FROM SPECIALISED TO HYPER-SPECIALISED LABOUR: FUTURE LABOUR MARKETS AS HELMED BY ADVANCED COMPUTER INTELLIGENCE

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Abstract: With the transition of the pandemic-gripped labour market *en masse* to remote capabilities to avert from national or international economic meltdowns, a concern arises that many job seekers simply *cannot* fit into the new roles being developed and implemented. Beyond the loss of on-site work, the market is unable to reverse the loss of many roles that are, and have been, taken over by artificial (computer) intelligence systems (CIS). The "business-as-usual" mentality that many have come to associate with pre-pandemic life supposedly took these losses into account, much to various societies' detriment during this international crisis. And unlike at the turn of the millennium, the market has come to realize that it *cannot* function without advanced CIS. Arguments *can* be made that humanity's currently most sophisticated CIS come nowhere near replicating the nuances that would prompt one to classify the system as being "human-like," and that they will remain this way for the foreseeable future. However, what is conveniently ignored in this assessment is how *not even* three generations have passed since computer systems became an integral aspect of daily life. While the loss of work for humans as a result of this advancement of technology may not *immediately* reach concerning levels, it still raises concerns for *how* society should react to a lack of non-specialised work and the value of "humanness" in the labour market whether nationally or internationally. This work intends to explore these concepts and provide anticipatory guidance on how humanity should adapt to post-pandemic life.

Keywords: Computer Intelligence, Human Augmentation, Labour Markets, Remote Work, Speculative Bioethics, Technoethics

Introduction

Surprisingly, many of the technologies that have been available for years through Google, Microsoft, and other corporations, have only recently been put to corporate-level use as a result of the SARS-CoV-2 (COVID-19) pandemic (Brenan 2020, Desilver 2020, Williams 2020).[1] Although this may be attributed to a lack of corporate "imagination" (Williams 2020), other factors undoubtedly incorporate real concerns—such as cybersecurity, stable access to an Internet connection, and access to corporate-mandated hardware, programs, software, and virtual private networks—into rationales for why these technologies have remained relatively unutilised in recent years. For all of the relative amount of "good" remote work has displayed for the labour market internationally, losses abound in the abrupt "telecommute" transition. These losses do not *just* include the various jobs that many have been furloughed for, but the loss of the home/work barrier (if such a thing ever existed before the pandemic) and meaningful social interactions with the "work family." Even if COVID-19 abides and humanity gains some form of herd immunity against the virus, these *supposedly* temporary transitions *will* become more permanent as organisations see greater worker efficiency outside of the general office settings we have grown accustomed to environing (Forbes 2020).

Underlying these transformations is the endless struggle to balance between repetitive functions that can be entrusted to a human and the ceaseless progression of artificial (or computer) intelligence systems to take these tasks either partially or entirely out of human hands. Of course, there exists a myriad of artificial intelligence programs and software, and each can be applied to a specific task or range of tasks. However, the most common of artificial intelligence systems (Polson and Scott 2018, 13-42; Coeckelbergh 2020, 3-5) are limited in the tasks that they can feasibly automate for humans. Whether for good or ill, however, this will *not* always be the case. Given the changes that *will* come with advanced computer intelligence systems (CIS), and their integration into developing technologies in industries ranging from manufacturing to medicine, a precautionary narrative is *vital* to aiding society towards a developmental path that does not needlessly displace vast portions of the labour force *en masse* upon the

[1] Specifically attributing to the use of instant messaging or video conferencing software and tools like Microsoft Teams. While these tools have seen use over the years, they have only been sparsely integrated in many corporate environments and were not *as* integral as they have come to be in this current global health crisis.

implementation of these systems. This chapter is less a discourse on business or professional ethics than it is a broad supposition of what lies ahead for various labour markets, as the future trends of technological advancement are frequently unpredictable or unknown—especially in regard to future career availability and evolution (Lent 2018, 207-208). In terms of cultural workplace norms, the author will make heavy reference to the USA given the unique challenges that nation will face in this coming shift in labour market specialisation.

Before discussing the intricacies of the outlook of the anticipated workforce, however, it would do to remind the reader that CIS are *not* limited to a single program, software system, or piece of hardware. Rather, CIS can exist in a variety of forms and fashions (Jaynes 2020a, 344), so a singular definition to encompass the entirety of computational intelligence is challenging to maintain. For the purposes of this chapter, our focus shall remain upon those CIS that *could* be said to possess intelligence *and* functionality equivalent to that of an average adult human—although other arguments may posit that any CIS attaining a "human-like" status *ought* to be judged from the understood levels of intelligence held by humanity's intellectually-challenged population as representatives of the "lowest" aspect of human intelligence that retains legal protections (Jaynes 2020b; 11, 18). This focus may sharply contrast the CIS some in the field of computer science may be familiar with, which could not feasibly pass itself off as being human under the "right" test conditions.[2]

More than human: The merger betwixt humans and robotics

As many readers are keenly aware, computers have become ever-so prevalent in our daily lives—a stark contrast to the work environment of the 1990s or early 2000s. And based upon general observations of the past two decades alone, computers are bound to encompass more facets of daily life than we could feasibly imagine today. Already, entities from corporations to countries are developing ways in which implantable radio frequency identification (RFID) chips can gain one more relative freedoms by allow the user to interact with their environment in "hands-free" manners (Saadi, Touhami and Yagoub 2017; Savage 2018). Other research has taken a different approach with electronic tattoos (e-tattoos), which serve as a sort of "next-generation" health wearable (Ha et al. 2019, Jeong and Lu 2019, Jeon et al. 2019). The author cannot help but wonder, however, *when* will the figurative "line in the sand" be crossed between greater convenience and means to more accurately monitor our health, and the establishment of a "new" categorisation for human subjects—both taxonomically and legally. When will humanity go "too far" in augmenting our biological forms with technology? This question lies at the heart of the philosophical debate surrounding the morality of human augmentation (HA) and human enhancement (HE), though it should be noted that the author views HE as being bodily modification through chemical means *rather* than bionic or computational means. While this personal note may not have a greater bearing on how academics define HE, it should provide the reader with a more grounded understanding of why "enhancement" may often be substituted for "augmentation" in this dialogue and the semantic rationale for this potentially field-opposing usage.

Those who fear an inequitable treatment of HA and HE technologies advocate for equal access to and fair pricing (or rather, equitability) for the technologies and substances that push our biological forms to their technologic limits (Farah 2010, Galván and Luppicini 2014, Palmerini 2015, Schmidt 2017, Ruggiu 2018). The limitations to artefacts such as e-tattoos and RFID chip implants lie in their availability specifically to those economically stable enough to afford the medical treatment involved with attaining these devices, as is seen in the USA healthcare system. Hence, nations such as Sweden are more capable of enabling their entire population to attain personalised RFID chips, given that their healthcare expenses are factored into their expected incomes and taxes as a result of their policy decisions in the modern era. The problem of equitability is *not* explicitly limited to newer technologies that require invasive procedures (i.e., implants), but ranges to neuro- or psycho-pharmaceutical substances (Farah, 2010, Chatterjee and Farah 2013), to bionic prosthetics (Brown 2013, Bertolini 2015, Sullivan 2018), and even somatic or germline gene editing technologies (Ormond et al. 2017, Enriquez 2019, Primc 2020).

The Issue of "Legal" Work

[2] These do *not* include the famous Turing Test, given that the premise for this proposed examination presupposes the concept that one of the entities being examined is not human—which may ultimately yield accuracy akin to a coin toss (Jaynes 2020a, 345).

Especially when we are discussing cases like the utilisation and proliferation of advanced bionic prosthetics, where reliance upon computational intelligence is integral to the device's functioning, other concerns come into play. Specifically, at what line is drawn between a *constitutional* person and a *legally unprotected* entity—as may be the case for some instances of advanced CIS (Jaynes 2020a, Jaynes 2020b). These concerns may seem to come at too early a time for some, but the issues will inherently *need* to be treated as CIS (in particular) gains in sophistication. There is a growing need for certain limitations to be drawn regarding the amount of work that can be processed by a sufficiently sophisticated CIS whose programming is akin to a "black box."[3] For reference, the definition of "work" being used is taken from John Danaher's paper, "Will Life Be Worth Living in a World Without Work? Technological Unemployment and the Meaning of Life;" being "The performance of some act or skill (cognitive, emotional, physical etc.) in return for economic reward, or in the ultimate hope of receiving some such reward" (2017, 43).

Take a scenario wherein a labourer at a construction yard is using a computer-intelligence-dependent assistive bionic prosthetic (CIDABP) to go about their duties. Let us further presume that this CIDABP does not transmit a "pain" signal through the central nervous system, and that strain to it is only feasibly measured in how quickly the patient must return to their preventive maintenance team for adjustments. Respective to how well they can perform their duties, they presumably will be able to lift more than their fellow labourers or be in "less" danger when in areas that could cause harm to the skin or limbs (in the case of a CIDABP that replaces either the entirety or part of one's arm). If the CIS driving the CIDABP does not have a "limiter" set for the amount of strain the prosthetic can endure,[4] can we *honestly* claim that the labourer's performance is solely due to their ability to perform their tasks efficiently if they are relying upon the CIDABP to take the majority of a given load? And who is then liable for any potential property damage should the CIS malfunction in some fashion? If the CIS is designed in such a manner that it can generate its own code to "adapt" to the environment it is exposed to, at what point can we no longer claim that it is the designer, programmer, manufacturer, maintenance person or team, or patient's responsibility to accept fault for the incident? Thus far, the USA and international law remain bare of sufficient legal jurisprudence regarding this matter—as no such CIS is currently in use in such environments.[5]

Let us take another case, wherein the question at hand is the legality of the work performed by a CI system:

> By suggesting that governments should grant legal protections to NBIs [non-biological intelligence], we are necessarily implying that these interested parties should be altruistic enough *not* to expect an economic return for their investments. How can this be fair? How should these investors be compensated?...If we conclude that NBI systems should compensate the corporation or organisation that developed it, it will need to earn a wage. This conclusion then implies that the system will be *required* to labour and that the nature of this labour will need to be *legal*. As the law is written, workers in the USA are required to prove their citizenship or proof of emigration to become employed legally. If the NBI system was developed in the USA, a case would need to be made that it is a US citizen. If this citizenship is denied on the grounds that an NBI system cannot be "born" like a human can, other methods will need to be devised to ensure that the labour done by the NBI is constitutional. Assuming that the system will only require time enough in the work week to debug its software and update itself, niceties like breaks and limits on work hours will inevitably exceed those required by human workers. What the legal system will also need to decide is whether allowing an NBI system to work more than a human (because it does not have the same biological needs) is legal under market competition considerations. Ultimately, this type of decision will determine the speed at which the job market will decrease on a local and national scale. Should the courts determine that the impact of NBI workers far offset what they are legally capable of ruling upon, other branches of government will be required to then make the determinations judiciaries cannot (Jaynes 2020a, 351, emphasis added).

[3] Generally defined as a device, system or object which can be viewed in terms of its inputs and outputs (or transfer characteristics), without any knowledge of its internal workings.

[4] For a set period of time with a given load—although the concept of developing such a system without a limiter may be infeasible if we consider that significantly heavy loads put an undue burden upon the relatively frail human form.

[5] *See generally* Tyler L. Jaynes and Linda MacDonald Glenn, "Direct Nervous System Monitoring and Interaction with Nanorobotics: A Proposed Framework for Novel Convergences," (forthcoming paper); Tyler L. Jaynes, "On Human Genome Manipulation and *Homo technicus*: The Legal Treatment of Non-Natural Human Subjects," (forthcoming paper); Tyler L. Jaynes, "The Legal Ambiguity of Advanced Assistive Bionic Prosthetics: Where to Define the Limits of 'Enhanced Persons' in Medical Treatment," (forthcoming paper).

Although this scenario is likely years away from becoming a reality, we must once again return to the question of the limits of *natural* human intelligence and how they diverge from the CIS equivalent (Lauret 2020). Or rather: if we were to take the computer system away from a given human—be it a desktop or laptop computer, tablet, or smartphone—how much can we expect that human to *know* or be capable of performing (e.g., academically, economically, socially) using non-computerized means? While this may seem like an unfair test to some given how much many of us rely on computerised calculators or "Doctor Google," it is the only *actual* test of the limitations of a natural human—albeit, for this scenario, we would wish to use a subject that grew up before computers were as sophisticated as they are today to know for certain.[6]

Loneliness and Technology

Another issue arises with the sophistication of computerised technologies—namely, in that it increases the relative amount of virtual interaction members of society have with one another. Even once humans begin to augment themselves with RFID-like chips that can synchronise thoughts, or develop wearable devices that project holographic workspaces, the issue remains that the amount of physical interaction we will be encouraged or required to engage in will become increasingly limited. The best example of this phenomenon would be to point to social media platforms, such as Facebook or Twitter. Although these platforms exist to help humanity keep in touch with our friends, family, and colleagues, they have become superficial reflections of our inner psyches—if one chooses to utilise these platforms at all.

Just think for a moment how *genuine* you personally are when you post or "tweet" on these sites. We rationalise that no sane individual puts their unfiltered thoughts online, and so we justify ourselves to put a "filter" on ourselves to match the audience we wish to reach out towards. Although this may be one form of communication, there is growing academic concern that excessive time on these platforms is contributing to a lessening of intimacy in interpersonal relationships and difficulty overcoming deficiencies in self-esteem (Hollenbaugh, Ferris, and Casey 2020; Lopez and Cuarteros 2020).

Given that "telecommuting" will become an increasing norm as companies realise the benefits gained from remote work (Forbes 2020),[7] there becomes a real concern that interpersonal communication between members of the same team will gain in superficiality. This trend may not *immediately* seem like a detriment, given how there are often "certain" people in the office one may rather not run into daily. Yet there are those "telecommuters" who have been turning to office noise generators during the current health crisis (King 2020) to fill the quiet space that inevitably permeates a remote work environment. Although these noise generators give the user some authority of the sounds they hear, they are still substituting for something particular—being, of course, the presence of other human beings that are not one's family. These "familiar strangers," as they may be considered, offer an outlet that one's more intimate contacts simply cannot fill—whether that be an outwardly friendly or hostile reaction that only these "familiar strangers" can provide, or some other nuanced interaction that would only occur in an office environment.

The future of market labour

With the emergence of sophisticated CIS will come a revolution to the type of labour required of the average individual. This trend is one that society has seen (arguably) since the dawn of the Industrial Revolution (Danaher 2017, 43-44), where seemingly unskilled labour evolves in such a way that it requires a trade or scholastic training to perform. Unlike how events transpired during the Industrial Revolution, today's rate of technological progression simply *cannot* compare. Although there is a wide range of estimations for when CIS will attain human-like intellectual status (Ford 2018, 528-529), it will likely come sooner than humanity would like if its development is approached in the "right"

[6] This is stated with the understanding that those members of society who advanced through school in or before the 1960s did not have complete access to the Internet of Things and thus were expected to memorise more "knowledge" than a student proceeding through school around the turn of the millennium. *See generally* "On Human Genome Manipulation and *Homo technicus*."

[7] Such as the potential cost-savings for providing employees the hardware they may need to perform their job remotely when compared to monthly office space rent, or support for local public transit participation.

manner.[8] As such, a brief look at the various forms computational intelligence *may* adopt will further clarify the gap that will exist between the requirements for "skilled" labour in the current economy and the economy to come.

Dividing Humanity (At Least) Four Ways

Evidently, humanity will reach the point where legal definitions expand to protect various groups that are enhanced or unenhanced as a matter of course—more for the moral considerations of preserving some aspects of where we "originated" from and what we can "become" than to serve as physical barriers (at the onset). Although complications of discrimination will inevitably arise as these categories are legally defined, the fact remains that there is *no* overarching measure of legal protections that can exist for a species that has bionically or chemically augmented themselves beyond the species' base abilities. Simply put, the same legal protections *cannot* be given to both a naturally unaugmented human that has no interaction with computers and a human who only has one aspect of themselves that remains organic.[9]

To begin with, the two categories of human require different things from legal and social systems—for one, protection of their right to remain (as some may state) a "Luddite" beyond those rights granted for religious expression,[10] and the other their right to be only one figurative step away from becoming an entity that only "exists" in Binary code. Another point adds that the interactions these members of humanity have will inevitably become increasingly complex as interpersonal relationships develop and flourish. After all, we do not know (at present) whether one loses the emotive capacity so integral to the human experience as one "swaps" organic material for bionic. As such, we can only assume the limits of human experience from the present moment and remain within the realms of living that we are currently familiar with (Jaynes 2020a, 345-346; Jaynes 2020b, 12).

Given these assumptions, one such method of separation may come from a four-stage model: biologically-natural, genetically-manipulated, computer-aided, and cybernetically-enhanced.[11] Distinguishing between individuals who have had their cells treated with genetic manipulation techniques and those who do not is essential insofar as we cannot accurately predict how manipulations to somatic or germline cells affect the individual or their progeny while also guaranteeing humans the right to an unaltered genome (Ormond et al. 2017). As alluded to before, this right to an unaltered genome *should* remain regardless of the technological changes before us for more than just religious practices, given that it is ultimately the culmination of our biologic heritage.[12] Although advocacy for a more "purified" genome may sound enticing, is there *really* anything to tell us what we have lost in attaining this "purified" version of ourselves? Are we not merely practicing the ultimate form of eugenics if we force this practice upon the entire population and discriminate against unaltered individuals, as was dramatized in the 1997 film *Gattaca*? Given the moral and ethical boundaries that would be crossed in that scenario, it is *not* something that should be practiced in our future society in this author's view.

Going beyond the first two categories, modern humans who rely upon their smartphone or Fitbit to aid their daily lives and tasks deserve their own unique category because the level of intelligence they can attain far exceeds the level of intelligence possessed by a natural human. The complication with defining this group of humans, however, is where the line is drawn between a computer-aided human and one who is cybernetically-enhanced (Jaynes 2020b). For instance, do subcutaneous implants like the RFID chip constitute a *cybernetic* enhancement or a *computer*

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[8] Ideas for what the "right" way to approach computational intelligence development are widely variant, and the author does not subscribe to a single idea given the unpredictability of scientific advancement. However, the author agrees with Lauret (2020) that this approach to a fully "capable" CIS must incorporate some consideration for the realm of intelligence that exists in the human population—psychological or neurological ailments notwithstanding.

[9] Explicated in "On Human Genome Manipulation and *Homo technicus*."

[10] Here referring to communities such as the Amish in the USA, or similarly conservative religious groups internationally.

[11] Further defended in "The Legal Ambiguity of Advanced Assistive Bionic Prosthetics," which examines the legal protections with patients in possession of CIDABPs. As this proposed model applies to this work, however, further subclassifications and definitions will need to be considered to grant us a full model to reference (from a legal and judicial perspective, at least). *See further* "On Human Genome Manipulation and *Homo technicus*."

[12] The argument made by this author is in opposition to those made by Primc (2020), though concessions are duly made for the strength of her argument.

enhancement? This delineation, and others like it, are not ones that have been made legally clear at this date given humanity's lack of available bionic enhancements—and thus become problematic for future labour markets if corporations do not keep up with legal determinations on such distinctions. There also exists the question of where neuropharmacology or psychotropics fit into the picture, given that they range from organic substances to synthetically-developed compounds. Although they are *technically* as much of a technologic artefact as electronic computers, there has not been a need to separate them based on origin to this extent.

And finally, the distinction between what constitutes as a computer-original intelligence and an organically-original CIS has to be discerned given that our technological advancements may lead us to produce CIS that can gain a biologic form and vice versa (Jaynes 2020a, 344). Of course, the first step to this is determining the legal protections enjoyed by non-organic computationally-intelligent entities and how they differ from *natural* human or augmented human entities.

"Skill" Level Amidst CI-Augmented Humans

The most significant barrier today's labour force faces is that of education—at least, in terms of how it is defined and classified concerning *actual* job skills. What the labour market has seen, especially in the past few decades, is an influx of higher-educated hopefuls who have pursued some form of degree or trade certificate that *supposedly* translates into tangible skills required for specific positions in the labour market. While this influx cannot be said to be *harmful* in the sense that the general public is gaining necessary knowledge to improve their overall quality of life, it *is* harmful in that a USA Associate's degree or International Standard Classification of Education level 4 or 5 attainers are becoming the industry's "new" secondary education standard rather than maintaining their standing as tertiary educational levels before graduate studies. This shift also applies to jobs that traditionally only required a USA Bachelor or Master-level education to "qualify" as being well-enough educated to fill. Although this has done positive things for the labour market as a whole, many stories of humanities- or arts-focused doctorate holders only finding employment in professions considered to be unskilled (such as fast food or retail) have been on the rise alongside other field-specific doctorates (Ruben 2019, Schein 2019).

The issue intrinsically is *not* that job requirements have gained in sophistication overall,[13] but that the level of competition for the few jobs that require higher levels of education is simply too great considering how they are few and far between to find compared to other positions. This issue only gains complexity when the growth of possible jobs requiring doctorates realistically only extend to those in the science, technology, engineering, or mathematics (STEM) fields, and the failure for the industry to accept and integrate the social sciences, humanities and the arts for people and the economy (SHAPE)[14] fields. Whether this decline in attention to SHAPE fields is based on the perception of how STEM fields comparatively have displayed a physical change in the world we environ[15] or some perceived lack of need for "soft" sciences in a technology-heavy world, its effects are detrimental for those members of the human population who struggle with mathematics or applied scientific concepts. Other movements such as the STEAM (adding "arts" to the STEM category) have been floated to emphasize the importance of the arts to

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[13] Although there *is* something to be said for "entry-level" job postings beguiling new workers with experience expectations that are *not* "entry-level," insofar as such positions *ought* to exist to introduce inexperienced labourers to either the labour market as an entity or a particular industry. Expecting more than a year of prior experience in such positions is unrealistic if we consider that many recent university graduates cannot hold full-time salaried work while pursuing their education full-time, on account of in-person class schedules and their respective availabilities in a given institution's register. While a company would obviously prefer to have a more experienced worker in a posting of this sort, young professionals are effectively barred from gaining *any* relevant experience when such practices are encouraged or excessively prevalent in a given community or industry.

[14] Attributed from an editorial from *The Guardian*, posted June 26, 2020, which references the development of a counterpart to the STEM acronym by the British Academy's London School of Economics and Arts Council England. *See* https://amp.theguardian.co
m/commentisfree/2020/jun/26/the-guardian-view-on-the-humanities-the-importance-of-being-rounded.

[15] As discussed in another opinion piece from *The Atlantic*, published October 1, 2018. *See* https://www.theatlantic.com/letters/archive/2018/10/letters-the-humanities-are-in-crisis/571081/?gclid=Cj0KCQjwl4v4BRDaARIsAFjATPmVW3tOj-0a8vawqvYqs20x
qHuaX8xfGvZN8maOKJCxzumt8-RzX2oaAi28EALwwcB.

mathematics and physical sciences (Jolly 2014), yet the divide between mathematics-focused fields and those in the realm of the social sciences and humanities continues to grow.

Given how CIS will continue to automate processes previously thought to be solely the responsibility of humans, there is a real threat that less skilled jobs will be lost—from fast food and retail to delivery services and custodial work. Couple this with a move toward CIS potentially handling the labour of several regular white-collar employees at a general firm (Jaynes 2020a, 351-353), and there becomes an increasing dearth of options even for those who are sufficiently “trained” through education. With these potentialities, the call should *not* be for a readjustment of our education systems (Lent 2018; 212, 216),[16] but to find a way for society to sustain its population with citizens working fewer hours as we have been forced to in prior shifts in technologic ages (Marx 1909, 268-330). Such potentiality is shared by scholars of political philosophy; such as Professor Michael Minch, who shared with the author the following observations:

> Obviously, AI will continue the technological trend of eliminating human jobs, and with a vengeance. We need to quickly get beyond the idea of work as the status of nonpoverty, and rethink work in radical ways: perhaps a full-time job needs to be realized at 25 hours a week; perhaps all human beings above a certain age should receive a universal basic income that sustains a decent life, regardless of their working life, and work becomes a bonus circumstance, etc.[17]

Arguably, this is akin to the arguments presented by Marx (1909, 255-330) and would generally be decried in the USA,[18] given its ties to *The Communist Manifesto* and his attacks on the nature of capitalism. Rather than focus on an old, politically-instigated mindset towards one potential system of governance however, society should instead consider how *communal* or *social* various governments have become as technology has advanced in response to the evolving needs of their populations (Tucker 1978, 291-293); seeing as how the nature of supply and demand will inevitably morph into something never before handled by capitalist frameworks. As the mantra goes, *social* safety nets are ultimately *socialist* in their very nature—regardless how much Americans try to argue it being part of a libertarian framework. To decry their societal benefit due to practically ancient resentments towards a specific socio-political climate is the height of ignorance and effectively denies society an avenue to adapt to trials it has never surmounted before.

Conclusion

Ultimately, an intensive focus on education will only benefit society to a certain degree. Too much emphasis on this policy will result in a hefty portion of viable labourers without an avenue to earn a living wage, which in turn strains the existing social networks that may not completely recover after the current international pandemic. As a counterpoint to this, an investment towards HA or HE technologies and medicines may also yield an ineffective solution when considering the long-term impacts their use will have on a society that refuses to grant protections to advanced CIS. Before serious considerations can be made in handling the inevitable changes that will arise with the integration of CIS into various technologies—including nanotechnology, which itself has the potential to transform various industries in its own right completely—a focus *needs* to be centred on the legal treatment of computational intelligence systems and the human-computer mergers that are currently emerging in medicine. By developing litigation and jurisprudence to sufficiently treat these unique cases, society can then begin the complicated process of mitigating the impact CIS-driven technologies will have on the labour market and the future shape it will take.

Conflict of Interest Statement

The author of this work is serving as the Chair for the IEEE Nanotechnology Council Standards Committee, and actively serves as the Secretary for the IEEE P2863™ – Recommended Practice for Organizational Governance of Artificial Intelligence – Standard Development Group

[16] Although such a readjustment may be beneficial to society in other manners.
[17] Michael Minch, Ph.D., Correspondent, email message to author, August 3, 2020.
[18] Although it may arguably not be against libertarian frameworks (referring to the political philosophy, *not* the politically-oriented party of the same name) that structures its society.

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