Western thought coming to the fore of academic and cultural attention. It may have something to do with writing this text in English, a language I adopted as my home, probably because it felt equidistant from Japanese and Italian, despite its problematic histories and presents. I even suspected that I have the urge to retreat to things that are familiar to me, as I try to create a work that instigates rearrangements to occur.

I’m not going to attempt a defensive explanation here. The truth is I don’t really know yet. These elements insisted to be there even when I tried to get rid of them. I accepted them because they are part of my world. Something in the arrangement of myself in relation to the world has changed. That’s all I know for now. I wonder how my child, who is twice removed from Japan, will feel about this work.

After joining the International School of Milan at the age of fifteen, I was put in the English as a Second Language class as I spoke next to no English. I still remember mispronouncing Lincoln, the U.S. president, in its Japanized version as L/R-in-kaan (I didn’t know whether it was supposed to be an L or an R given the lack of distinction in the Japanese language), making the teacher terribly perplexed. Soon, I was asked to join the normal English class as I

was progressing quicker than the other students, likely because I already knew a romance language, Italian, which the others didn't.

The first class I took with David Towe, the English teacher, is etched into my memory. They were working on reading a poem by Sylvia Plath. I don't remember if I did this because we were asked to do it, or if I did it spontaneously, but I wrote the meaning of each and every word in Japanese or Italian above the English word as most of them were unfamiliar to me. Even when they were familiar, their combination didn't make sense. The A4 copy of the poem turned red with my markings. It was only through the class, where Mr. Towe passionately helped us to decipher the lines, that semblances of meanings began to emerge. I was enthralled by the process.

I hesitate to end this text with a pedagogical anecdote, because the focus on literacy, on hermeneutics, on the English language and canon, particularly in the setting of formal schooling, not to say in a privileged institution like a private international school, all present problems that are also rooted in history. But it is also undeniable that this experience recomposed my world in ways that I can only be grateful for. It made the relationship between language and the world suspicious and malleable. I felt I could compose a place for myself to be, something that growing up as a child of immigrants, I always struggled to find.

I raise this example, which also has come to me by surprise after years of not thinking about it, perhaps because no event, no situation, no technology is simply bad or good. We constantly operate in gray areas hoping for light. The same goes for the research object that has accompanied me throughout this project.

The problems of LLMs are deep and sticky and harmful. Yet, there may be things that they put into motion as their place in the world is negotiated and they are continuously shaped and reshaped. There are many reasons to be pessimistic, some of which I listed in the text. This should not stop us from finding ways to make use of them in unexpected ways.

—Vienna, November 13, 2023

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