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How Human? 001

The actual course of... historical change as a whole is intended and planned by no-one... Civilization... is set in motion blindly, and kept in motion by the autonomous dynamics of a web of relationships.

—Norbert Elias, Social Constraint towards Self-Constraint (1943)

As organisms, we regenerate ourselves. We are armed with the cellular capacity to heal our wounds, our bone fractures, our injured tissues and organs. We fight viruses at the onset of their invasion in our body. We are biological in that machines crumble and cease to execute properly at the misplacing of a mere comma in their code, requiring everything in its rightful place in order to function properly, while the loss of a finger wouldn't nearly hinder our survival to the same drastic extent. When we are injured, we do not require our program of existence to be rerun or *reborn*. We require regeneration– a prosthetic finger in this case– but how do we define our humanity when the bounds of it are constantly pushed through the coconstruction of new technologies? In Marshall McLuhan's words of 1964, "All technologies are extensions of our physical and nervous systems to increase power and speed…" and, "any extension, whether of skin, hand, or foot, affects the whole psychic and social complex." (*Understanding Media*, 90) Is it truly sufficient, meaningful, or intelligent to define the human solely through biological classifications when so many of us utilize regenerative technologies to bring us back to the "baseline" of the standard human condition, i.e. our original *biological program*? Through Haraway's take, we are able to use this concept of regeneration and extend it to humans through the reconstitution and transformation of the self as the ongoing process of our interactions with

machinery and technology continues to shift; Our co-constructive relationship is defined almost entirely by its lack of stagnance. “For salamanders, regeneration after injury, such as the loss of a limb, involves regrowth of structure and restoration of function with the constant possibility of twinning or other odd topographical productions at the site of former injury. The regrown limb can be monstrous, duplicated, potent. We have all been injured, profoundly. We require regeneration, not rebirth, and the possibilities for our reconstitution include the utopian dream of the hope for a monstrous world without gender.” (*A Cyborg Manifesto,* 67) In this Cyborgian framework, human identity is in the constant flux of evolution, creation, and connection, allowing us to cultivate regenerative and transformative political and social relationships by breaking the binaries and dualistic definitions of the human. The Cyborg constantly redefines itself through its close entanglement with technology as an innate and integral aspect of its lived and embodied experience. It allows us to reconfigure the way we view the human, challenging socially archaic dualisms of Human/Animal, Human/Machine, Female/Male, and Nature/Culture. The latter allows us to scrutinize the ways in which Culture imposes itself on and subjugates what we deem as Nature while also objecting to the anthropomorphic dualism of Self/Other, the essentialist human spirit. “It is not just that science and technology are possible means of great human satisfaction, as well as a matrix of complex dominations. Cyborg imagery can suggest a way out of the maze of dualisms in which we have explained our bodies and our tools to ourselves.” (67) The multiplicity and inherently subversive nature of the Cyborg has ultimately allowed me to reframe the ways in which I define myself as I take notice of the vast technological influences at play in my experience nearly every second of the day. It has endowed me with a perspective of Human/Machine that strays away from the knee-jerk reaction of such a comparison being reductionist, immoral, or dehumanizing, and rather sees the importance,

reality, and opportunity in such an identity, definitively changing my definition of what it means to be human in our techno-universe. Therefore, a further analysis of my own humanity must be prefaced with the fluidity of the Cyborgian identity, inviting a scrutinization of the self that is neither merely *here* nor *there*. “Though both are bound in the spiral dance, I would rather be a cyborg than a goddess.” (Haraway, 68)

Large Language Models, or LLMs, progress at such an unfathomably exponential rate that their history need not be overlooked. Alan Turing’s 1950 work on computability and the Universal Machine revolutionized the fields of computer science by making the key claim that any discrete state machine could be mimicked by digital computers, their defining characteristic that made them known as *universal* machines. “The existence of machines with this property has the important consequence that, considerations of speed apart, it is unnecessary to design various new machines to do various computing processes. They can all be done with one digital computer, suitably programmed for each case.” (*Computing Machinery and Intelligence*, 448) And in the more advanced stages of Artificial Intelligence, prior to 2017, Machine Learning in its infancy (“infancy” being comparable to 2023) used to be fragmented by discipline, from computer vision to speech synthesis to image recognition. These were disciplines so distinct from one another that you could not read papers from one subject and understand those from another. And in 2017 (Google’s *Transformer: A Novel Neural Network Architecture for Language Understanding)*, that changed drastically– all of the varying fields, whether it be robotics, music generation, or speech recognition, merged into one– hence the *Large* in LLMs. It’s incredibly important to note that prior to this development, AI researchers would be making 2-3% incremental advances in their respective field, while now, everyone is contributing to one curve through the synthesization of data. What changed? What was realized? Absolutely

everything aforementioned is now known as *language* and processed as such. What makes LLMs so innately powerful and multiplicative is that now, any advance in one part of AI is an advance in every part of AI. Coined by the Center for Humane Technology, these models are known as Generative Large Language Multi-Modal Model (GLLMM).[1] As such, it's challenging to publish findings on AI because their improvements are never-ending, often surpassing themselves as soon as said findings have taken the time to have been edited, peer-reviewed, etc. However, I'd like to bring one use case of the relatively new and extensive LLM known as GPT-4 to light, in which the user can feed their very own vision to GPT-4 as *language*, allowing it to see what you see while also enabling you to ask questions out loud regarding what is seen. Aaron Ng, developer of the prototype, puts it as follows– "This demo uses GPT-4, eye tracking hardware, and feeds what I'm looking at into Azure's computer vision services to generate the appropriate metadata. People have mostly been talking to ChatGPT like a separate person or assistant, but this prototype acts more like an extension of you…*To me, AI's potential is not just in how it can act convincingly like a human, but how it could eventually act as an extension of ourselves.*" GLLMMs continue to blur the line between *where our tools end* and *where we begin.*

The synthesization of data to language has marked Human-Computer history to such an extent that these questions of our humanity and what defines our inanimate tools versus our fluid selves must be raised. Lucy Suchman argues that human agency, or our capacity for action, changes and reconfigures at the development of new tools. What happens to our capabilities when you combine a human (with emotions and motivations) and a machine (with certain functionality)? Suchman's work of *Plans and Situated Actions* allow us to scrutinize our human behavior through context, the ultimate feedback loop that delineates and bounds our behavior,

[1] And in the legendary Jewish folklore, *Golems* are known as inanimate objects that suddenly gain their own capacities.

while our situations respond to said behavior. “The planned character of our actions is not, in this sense, inherent but is demonstrably achieved. It is a reflexive feature of our (inter-)actions insofar as we are able, on an ongoing basis, to indicate (to others and/ or to ourselves) what we are aiming to do and to account for our actions as close enough for all practical purposes to what we had intended.” (13) In all of the discussion of computer language, where does human language, in all of its nuances, come into play? Utilizing *language* achieves the objectivity of the situations of our action, as plans represent *situated actions.* “[Language] stands in a generally indexical relationship to the circumstances it presupposes, produces, and describes. As a consequence of the indexicality of language, mutual intelligibility is achieved on each occasion of interaction with reference to situation particulars rather than being discharged once and for all by a stable body of shared meanings.” What does this mean for cultural context and knowledge? For Alison Adams, it involves a consideration of how the individual doing the thinking is grounded in the world, meaning “not only considering how their bodily skills interact in the world–how non-propositional knowledge is grounded–but also involves considering how the individual is situated within a culture and acquires and uses cultural ways of knowing” (*Artificial Knowing,* 1998). Forsythe (1993) suggests that as well as deleting the social, AI scientists delete the cultural. Languages, both technological and natural, are at the forefront of my experience every day. As the progeny of linguistic-loving parents who fled the economic crisis of Argentina in the late 1990’s to America through their studies of English as a foreign language, language is arguably the reason I am existing in the first place. As I learn my third natural language, Japanese, the inevitability of thinking *from* culture, similar to the way I do in Spanish and English, continues to persist. There are nuances to human language and the act of speaking said languages that can only be understood while situated within a cultural context. Does this make

me more or less like a machine, especially considering the term *code-switching* is, to me, an incredible way to articulate the subtle shifts in character and expression based on cultural or social contexts? Perhaps I am machine-like through my innately computational ability to code-switch given certain situated contexts. But can machines themselves even do this without being told to by a human? This is where we differ– in the innate, unspoken programming of human social interactions. GPT-3 itself states, "Machines like LLMs *cannot naturally* code-switch in social contexts as it requires specific programming and training to understand and generate content in multiple languages. This involves training the machine on diverse language data and developing algorithms for recognizing and responding to different language inputs." That being said, could this not all be translated into machine language given diverse and culturally representative data sets? Perhaps it could, but I think it's worthwhile to note the clear imposition of humanity onto machines. These are human-specific social behaviors, unnatural to the unprogrammed machine, the products of human evolution…to a certain extent. That being said, am I suddenly non-human when I fail to respond to others in a socially programmable way despite my human brain and beating heart? How would one go about 'debugging' that?

Before that claim is made, let us be clear that to universalize human behavior in such a totalizing way would be flawed and illogical. We do not all have this same, 'inherent' social programming– take those on the autism spectrum, or those who lack the ability to 'read' faces or tone, which is almost always expected of humans. In social robotics, unlike disembodied LLMs like GPT-4 and like Kismet, a social robot who is programmed to display and interpret human emotion, these bots are created solely to exist emotionally in a world shared with human beings, 'innate' social cues and all. Kerstin Dautenhahn, who works on robots designed to interact with children with autism in the AURORA project, treats mobile, autonomous robots as "potentially

therapeutic" precisely because they are not human. Through this, she posits that "using humans as models for creating believable technology … is not a universal solution for designing robotic social actors." (*The Surrogate Human Effect,* 113) The anthropomorphic form, in this case, restricts expectations about robot behavior and cognitive complexities. Brazeal, Brooks, and other roboticists working on these embodied robots have made it clear that "the 'magic' of robots is that they are *not* humans, and the engineers' goal is not to replicate what humans already do well." (*The Surrogate Human Effect,* 113) The works of these roboticists highlight an important aspect of human-machine sociality, including the hindrances that anthropomorphic restrictions imposed on social robots may produce, as well as the faults in universalizing human behavior in juxtaposition with the social machine– a helpful addition to my own introspection.

This thoughtful exploration of what aspects of humanity can be mechanized (or cannot), in fact, dates back to centuries ago. Although archaic in its origins, the same question in our advancing[2] technological world remains. Jessica Riskin emphasized the work of Vaucanson's automata of the eighteenth-century, such as the Defecating Duck. This automata was a mechanical duck that swallowed corn and grain and relieved itself of an "authentic-looking burden"; They were philosophical experiments, attempts at simulating the mechanical processes of animal digestion to discern "which aspects of living creatures could be reproduced in machinery, and to what degree, and what such reproductions might reveal about their natural subjects." (*The Defecating Duck*, 601) The Duck served to show both the process of mechanical simulation and its not-so-clear boundary of not *truly* being able to digest. Even after an incredibly intricate simulation, down to each wing containing over four hundred articulated

[2] Theory of Mind May Have Spontaneously Emerged in Large Language Models:

"We tested several language models using 40 classic false-belief tasks widely used to test ToM in humans. The models published before 2020 showed virtually no ability to solve ToM tasks…GPT-4 published in March 2023 solved nearly all the tasks (95%). These findings suggest that ToM-like ability **(thus far considered to be uniquely human)** may have spontaneously emerged as a byproduct of language models' improving language skills."

pieces, the Duck's "fraudulence" came into play through its lack of digestion *behind the scenes*, being accused of acting as "nothing more than a coffee grinder" by a 1755 critic. The ability to produce an automata that displays so clearly both the stark, mechanistic similarity *and* incomparability of biological life and machinery *at the same time* is truly compelling, and a point that will be circled back to.

Searle, on the other hand, in the framework of computer simulations (Strong AI) that pass the Turing test of convincing a human (much like the old defecating Duck), would argue that to simulate understanding is not to truly understand something or to have a consciousness that allows for such an understanding. No matter how convincing or complex the simulation is. Searle seems to assume that humans themselves have the innate ability to *truly* understand others–in other words, to see behind the theater curtain of simulacrum–but how do we begin to define where rule-following ends and true understanding begins? Could we not argue that the more information or rules given, the deeper one's understanding will be? Is this not the principle on which human learning operates? In Robert Abelson's words, "When a child learns to add, what does he do except apply rules? Where does 'understanding' enter?" (*The Behavioral and Brain Sciences*, 424) In the context of LLMs, how can we confidently say that *we* understand but *they* don't when our cues of human understanding are solely matters of output, when we have absolutely no way of going inside another's brain to check if they are *truly* understanding beyond undergoing an MRI?

On the other end of the argument, I wonder, have machines imposed themselves on us? Are humans, in their increasingly entangled and nuanced relations with machines, being reduced to mechanistic processes? In other words, through our complex interactions, have humans adapted their language and altered their "natural" ways of questioning to most efficiently

communicate with machines? Those of us immersed in cyberspace have long known that there are better and quicker ways to achieve the desired results from a machine, for example, getting a more concrete or to-the-point answer through utilizing keywords and adhering less to the grammatical rules of the English language. Whereas one may naturally think of the question, '*I wonder how to make a function in JavaScript where I can toggle a button back and forth from displaying new content in a new div element and hiding it on a second or subsequent click?*' To find the answer most quickly, one would likely much rather search for, '*JavaScript button toggle new div element change inner HTML'*. In Bauldrillard's words, "As for the robot, as its name implies, it works; end of the theatre, beginning of human mechanics…The machine is the equivalent of man, appropriating him to itself as an equal in the unity of a functional process." (*Symbolic Exchange and Death*, 4), and, "Men themselves only began to proliferate when, with the Industrial Revolution, they took on the status of machines: freed of all semblance, freed even from their double, they grew increasingly similar to the system of production of which they were nothing more than the miniaturised equivalent." (5) In this context, man is reduced to machine through both the specific rules of operation in the factory and the uniformity of production, much like the efficiency and programmation respectively found in robots. Outside of this context, it begs the question, how much are our daily interactions with machines altering the ways in which we communicate *like* machines, and in turn, does this make *us* more like *them*? From Bauldrillard's perspective, I'd say, yes, altering our natural language so drastically definitely does make us more machine-like. I'm a programmer, and as such I've spent hours attempting to master the naturalized version of computer language that ultimately becomes translated into true computer binary– millions of zeroes and ones. Although programming languages are now logically accessible and comprehensible to humans (as opposed to binary), it is still a quite

tedious and computational process that can be daunting to a programming novice. But, it's a skill my human brain has allowed me to learn. As Suchman states, "[Human c]ognition is not like computation, it literally is computational." (*Human-Machine Reconfigurations,* 36*)* However, I believe that my ability to toggle back and forth between physical reality and cyberspace (are there even concrete distinctions between the two anymore?) is Cyborgian in and of itself.

It is helpful to take into account Alfred Gell's perspective, as well, found in Suchman's *Human-Machine Reconfigurations*– "[He] goes on to consider how it is that people can simultaneously know that entities are categorically different from persons and at the same time attribute social agency to them. The key, he argues, is to locate the latter not in any necessary physical attributes (such as inanimate things versus incarnate person) but in social relations: 'it does not matter, in ascribing 'social agent status, what a thing (or person) 'is' in itself, what matters is where it stands in a network of social relations'. (22) In the context of the "smart" machine, the machines today that dominate all domains of human knowledge, producing vast asymmetries in what is known about *us* versus what is known about *them* (and where our data is sold to), it doesn't seem to make sense why we willingly pay for and play into such asymmetrical power-knowledge relations in the Foucauldian sense. These are the knowledge markets that dominate our capitalist system– efficient, convenient, *human-first* metrics championed with ambiguous ethical implications occuring at the same time, all in size 8 font of a thousand-page contractual privacy agreement. Privacy issues aside, it begs the question, is automated efficiency in our homes what we're after? Would it be so outlandish to move from the home into the human, and have we already crossed that line (see the earlier prototype example)? Does it help us or hinder us more in the scope of our humanity, especially given the context of novel

accessibility advancements? What bothers us more– the aid from the robot, or the human on the other end of it surveilling? These are questions I continue to ponder in a fluid manner.

The process of building and programming the *adafruit* CPX with motors, wheels, and ultrasonic sensors was, and continues to be, a noteworthy and meaningful experience to reflect on. I was eager to dabble in hardware for the first time and feel the frustration of my buggy physical creation. Having already had experience in a few programming languages and various softwares, I knew that my failure, frustration, and anticipation to get this little robot to perform its simple task of getting through a maze were all inevitable. Debugging, no matter how small the mistake may be, proves to be the one constant in programming and development. This, I knew…this, I could expect. What I did not expect, however, was to feel humbled, and at the same time, incredibly eager, enthusiastic, and proud, all in a way that was not as visceral to me as in traditional programming. Instead of a red error message at the onset of the push of the Run Module button in Python, when I had an issue with my bot, nothing happened at all. It was the absence of the error message (console log aside), and rather, the lack of physical movement that signified I had made a mistake. It was an anticipation that I can only liken to waiting for someone (your first child, perhaps…) to take their first steps, contingent solely on your instructions. Except, you're nearly positive that your instructions are correct…But they are clearly not so, made blatantly evident by your child's lack of steps. When the motors of my bot started running and its wheels started spinning for the first time, the wave of relief startled me on its crash down. When my robot showed inklings of 'understanding' through its execution, it felt as though broken communication was finally patched up and crystal clear, no matter if it was indeed still slightly buggy. I felt that I had anthropomorphized this physical robot more than any

other pieces of code I had gone through the lengthy process of debugging before. When it functioned properly, it was as if it came to life.

At the same time, though, I distinctly knew that this was not nearly close to what I know as 'life', in all of its emotion, complexity, pain, joy, and love–this, I knew, so much so that I felt it went unsaid. What was most interesting to me was that creating a robot from scratch allowed me to take a step back and view our stark, programmatic differences, in a way that was not offered to me before– Flesh and Hardware as true collaborators. I found myself imbued with excitement and gratitude regarding my technological immersion and the possibilities available to me through cyberspace and regenerative technologies (and to others!), while also being ultimately endowed with a renewed appreciation for the evident asymmetries between us both. As always, perhaps now more than ever, new technologies necessitate an analysis of what new responsibilities they uncover and the ways in which they may, or inevitably will, alter humanity and the fabric by which it operates. [3] Today, echoed over two and a half centuries later, the questions begged by Vauconson's automata continue to ring true, "The result was a continual redrawing of the boundary between human and machine and redefinition of the essence of life and intelligence. Insofar as we are still, in discussions of modern technologies from robotics to cloning, redrawing the same boundary and reevaluating its implications for the nature of life,

[3] Excerpt of Rule One of the Three proposed rules of Humane Technology, in a podcast by Tristan Harris and Aza Raskin;

Aza: "So I think rule one in some sense to me is always the most surprising because you really have to learn how to look sideways to try to figure out what new responsibilities are uncovered when a new technology is invented…We didn't need the right to be forgotten until computers could remember us forever. It is surprising that cheap storage means we have to write new laws about being able to be forgotten. Or another one, we didn't need to have the right to privacy in our laws until cameras were mass-produced. In fact, the original constitution doesn't have a right to privacy. It took one of America's most brilliant legal minds, Brandeis, who later became a member of the Supreme Court, to argue for the need for the right to privacy. For Kodak, who is making mass-produced cameras for the first time, that was not a thought in their head. It's very surprising that you invent a new technology like a camera, and suddenly we need to invent brand new legal concepts. A more recent example are generative models. So we've invented a new technology. I can type in text and get out a brand new image that has never existed before, as described by that text. What new responsibility might that create? What's been uncovered? Well, one of the surprising things is that you can type in the name of any artist and say, make me a picture of an apple being held by an astronaut in the style of, and then name any artist you want, it can be a living artist, and it will produce that image in the style of that artist. Now the question is, who owns the copyright? It's not clear. Suddenly you can essentially steal the style of a living artist, make money off of their style, but nothing here is yet illegal. So a new technology is creating a new capability which uncovers a new class of responsibility that isn't yet protected."

work, and thought, we are continuing a project whose rudiments were established two and a half centuries ago by the defecating Duck that didn't."

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