**Introduction**

         With the rapid rise of supercomputers, artificial intelligence and advanced forms of robotics, recent years have seen a resurgence in interest in automation in the academy (Bissell, 2018, 2021; Del Casino, 2016). Notably, geographers have led in conceptualising how automation is poised to revolutionise almost every aspect of human life. From the manner in which cities and their traffics are organised (Dowling and McGuirk, 2020; Macrorie et al., 2021), to intimate practices of human care and domesticity (Lupton, 1993; Robertson, 2007, 2010), to issues surrounding the ethics and (geo)politics of technology (Amoore, 2018; Crampton, 2018), automation  is widely seen as a catalyst that would usher in profound changes and challenges to the fabric of human existence.

         These perspectives signal a world on the cusp of rupture, as machines reorganise a multitude of human endeavours. On the one hand, some scholars express a concern for the future of work and employment, as industries switch gears towards supporting more automated modes of production. As Dengler and Matthes (2018) warn, the rate of job replacement owing to automation could rise to as high as fifty percent in the next two decades. This trend portends grim implications for labour, as machines not only increasingly supplant their skills and livelihoods, but also threaten to tip the balance over into a situation of permanent disemployment. Other scholars stress the agencies that humans (still) have in adapting to machines, driving new configurations of human-machine interaction. Such a stance echoes Mahony’s (2020) concept of ‘boundary work’, whereby science and technology are not taken to augur static states of disenfranchisement, but could readily open up to new and creative forms of (re)appropriation (Kinsley, 2018; Lynch, 2020a, 2020b). While these authors do not ignore the fact that machines today mimic or even surpass human capacities, they seek to reclaim the potentiality of humans by pointing to possible emergence of new sociotechnical arrangements (see Jones, 2009).

         These tropes have yielded important insights into the mottled relations between humans and machines. But we seek to extend these debates by delving into how automation can sometimes elicit other kinds of reaction that do not fall neatly between capitulation and adaptation. Indeed, human dispositions towards automation are often ambiguous, at times celebrating technology, but at others resisting it. This focus on the inconsistencies between human-machine relations is especially germane to a new generation of technologies—from life-like artificial intelligence to interactive platforms—that are made to interpellate (otherwise-reluctant) subjects through culturally specific forms of appeal (Macrorie et al., 2021; Richardson, 2021; Tay et al., 2016). At best, human-machine relations take on fluid, if also fragile, tendencies swayed by these persuasive designs; at worst, they take on the characteristics of a ‘cruel optimism’ (Berlant, 2011) that appears to promise synergistic co-existence, but in fact fall trap to capitalistic expectations and demands on labour.

Underscoring how users are thus predisposed to technologies in particular ways does not detract from earlier concerns about labour, deskilling, and disemployment, or interventions into sovereign decisions over technology. If anything, it complicates the picture of machine encroachment into everyday life, and reframes attempts at ‘creative’ adaptation within the expected bounds of technology’s governmentalities. Crucially, such an optic has serious implications for the assessment of labour health, and scrambles any easy effort in parsing the relationship between humans and machines. Indeed, it performs a different kind of boundary work (Mahony, 2020) that (also) does not take technology as fixed or singular, but yet locates that unfixity within what we think of as ‘dispositions towards automation’: which we define as the in-process tendencies, or ‘points of meeting’, of human-technology assemblages which enable, creatively rework and resist automation. As we will show through examples drawn from and around existing research on aviation—one of the most (unevenly) technologically advanced industries with elaborate technological infrastructures—automation can take on different forms, values and meanings that may at once appear worthy of opposition but also seem credible, or go unthought. It is on the conditionality of these conflicting relations that we want to emphasise.

The rest of the paper advances these arguments in three sections. In the next section, we consider how recent scholarship has represented automation and its effects, especially through the prisms of labour, infrastructure and mobilities. Possibilities of a more ambiguous state of relations—rather than capitulation and/or adaptation—are then posited. As the core section, Section III goes on to provide readers with a conceptualisation of dispositions, which serves as our framework for a more flexible understanding of human-machine relations. This is followed by a five-part discussion on what some possible dispositions might have been activated, especially by/in capitalist societies meaning to increase uptake of automation for more time- and cost-efficient production; to accumulate innovation and intellectual property; or to stake another site of symbolic, social capital and place branding. Non-exhaustively, the five dispositions we will review are: enchantment, aspiration, experimentation, gamification, and acquiescence, each coinciding with a different capture of technological buy-in in late capitalism. The final section concludes with a reflection on how scholarship on automation can be advanced through a greater appreciation of these (and other) dispositions, particularly how they both steer, and afford opportunities for renewed relationships with technology.

**Automation, Labour and Capital**

Geographic interest in automation is, in many senses, not new (Gertler, 1988; Massey, 1995); but there is also something revolutionary about the way recent types have appeared in a wide range of spatial practices. At times interlinked with other technological terms such as code and software (Thrift and French, 2002), artificial intelligence (Amoore, 2020), robots (Del Casino, 2016), mobile technologies, digital platforms (Ash, 2015; Ash et al., 2018; Plantin et al., 2018) and the Internet of Things (Moriset, 2020), there is widespread consensus among scholars that automation today is no longer restricted to mechanisation, but imbues a degree of self-organisation and self-governance in machines. For Macrorie et al. (2021: 4), such decision-making powers render current forms apt for ‘the augmentation of societal tasks that are highly complex (e.g. diagnosing medical conditions, analysing vast real-time data), precise (e.g. manufacturing), powerful (e.g. calculation and prediction), unattractive and repetitive (e.g. maintenance) or dangerous (e.g. bomb disposal)’. While these technologies sit astride a ‘continuum’ of applications (Torrens, 2010: 138), they cohere by enabling some (and increasing) degree of human non-intervention to advance goals of capital and the political economy.

Such affordances portend a future where machine-human relations are becoming more discordant and fraught. At its most extreme, automation can be—and has been—combined with instruments of war as methods of control, aiding in the ‘persistent presence’ of the mobilities of military interventions and political intrusions into civil life (Kaplan, 2020; Williams, 2011). Under more ‘peaceful’ circumstances, the autonomous car has equally assumed a role as a kind of fetish enabling a future of pervasive computer control over automobility—a contrast to the usual message of liberal freedoms and personal agency (Dowling and McGuirk, 2020). On closer look, the autonomous car furthermore seems to extend longstanding gendered and racialised relations and subjugations in society (Hildebrand and Sheller, 2018), and even a branding gimmick to foster the sales of considerably cheaper internal combustion engine vehicles. For Atanasoski and Vora (2019), seeing automated machines as a sort of ‘technological surrogate’ of human life who are imagined then of not having to do putatively ‘dull, dirty, repetitive, and reproductive work’, is often associated with ‘racialized, gendered, enslaved, indentured, and colonized labor populations’, inheriting the ‘tension between humanization and dehumanization’ that is at the heart of Western European and US imperial and military projects (cited in Lynch, 2021: 2).

Automation has further sparked misgivings about the use of technology—especially artificial intelligence and cloud computing—to arbitrate the decisions of/in life. As Amoore (2020: 5) writes appositely on this subject, algorithms are problematic not just for the way they police and regulate populations from the outside, but, more significantly, ‘are implicated in new regimes of verification, new forms of identifying a wrong or of truth telling’ that can impinge on ethicopolitical notions of good and bad, normality and abnormality, which Amoore has explored in the context of security and migration regimes at the border. Kitchin (2017) makes a similar point when he argues that today’s software possesses social power, having the capability to mediate, augment, produce and regulate socio-economic outcomes through automatic structures that are difficult to decode once set in motion. Thornton (2018) further demonstrates how Internet search algorithms reproduce and exacerbate capitalist formations in the valuation, ranking and re-structuring of language and its meanings, with jarring yet often unthought and problematised effects on the geographies of the written word that flow through the Internet’s informational architecture. As more and more of tasks are yielded to these opaque, ontogenetic but infrastructural systems of moving, sorting and deciding on data, in the background of our habits, routines and working practices, life’s processes also become diluted and simplified, leaving the work of arbitration and judgment to machines.

On the flip side of the same coin is a question of labour’s reaction to these changes in the economy. If machines are capable of determining life’s outcomes on autopilot, they also portend a reduction of tasks needing to be completed by humans. Accounting for the broad range of mechanical capacities and human-like intelligences that machines have acquired of late, some scholars suggest that automation may severely erode workers’ bargaining power, if not outright present a threat to their survival. Already, predictions of an uptick in mass labour replacement and disemployment are rife. While West (2018) draws attention to the falling costs and newfound agility of robotic devices, Bastani (2019: 93) argues that any new professions gained because of automation (e.g. in the technology sector) are not going to make up for, or ‘compare to [the] driver, cashier or construction worker’ lost in terms of ‘the historic volume of work they create’.

Notwithstanding, some geographers have cautioned against exaggerating automation’s takeover. As Del Casino (2016: 847) notes, ‘[w]ith the advent of robots and robotic technologies, labor systems, the social relations of production and the types of work being done are further co-constituted by a new class of machines’, not replaced by them. Richardson and Bissell (2019: 278) posit a ‘micropolitical understanding of skill’, which provides latitude for labour ‘re-skilling’ or ‘up-skilling’, as workers adapt to automation and get redeployed to positions further up the value chain. Lynch (2020a, 2020b) elsewhere envisions the possibility of humans reclaiming ‘technological sovereignty’ through everyday counter-hegemonic practice that goes against the grain of technology’s intended use. As he asserts, banal improvisations and ground-up initiatives spark visions of other capitalist futures that can disrupt the abstract logics of formal technological design. These ruptures to invented products are not always significant, but they do provide an avenue for everyday labour to turn unsuspecting technologies into uses they were not originally designed for.

Geographers have further examined the role of nonhumans as equally viable agents responding to automation. Bear and Holloway (2019) offer some insights for rethinking how animals—in their case, cows—can be embroiled in robotic processes. Specifically, they rebuff the notion that cows simply ‘resist’ or ‘transgress’ machine milking, leaving farmers to deal with their recalcitrant behaviour. Questioning the characterisation of animal autonomy in such hierarchical ways, they propose a ‘seepage’ they call ‘divergent conduct’ in these interactions between technology, labour and animals. For them, divergent conduct refers ‘to the multi-dimensional, topological and situated relationships between humans and living and non-living non-human entities, each with potential to make various differences to situations through the multiple material and affective capacities produced by and effecting the inter-relationships’ between them (Bear and Holloway, 2019: 219). Thus infusing bovine bodies, farms, barns, and not just human labour, into technology, their thesis underscores how automation needs to be understood through a collective of agents that are mobile, interactive, if sometimes oppositional. These agents are relationally mediated through ‘situational human-animal-technology knowledge-practices’ that are inherently multiple and destabilising (Bear and Holloway, 2019: 219). The actions of one cannot be disassociated from those of others in the same orbit of encounter.

This focus on everyday encounters with automation has been a useful counterpoint to earlier approaches that concentrate on critiquing the logics and ‘deep social implications’ of automation (Del Casino, 2016: 847). Whereas one stresses the practical contentions with technologies through complex and indeterminate relations, the other presents roadmaps of automation’s (or their creators’) intents and effects. However, between or perhaps running alongside the two, we want to suggest another space of relations where structure and practice are parsed in difficult-to-distinguish ways, and within tendencies that can drive the proliferation of automation itself. Geographers, in fact, allude to this tension when they cite conundrums such as the enduring ‘gendered divisions of labor’, alongside issues ‘related to inequality and difference and the complex co-production and sociospatial organisation of home and work, production and reproduction, as well as identity and subjectivity’ (Del Casino, 2016: 847), *despite* thebelief in the technological sovereignty of humans. Suggestively, the uneven landscape of automation points to the patchy way in which different social groups are (un)able to transcend the borders of technology as laid down by capital (cf. Mahony, 2020). As feminist scholars exemplify, machines that streamline business workflows often end up prejudging and dividing people by gender, bifurcating them according to how well they fit within preconceived logics in technological design and artificial categories (Lupton, 1993; Robertson, 2007, 2010). Such differentiations not only frustrate human adaptation to automation, but may even have the converse effect of fixing certain marginalised groups of labour in place.

The rest of this article will now sift through the processes that might have allowed automation to thus flourish despite its contrary tendencies. In particular, we delve into how the promises and diverse reception of automation do not fall neatly between capitulation and adaptation, but messily skirt around various cultural dispositions that capital actively, if also stealthily, encourages. To put plainly, we are interested in how particular dispositions towards technology may actually be helping to smoothen automation’s entrenchment. This focus does not seek an oppressive, totalising view of automation, but acknowledges the fragile state of human-machine relations that can vacillate between different states of acceptance and resistance. We underline that human-machine encounters need to be contextualised, in order to understand how decisions and practices related to technology are culturally embedded and enacted. In the following, we will flesh out five dispositions that can influence these decisions and practices. We turn to aviation and its myriad technological infrastructures for our inspiration.

**Dispositions Towards Automation**

Air travel and the magic of flight have commonly elicited senses of adventure, awe, wonder, romance and other reactions, such as submission, pressure and fear. Some of these sensibilities are derived from practical (and often-affective) encounters with actual objects and events, particularly the technological wonderment at the power, complexity and equally visceral sense of the force or energy of aircraft and the infrastructures that serve them. Within movements such as futurism, the aeroplane’s transformation on human perception, feeling and action was highly fetishised (Bergmann, 2008). Perhaps one of the most high profile forms of automation has been the so-called ‘autopilot’, and the ‘fly by wire’ (Langewiesche, 2009): aircraft architectures which have allowed pilots and aircrew to distribute responsibility to the aircraft’s systems, and its automated processes of sustaining flight and navigation, and augmenting control over the aircraft for pilots and aircrew. Yet our awareness of these processes have been gradually backgrounded in the normalisation and mundanity of commercial air-travel. The jolt and shock of the sensation of the technological modernity of the railway (Schivelbusch, 1986), was of course also subdued through learnt habits and expectations of travel and through classed, raced and gendered divisions and distinctions.

It has been important to understand these sensibilities as they have been learnt and filtered through cultural norms, traditions and expectations of people. In our discussion on aviation and automation, we want to pinpoint some of these senses and how they serve as in-process tendencies and points of meeting that are not necessarily held in any one body or ideal sovereign autonomous subject. Focusing on what we conceptualise as ‘dispositions towards automation’ recognises the wider cultural and technological milieus that informs automation’s use, as well as the fragile state of human-machine relations as they are anticipated and unfold.

Geographers are not unfamiliar with the term and concept of disposition. As Lorimer (2005) explains, dispositions are among those intangible pushes through which life takes shape and gains expression. On par with ‘shared experiences, everyday routines, fleeting encounters, embodied movements, precognitive triggers, practical skills, affective intensities, enduring urges, [and] unexceptional interactions, they constitute a class of life’s excesses that determines our being in the world’ (Lorimer, 2005: 84). In this vein, some scholars have described and understood dispositions as a collection of affective responses to various familiar stimuli, ranging from memories of the past (Waterton, 2014), tourist landscapes (Edensor, 2006), as well as ‘affective infrastructures’ that modulate action (Barnett, 2008).

Others have stressed the structural frameworks within which dispositions emerge. Underscoring the importance of these normativities, Paterson (2009: 779) argues that focusing on ‘the immediacy of conscious sensation and cutaneous contact’ only tells part of the story; entangled within the present are also ‘historically sedimented bodily dispositions and patterns of haptic experience that become habituated over time’. Here, Bourdieu’s (2015) idea of habitus becomes salient, not only as a signifier of embodied routine, but also as a ‘structure of common sense’ that confers meanings of power and/or identity to practitioners (Cresswell, 2002: 380). For Bourdieu, habitus speaks of a practical systematicity. It is not static or monolithic, but it can be conditioned to form a loose unity, character and style. As Bourdieu elaborates, the result of this loose adherence is a set of ‘dispositions’ that are more-or-less long-lasting, that tend to perpetuate, and that are prone to reproducing themselves. Taken together, while, on the surface, dispositions may appear random and free-forming, they are often already conditioned by such wider frameworks and norms that pre-dispose, and precede, their existence, even if they themselves may well be in transition.

Our approach to this subject is, however, inspired more directly by the geographer David Bissell who has explored embodied dispositions in a multitude of contexts but especially with regard to mobility and technological change, which is an apt setting for our research. Indeed, Bissell (2021: 378) has written extensively about how everyday and fluid encounters with automation, coupled with a cognisance of feelings towards it, can contribute to activating particular dispositions and subjectivities among technology’s users effecting their capacities to affect and be affected. The kinds of dispositions Bissell explores are, moreover, not necessarily active, as he and others (Connor, 2019) have sought to give name to more negative or passive dispositions involving the diminishment of capacities: for example in acquiescence, loss or ‘giving way’. Variously, Bissell’s research on transit spaces; the experiences of miners adopting new technologies; or gig-economy workers feeling the pain of divestment in relation to changes in work practices and their feelings of economic insecurity, all adopts this more generous embodied notion of disposition, but which does not see dispositions reductive to the body. Instead, dispositions appear as socially and culturally inflected and transmissible affective capacities to affect and be affected in each encounter and setting, and even in the way those encounters are represented and performed in storytelling (Bissell, 2021), and we could add other forms of writing, talking and visualising automation.

For example, Bissell (2018) thinks about the role of different media in shaping dispositions by ‘dispersing’—through the site of an accident promulgated by different media sources of transmission—understandings, opinions and feelings around autonomous vehicle technologies as well as the reputation of the company Uber. In his account, this is more than communication, but the way that certain media messages accord with other assemblage effects, which include other prior events and accident-al histories. The message of the present context (the accident), then, ‘resonate within an experiential field that is conditioned by the charge of a series of previous events’ (Bissell, 2018: 62). A disposition towards automation is, as such, not static but gradually shaped through or transformed by multiple events and media that accord in affinities with one another.

Not unattentive to the performative *and* representational forms dispositions may take, our approach further considers dispositions as more assemblage forms too. Following Bissell’s concern for resonance, we find additional purchase in William Connolly’s (2005) notion of a ‘resonance machine’, mobilised by some geographers to make sense of nationalism and the formation of affective atmospheres (Adey, 2014; Closs-Stephens, 2016). In seeking to understand the political alliances and affinities between evangelical Christianity, capitalism and American right wing politics, Connolly turns to ways of thinking about relations which depart from simple linear causation. For Connolly, ‘complex-Causation as resonance between elements that become fused together to a considerable degree. Here, causality as relations of dependence between separate factors, morphs into complexities of mutual imbrication’, and this is what allows, he writes, for ‘unconnected or loosely associated elements’ to ‘fold, bend, blend, emulsify, and dissolve into each other, forging a qualitative assemblage’ (Connolly, 2005: 870). We draw inspiration from Connolly to explore dispositions to automation as constituted in and through such assemblages where particular dispositions are located, and not then in or necessarily of the body or a single entity itself, or simply passed on in a causal or linear mode of transmission. Such resonances are felt and cognitive, material and informational, in the ‘soft tissues of […] as well as the upper reaches of the intellect.’ Connolly (2005: 873) argues that such ‘complementary dispositions’ allow disparate things to ‘crystallize, amplify, and legitimize the dispositions of the whole’.

We contribute to these debates, then, by not only foregrounding dispositions towards automation, but also considering how these dispositions may spontaneously build on, interact with, and perhaps are even in conflict with wider forces, encounters, and cultures in life. There are of course issues with attempting to find names for these things. As Steven Connor (2019) describes the difficulty of naming more negative dispositions or ‘comportments’ that are ‘rarely themselves spoken of’, we recognise that naming infuses our own articulation of dispositions to automation with a performative flavour, and which shifts our own thinking and feeling as we say and write it. In the remainder of this section we identify several different but related dispositions towards automation, but we do not presuppose their stability. ‘Dispositions towards automation’ may reflect different stages of transition or transformation, reactions to its speed or suddenness, or more imperceptible slow creep changes that becomes something else when automation has passed, decayed, or become present, even in the background.

*Enchantment*

The automation of mobility might seem relatively abstract, but yet at the same time no less significant. Exemplarily, an encounter with the airport border appears at once an outcome of calculative logics and processes, inferences and abductive decision making (see Amoore, 2018, 2020 discussed above), even if its effects on the governance of mobilities can be the stark denial of entry. While border automation has become an obligatory point of passage—it is very difficult to ‘opt out’ of different forms of airport processing—even those of border security, may rely upon *enchanting* possibilities which we consider as a kind of technological ‘fetishisation’ (Harvey, 2003) that mystifies relations between capital, labour and technology.

Enchantment has been a common modality of the persuasiveness of automation animated by an ‘attachment’ (Anderson, 2017) to feelings of wonderment, magic and mystery, and to some extent, positive senses of the confusion and excitement that can come with automation. Automation can be intended more to wow publics, markets and investment capital, rather than to provide or fulfil any particular need—certainly its relation to concerns around productivity and efficiency are highly uneven and overstated. Enchantment is equally a way of fetishising labour, bodies, social relations and racial politics, as Atanasoski and Vora (2019) explore—which means to conceal and depoliticise the very processes that might underpin or be a consequence of automation. As Campolo and Crawford (2020: 8) suggest in the context of AI, enchantment inclines one towards different affective and aesthetic categories such as optimism, mystery and magic through which machine learning’s unexpected and unforeseen workings have been felt, discursively constructed, hyped and communicated, even ‘while operating within a predetermined set of rules and outcomes’.

Within the contemporary infrastructures of air-travel, automation is often used to orient passengers towards this assortment of delightful dispositions too. Automation is not necessarily about replacing labour, but about seeing airports as major national engines of innovation driven economic development and attaching those meanings and the excitement of automation to ideals of industrial advancement and even national progress. At Incheon Airport in South Korea, passengers are encouraged to pose and have selfies taken with a robot at known as Airstar, who will also escort passengers to a shop or gate in the terminal. In 2016, a similar robotic aid was launched in Schiphol airport by KLM named ‘Spencer’. For one commentator critical of Incheon’s efforts (Fraser, 2019), the robot is surely a soulless gimmick: ‘First Class passengers expect human servants, their hearts would collectively stop beating after being talked to by a machine[...]’. These examples demonstrate something of a veneer of superficial automation intended to do some of the ‘softer’ face-work of airport labour, and captivate passengers by attending to social, sensual and affective relations (Ash, 2010). And yet, the mystified enchantment of automation may underpin and naturalise other, far more mundane, mechanical and invisible but also more insidious processes that support the mobilities of not only passengers, but primarily their baggage and their data. Suggestively, these enchanting and enthralling automations could enable the creep of more data-driven, pervasive, and potentially discriminatory forms of mobility (and automatic) management, by first priming certain favourable passenger dispositions towards themselves.

These passenger-facing robots can be framed within broader and more critical stances that can help demystify capital’s relations with labour, production and consumption. In-common with a tendency to see airports as major national engines of economic development, Incheon’s ‘smart airport’ concept, for instance, emphasises efficiency, the optimisation of airport processes, the control of passengers, and actual robotic industrial and consumer developments including a robotics theme park, a robotics innovation centre and other innovation and commercial enclaves with glossy names such as ‘Sky city’, ‘Dream Island’ and the ‘Inspire’ integrated resort. The slightly silly robotic helper and selfie magnet, helps to bundle up technologies of delight—even if they may be met by disappointment and annoyance —in a wider context of the economic and commercial growth of the Incheon as a commercial, innovation, logistics and leisure hub, while binding apparent passenger comfort and ease with other surveillance, security and airport labour practices. Reflecting the same vein of dispositions towards such automation, John Kasarda, author of the so-called Aerotropolis airport city concept and celebrant of Incheon’s economic engine, summarises such technologies, with his co-author Chen, as follows:

For departing passengers, biometric authentication eliminates the need for multiple passport verifications. Computer vision algorithms reduce security processing time for X-ray scans while improving security. ICN’s self-service bag drop stations automatically measure luggage weight and dimensions and can deliver baggage directly to passenger aircraft while self-driving indoor vehicles enhance personal mobility and wayfinding. [...]A separate fleet of autonomous cleaning robots enforce higher standards of airport cleanliness. (Kasarda and Chen, 2021: 7).

Automation’s enchantments might even shroud what we think has been automated, and why. The recently opened Jewel at Singapore’s Changi Airport is one example of the bewildering display of technological prowess to produce a dramatic 130-foot waterfall or rain ‘vortex’ at its centre using recycled rainwater. With automated lightshows and added mist, surrounded by an indoor forest and tiered gardens, the waterfall is shielded behind glass for three stories at the base. Above, the driverless skytrain passes through the Jewel, or by the rain vortex more specifically, as the automated vehicle connects the different terminals. The Jewel development is perhaps the latest form of the phantasmagoric, excessive commodity worlds of exhibitions, arcades and shopping malls (Goss, 1999), designed to produce a kind of ‘delight’ that will surprise passengers (Forbes, 2019) in what is advertised as a ‘kalaideoscope of wonder’ as pseudo-natures are brought indoors.

Part of the rationale behind the attraction is to increase retail revenues and encourage people to use Changi as a hub airport—such is the economic model of many international airports and the importance of international transfers to Singapore. The Jewel is a way of enlivening or the ‘*re*enchantment’ (Buck-Morss, 1989) of the aeromobile experience. ‘24 hrs a day’, which has been historically—albeit away from its more exciting Jet age (Schwartz, 2020) and interwar innovations and enthusiasm—been rendered as a dreary set of stressful experiences of queuing, waiting. The descriptions around an attraction like the Jewel, see it reproducing a heightened artifice of nature which might awaken the aeromobile passenger, itself a product of late-capitalism and imperialism in the form of international mass passenger air-travel. Reifying flight’s banality, which has turned passenger flight into a new kind of labouring (Lassen, 2006), the Jewel tries to turn aeromobile passage into an exciting, consumer proposition (and disposition)—a ‘long lived wow’, as the architect Moshe Safdie and the so-called ‘user experience’ (UX) team of the airport that design and manage Jewel suggest.

The enchantment of Jewel’s automation spills over to shape people’s dispositions towards the airport’s functions as well. Changi portrays its automation at Jewel as ‘subtle’, ‘foundational’ technologies that keep the air cool, clean the floors after hours, and dry spillages, or use facial recognition to profile users before they engage with the visual displays screens on the terminal floor. Perhaps less subtle is its security ‘Robocop’ autonomous Patrol and Traffic Enforcement Robot (PETER) that polices the arrivals setdown area for waiting cars outside the terminal with threatening noises and the ability to call a security agent to move on a disruptive vehicle. Run by Certis—an Auxillary Police Force in Singapore—media reports describing the robot hint at the wider data-driven management of security operations at Jewel, and the ability for robots like PETER to reduce the need for humans to perform more ‘menial jobs’ so that they attend, vaguely, to ‘important security issues’. In a loopback to Incheon’s Airstar, automation here inures us to invisibilise labour itself. By celebrating enchantment as a ‘long-wow’ disposition to uphold, the plight of (often poorly-paid) workers in the airport becomes erasable, and rendered more acceptable by capital.

*Aspiration*

Closely following on the heels of enchantment is a simultaneous sense of aspiration embedded within automation. Here, that which is enchanting and magical is projected forward in time, promising a future of ever-increasing productivity through present consumption of technology. In many ways, this conflation between machines and future expectations is not new in aviation. Aeromobilities, commonly expressed through state-of-the-art airports and parades of gleaming new aircraft, have long held up technology as a symbol of aspirational modernity (Bok, 2015; Koch, 2010), and a shorthand for announcing the arrival of a country or city from its ‘backward’ state to a ‘utopian’ future (Amir, 2007: 287-289). Urry et al. (2016: 19) elaborate on this point by writing that the airports of today are deliberately engineered as ‘globalised open world[s]’, replete with new-fangled technological marvels such as indoor wave-riding pools (Munich), and virtual-reality augmented arcade games (Dallas-Fort Worth). Being such distinctive centres of commerce, airports have become extensions of the aspirations of whole cities and nations, and symbols of their tomorrow.

In recent years, airport automation has become the latest lynchpin with which to pursue such technological futures. Far from being repulsed, airport automation increasingly incorporates subtle sensory and affective cues to intrigue users (Sumartojo and Lugli, 2021). Whether they be self-service kiosks, automatic bag-drops, smart borders or boarding gates, these machines are often accompanied by conscientious design schemes—involving sleek appearances, clean digital interfaces, attractive light features and, more concretely, physical separation between analogue and digital passengers—to interpellate and create subjectivities commensurable with the arrival of the said future.

What is more, they are concomitantly synonymous with speed and tech-savviness, befitting of a modern citizen class cultivated to abet capital’s aspirations for mass globalisation. A prominent aerospace equipment supplier, Thales (2021), is unequivocal about how digitally-enabled automation portends such a sped-up ‘future of travel’:

Electronic Visa Authorization systems, cloud-based passports, secure credentials on mobile phones, digital identities, and biometrics can simplify international travel as they eliminate the need to carry a physical passport or obtain paper-based visas. They speed up border crossing, streamline the traveler experience and shape the future of travel.

As Hirsh (2016) observes, such designs not only threaten to displace those who, due to technological illiteracy, are incompatible with these new frameworks; they also openly celebrate individuals who carry themselves with the same aspirational dispositions and outlooks, and who are willing to become service providers of themselves.

Beyond passengers, airport workers can similarly be cajoled into being supportive of the progress of airport automation. Knox et al.’s (2008) ethnographic study on the use of digital information and communications technologies (ICTs) in check-in, air traffic control and baggage handling at ‘Fulchester’ International Airport, UK for instance finds an equally sympathetic workforce that had developed an affinity for ‘essential’ digital tools for twenty-first-century airport management. While acknowledging that ICTs are not foolproof, the research evinces how airport managers esteemed ICTs for being enablers of speed and efficiency, even as these ‘supplementary dimensions of organization’ redirect attention from personal service to data and flows (Knox et al., 2008: 883). In more recent times, labour is called upon to adapt to automation-related changes in minutia processes too. Often presented as ‘fun’ and ‘cool’, gadgets such as doll-faced automatic sweepers (for cleaning), follow-me trolleys (for chaperoning passengers) and smart glasses that double as barcode scanners (for cargo handling) put airport workers in an invidious position of having to reorient their dispositions towards these unfamiliar gadgets that ‘promise’ better—read, faster—working styles (Sumartojo and Lugli, 2021). Here, automation not only has the effect of undercutting labour’s role and livelihoods, but also pits (remaining) workers against seemingly benevolent aspirations that are difficult to resist.

The cultivation of such dispositions of aspiration can spill over onto the national scale as well. Schiphol Airport in Amsterdam, for one, aims to have fully automated taxiing by 2050, using the scheme to rally citizens into believing ‘that a combination of Dutch cleverness, inventiveness and the close collaboration of all stakeholders, will further sustainability in the short, medium and long term’ for the country. Similarly, in India, the *Ude Desh ka Aam Naagrik* (UDAN) scheme to increase air connectivity and develop digitally enabled infrastructures promises 1,000 new air routes and 100 new airports by 2030 to move the country to a ‘developed’ status. Datta (2019) contends that such eager projections of automated solutions need to be read in light of the deployment of two parallel mythologies of the future, namely, nationhood and technology. Explicitly, she argues that ‘while nationhood constructs a mythology of the future, technology too begins to acquire mythological dimensions as the only possible future’ (Datta, 2019: 395) that peoples of (especially) ‘developing’ countries need to strive towards. Seen thus, the aspirational allure of automation has a potentially conditioning effect on human responses to technology, stirring up a disposition that tends to contradict healthy misgivings about these fantastical ideas.

As part of a more speculative future, the disposition of automation-as-aspiration further resonates with emerging aerial automated technologies in the home, rather than the airport. In analogous ways, some of these technologies have challenged traditional forms of production as well—or, more precisely, social reproduction. As Jackman and Brickell (2021: 13) write in their feminist geopolitics of the domestic drone:

convenience, efficiency and cleanliness are attributed to the drone. In contrast to, and mitigation of, human failings of inattention, the drone is positioned to perform the care work needed to sustain plant life; its shadow ever-present on the rug of a pristine high-rise apartment…

Through some extraordinary portrayals of aerial drone plant watering, or drone cleansing and sanitisation, these machines seductively replace (often-female) social reproductive labour, and doubles as a new consumer object of desire in the ‘smart home’ (Huws, 2019). Not unlike similar labour-saving technologies in the airport, automation here helps transform the domestic sphere into another market for capitalism, catering to dispositions of progress and upward mobility.

*Experimentation*

Automation may have been linked to ‘promises made in the present about our future’ (Anand et al., 2018: 27): of better networks, smoother flows of people and capital, and fewer bottlenecks. Yet most new automation projects start out as experiments; they take time to plan, test, and implement, and may end up only benefitting a small segment of the population, due to the inability of the project’s ‘scalability’ or to reach diverse users in an uneven sociopolitical and economic landscape. James Maguire, in his work on the various flying machines that existed before airplanes, uses the idea of *prototyping* to explore how not-quite-there aerial technologies were understood, taken up, put into use, or, sometimes, one of the above. While the meaning of ‘flight’ had not yet stabilised by the early 1900s, the practice of prototyping various flying machines generated both skepticism and enthusiasm, creating a social vision of a future world ‘attractive enough to mobilise an infrastructure of support’ (Maguire, 2018: 26). Automation-as-experimentation, like the shaping of early flight is an equally malleable disposition, as new automative projects are negotiated, introduced, taken up, fail, gain support, or are slowly incorporated into daily lives. Some thinking has even prepped the airport itself as an experiment for the city or public space. Paul Virilio’s commentary on the hyper-securitised and increasingly digitised airport, sees it is as a ‘breeding and testing ground’ for new ways of organising and securing life (cited in Lacy, 2014: 60).

Scholarly work on ‘smart cities’ and ‘smart’ urbanism in particular focuses on how various robotic prototypes, trials, and experiments fundamentally restructure and shape places as well as the mass movement of humans (Macrorie et al., 2021; While et al., 2021). Not only do such prototypes restructure the roads, networks, and features of cities themselves, but they also create a more complex effect ‘across multiple domains of urban life,’ creating opportunities for more extended ‘ecosystems of automation and robotics’ (Hunt, 2018 cited in Macrorie et al., 2021: 201). A single experiment can thus expand the potentialities of mobility ‘beyond human abilities’. Take for example City Brain in Hangzhou, which notifies police in real time about traffic accidents and violations (Macrorie et al., 2021: 206), or the Taxibot – a pushback vehicle used to tow airplanes onto the runway, intended to significantly cut down on emissions and wait time at the gate. While—or precisely because—the Taxibot is not yet fully automated, it invites users to indefinitely rehearse one type of future in order to, perchance, bring the conditions for an automated airport into being. This stretching of possibilities and understandings of automation’s reach can mean that there is no clear-cut line where an ‘experiment’ begins and ends. Increasingly-automated or eventually-automated spaces provide a base architecture for the movement of people and things in a manner that toes the line between control and conformance, lending a hand to the feeling of ‘it’s here anyway, we might as well go along with it.’

In aviation, automation is trialled in order to test new ways of facilitating more and more frictionless flows of people and things to, from, and through airports. Hirsh (2019) has, for instance, written on the role of automation in the redesign of how a passenger travels from their home to the ‘smart’ airport, decoupling their baggage and sending it off on its very own route to check-in terminals in cities like Hong Kong. In another experiment, ‘intelligent baggage trolleys’ prototyped in a testing facility in Denmark are used to move passengers through the airport from security to the gate, where the trolleys—connected to a mounted tablet—are pushed through a security scanner by the passenger, eliminating the need for unpacking any bags during security check (Ilkjaer, 2019: 8). The tablets are designed to feature ‘points of interest’ (i.e., retail outlets at the airport), and the user testing itself forms part of a larger company narrative enabling the growth of more spaces for scalability and profit generation. The introduction of new automated technologies such as the intelligent trolley is partly advertised as providing a ‘seamless passenger experience’ but it is also used to solve siloisation issues—in other words, how to more efficiently coordinate and bring together disparate functions of the airport such as ground handling, security, and passenger services (Ilkjaer, 2019: 8). Automated experiments garner additional support when they can be seen as providing fixes to *other* longstanding problems—including that of increased revenue generation – thus encouraging a new disposition for humans and machines to ‘meet’ in the middle.

In logistics operations that involve heavy lifting such as baggage handling or aircraft repair and maintenance in the hangar, workers have also been called upon to experiment with processes that entail less physical labour. Such a landscape aims to enhance existing human abilities through robotic solutions. One of these ‘solutions’ is the exoskeleton, a high-tech wearable robot or suit that augments physical abilities in order to facilitate movement such as lifting cargo or to prevent repetitive stress injuries from activities like riveting fuselages. Power suits are not new; as familiar features in science fiction and other imaginaries—from the 1959 novel Starship Troopers, to Marvel comics’ Iron Man, to the Caterpillar P-5000 Work Loader in Aliens, to the exosuits in video games like Halo and Fallout—the gradual temporality of automation does not suddenly transmute into a science fiction world, but appears as another bodily enhancement drawn directly from science-fiction imaginations where tinkering with the body’s capacities is a signal of ingenuity and risk taking.

Today’s airport exoskeleton suits boast a dual function: its protective nature for one’s health, as well as its ability to make additional labour possible. For example, the advertising material for the Sarcos Guardian XO (a suit of ‘superhuman strength’) trialled by Delta Airlines, reads: ‘in cases of airline disruptions… employees must sort baggage manually to prioritize short-connection baggage’ suggesting that new exoskeleton products can be used to enhance the continued growth of the aviation sector. Since full automation is not yet possible, humans are—and will still be—needed for numerous functions in the airport. And yet, in order to keep up with aviation’s circulations of capital, the human is not enough anymore. The Guardian XO is marketed to help ‘employees stay in their current role for longer’ solving the problem of retaining a sufficient pool of labour in aviation mechanics, a field where considerably more workers are retiring than entering. Human-machine hybridity by ‘experiment’, then, forms part of the process of encroaching automation by capital, where specific dispositions are popularised and harnessed. In this instance, exoskeletons have become conducive due to their protective role over bodily health and the longevity of labour.

*Gamification*

Besides professing to improve efficiency, automation has also been designed to accrete various material and affective qualities to smoothen its uptake among labour. Indeed, automation has become an important part of new platform service economies, such as delivery services, which have become part of the new infrastructures of work. As Richardson (2020: 620) writes in relations to the food delivery business, platforms crucially enable ‘[t]he coordination of… human labour… automated through the algorithm, and in the process… make a market’ of commodities and products mediated by mobile workers enrolled by these technologies.

In the airport, it is the automation of ground transportation, through ride-hailing apps, that has become noteworthy. Booking apps like Uber invoke certain kinds of magic and concealment through a sort of game-like representational trickery, playing on (false) perceptions, urgency, competition and reward to alter behaviours (see Fuchs et al., 2014). Specifically, users are frequently subjected to so-called ‘phantom’ representations of nearby cars (as explained by Hwang and Elish, 2015), which use expressions of near and far in order to induce or entice users to book vehicles. The demystification of these practices by journalists, publics, unions and academics has played an important role in examining the unequal social relations the platforms depend upon and produce, ‘Whether you are a driver or a rider, the algorithm operating behind the curtain at Uber shows a through-the-looking-glass version of supply and demand’ (Hwang and Elish, 2015).

While the attractiveness to consumers of platforms like Uber might speak to or resemble the enchantments discussed earlier, other modalities of encouragement and take-up are especially pertinent for the way they are engaged with not only by users—who are subjected to gameified inducements within loyalty programmes and competitions—but drivers and their precarious position as (self)employees. Indeed, aviation’s own frequent flyer programmes are perhaps early models of gamification techniques to induce customer loyalty (Schrape 2014). These persuasions in part follow a logic of gamification (Mason, 2018), or what Woodcock and Johnson (2018: 543) call: ‘the imposition of systems of regulation, surveillance and standardization upon aspects of everyday life, through forms of interaction and feedback drawn from games (ludus) but severed from their original playful (paidia) contexts’. Companies like Uber use gaming techniques that directly bear on the feelings and experiences of labouring bodies, most often in an attempt to encourage drivers to work longer and in ways that may be less beneficial to them. Gamified governance and labour practices can lack the ethical affordances of other kinds of gamified play (Sicart, 2015). Grab, a self-declared Singapore-based ‘super-app’, has been very explicit about using incentives such as its Spin-to-Win game in order to engage and encourage drivers to drive more. Grab uses gamification through an ‘incentive experience’ the company describes as ‘delightful yet unobtrusive’, to increase driver ‘[w]illingness to take passengers’ which is measured in percentage increases in rides driven (Sachdeva et al., 2017).

 Wells et al. (2021) offer an analogous analysis on how the Uber platform seeks to further align the dispositions of labour to augment production, this time through its algorithmic tendencies that create inducements but also a certain ethos of play and competitiveness to the drivers’ mindsets. Likening the platform’s labour management style to the way materials for assembly lines are coordinated in a ‘just-in-time’ manner, they write that drivers are digitally mobilised to ‘end up in just the right place for Uber’s services to be offered’ (Wells et al., 2021: 317). Through a case study on Uber drivers servicing Washington DC’s Ronald Reagan National Airport, their paper examines how the mediation and automation of tasks involved in the platform economy of ride-sharing and ride-hailing taxi services work to exploit and atomise workers, while making them feel like they are in control. Feelings of self-determination are an essential part of the gamification ethos, ‘to keep as many drivers working, and on the platform as possible’ (Attoh et al., 2019: 1014). The platforms perform what Ash (2010, 2013) has described elsewhere as techniques of captivation within video games, using gamified affective and economic inducements to keep on driving.

A fast-rising gig-economy platform in Indonesia and other parts of Southeast Asia, the Go-Jek ride-hailing system has become equally contentious for what Nastisi (2017: 22) calls gamification by ‘algorithmic evaluation’. Go-Jek’s platform uses multiple metrics to evaluate the driver’s performance and calculate their effective pay, and where pay rates are lowered, incentives based on bonuses are turned to—enacting what Nastitsi (2017: 27) characterises as a combination of optimism and ‘a constant math game of calculating their performance’. As one of Nastisi’s (2017: 32) respondents summarised, ‘today Go Jek won again and I am game over’.

Gamified apps while cultivating positive feelings of reward, like optimism, as well as senses of risk-taking and fun through inducements further involve an undertow that irritates other dispositions by suppressing social relations and organisation, especially amongst drivers. Platform’ surveillance and anonymous systems, and just-in-time coordination of prospective passengers with drivers, has meant that drivers for companies like Uber are discouraged from making contact with other drivers, and are therefore largely unaware of them. This ‘socio-spatial isolation’ by design ironically causes drivers to feel a sense of superiority to their colleagues, whom they view not as peers, but ‘as competitors to be beat or unknowing dupes to be pitied’ (Wells et al., 2021: 323). Similar to the way other gig economy workers like food delivery workers are made to feel like ‘entrepreneurs’ or ‘bosses’ of themselves (Barratt et al., 2020), automation not only materially impedes workers from congregating or organising for collective action (Attoh et al., 2019); it also does so in a way that orients their disposition and self-motivation as labour-commodities whose use value can be calculated and pitched one against another (Van Doorn, 2020).

 Yet, this is not to say that workers do not try to overturn the terms of their exploitation when they realise it, and that there are forms of what Woodcock and Johnson (2018) have identified in the radical potential of gamification ‘from below’. While we highlight that automation is not static but actively reconfigures itself to appeal to human logics and wants, it is also locked in a never-ending race to address discontents and slippages that may arise occasionally. To return to Wells et al.’s (2021) case of Uber drivers at Reagan Airport, alternative geographies can unexpectedly erupt to produce capacities for solidarities among distanciated workers. As they elaborate, the combination of a dedicated ride-sharing airport parking lot, sandwiched between two highways, and the use of geofencing technologies, meant that drivers could comfortably queue and socialise in a fixed place. This had the unintended effect of breaking algorithmic habits, building community, enabling the organisation of industrial action, as well as the development of  strategies that could ‘game’ the platform’s dynamic pricing system ‘from-below’ to achieve better prices.

Similar attempts at subverting this isolation can be observed in contexts outside the Global North. Pollio’s (2021: 51) recent paper on Uber as ground transportation again shows how e-hailing work in ‘messy’ airports like Mumbai and Cape Town cannot subsist without first embedding the technology within already-existing informalised practices of labour and capital which depart the imagined monetary practices of the app. Pollio (2021: 52) argues that platform economies must thus be seen as simultaneously embedded and disembedded within the local vernacular of socio-economic relations, and that ‘these economies happen in defiance of the strict regulations of software-enabled transactions.’ As much as platform technologies have the power to shape labour dispositions in many cases, they are also open to interpretation, with play scripts that are malleable, rather than set in stone.

*Acquiescence*

Automation can also instigate a more subdued kind of disposition, characterised by a state of acquiescence and perhaps numbness. This more insidious way of inducing consent thrives on long periods of technological exposure and normalisation, thus allowing resistance to ebb. Yet, while acquiescence has long been studied vis-à-vis human personality traits in psychology (Messick, 1966), the term—as a signifier for various forms of weak or passive agreement—has rarely been analysed in a sustained manner in geography. Often used literally, if not in passing, to denote a sense of resignation or reluctant acceptance, acquiescence is typically seen as yielding to known injustices without any effort to put up a struggle. Because it is synonymous with a tacit notion of surrendering to domination, acquiescence is also often criticised by geographers, in relations to such issues as resource conflicts, housing policy, land grabbing and social movements (Skinner et al., 2013; Steinberg and Clark, 1999; Troy, 2000).

Acquiescence, however, needs to be understood in more analytical ways, including how it is exercised and actualised in non-linear ways. To be sure, senses of acquiescence have rarely been applied to automation, but a few studies on mechanic and robotic technologies can shed light on how cooperation may be elicited through a slow creep of familiarity. For Bui (2020: 111), a particularly important part of the conversation on mechanised labour pertains to ‘the social meanings surrounding Asian roboticism, or how Asians have [historically] been rendered as “robotic” subjects and labor.’ Sensitive to such racial and gendered dimensions, he argues that stereotypical assumptions of ‘Asian roboticism’ could ‘affect the ways such subjects are rendered as exploitable, alienated robots without human rights or subjectivity’ (Bui, 2020: 111), where the human-turned-robot themselves becomes acquiescent to increasingly automated futures. In a reversal of this thesis, Mackintosh and Norcliffe (2007) illustrate, elsewhere, how the bicycle had in Victorian times been key to sensitising female public presence through the everyday use of the technology. As they elaborate, ‘[w]omen’s adoption of cycling in the 1890s represented not the continuity of a craze so much as a fundamental change and reversal of accepted norms’, as this mode of transport led to an ‘acquiescence of the public’ towards female mobile life (Mackintosh and Norcliffe, 2007: 18). Both these insights point to the potential ways in which automation might similarly, and inconsistently, change social attitudes through exposure. If unintentionally, the daily lull of technology could produce acquiescence as a dispositional response.

Airport automation, indeed, bears traces of these acquiescent tendencies, both from the perspective of passengers and of labour. For the former, research has shown how passengers are not merely subjects of micro-management at airports, but also, themselves, subconsciously yield to the encroachment of automation upon their mobilities. A recent study by Nguyen and John (2017) on passengers’ perceptions of computer-based screening procedures at security checkpoints post-9/11 finds that respondents were, over time, largely ‘indifferent’ to whether humans or machines made the risk assessment of their liability for pat-downs. Although travellers preferred a ‘conventional’ screening process under which all passengers underwent the same manual checks, their acquiescence to computerised, risk-based techniques of differentiation ‘may be due to the fact that power may have been limited’ (Nguyen and John, 2017: 36). As Pütz (2012: 170) puts it, ‘a programmed algorithm decide[s] which travelers need to be touched’, allowing ‘screeners to step back, reduce personal involvement, and simply react to the alarm’. Without a human subject to contend with, passengers are gradually conditioned to adopt an aquiescent disposition, not necessarily by choice, but by resignation to automatic sorting and a habitual lack of recourse.

Other literature has given more attention to the way acquiescence shows up as a learnt posture to the tedium of work, typically in the form of complacency or dulled senses. On airport security again, Davis et al. (2020) interrogate how baggage screeners may be prone to exhibiting traits of ‘automation bias’ over time, as they overly depend on machines to make decisions for them. In a similar vein, but turning the gaze to the air, Eastwood et al. (2012) underscore the propensity for pilots to develop a sense of boredom when engaging automatic flight, as the mind switches off and relinquishes control to aircraft avionics. While these are longstanding issues in the industry, such instances illustrate not just the risk of deskilling in labour by workers’ own complicity, but also how human-machine interactions do not always lead to overt conflict or a recalibration of relations in favour of labour (see Bellanova and Glouftsios, 2022). Instead, an alternative outcome could be a silent yielding to—or even blind faith in—automation. With the advent of digital and algorithmic airport processes, acquiescence as a behavioural response could encourage a further erosion of the human will to reclaim sovereignty, and a disposition that relinquishes ever-increasing power to automation’s ‘deep learning’ (Amoore, 2021).

**Conclusions**

This paper has sought to extend recent geographical debates on the rise of automation and its associated implications for human-machine relations. Neither approaching automation as an unstoppable force poised to displace labour, nor treating it as a static infrastructure its users slowly chisel away at to subdue it, the paper has endeavoured to highlight a variety of influential dispositions that can develop alongside—and ease—the use of technology. An attunement to these in-process dispositions acknowledges the complex engagements between humans and machines, and highlights the subtle ways in which modern technological set-ups are increasingly geared towards capturing buy-ins or even stoking user enthusiasm by design. Through examples drawn from aviation, the paper has considered five such dispositional generations, namely enchantment, aspiration, experimentation, gamification, and acquiescence. Not meant to be exhaustive, these tropes offer some preliminary ideas on how certain tendencies are built into today’s automation to lubricate its adoption and, in some instances, to denigrate labour.

Understanding automation alongside these manifold dispositions benefits geographical knowledge on the subject in two ways. First, it underscores the ineluctable tension between structure and practice in any automative situation, such that the adoption and acceptance of a technology does not necessarily equate to agreement. Indeed, it is not inconceivable for people to be inclined to collude—sometimes at their own expense—with machines in the name of upholding hopes and aspirations (of progress, modernity, development etc.), potentially driving the proliferation of dominant automation. Seen thus, human-machine relations do not happen in a vacuum, but must have their executions contextualised within longer trails of history, events, experimentations and social resonances (Connolly, 2005). Such entanglements add new intricacies to the politics of labour, for it becomes harder to decipher achievement of ideals such as ‘technological sovereignty’ (Lynch, 2020a, 2020b), when people’s (dis)affinities with machines are often already clouded by anticipatory ideologies and governmentalities built into automation by its creators. By recognising the potential for such (mis)adherences and cruel optimisms (Berlant, 2011), the paper cautions against reading bottom-up (re)appropriations of automation as necessarily lying beyond the bounds of technological control.

Conversely, and as a second contribution, the paper has not neglected the creative dialogues humans and machines can initiate with one another. This does not just entail the former seeking to change automation from the outside (although this has certainly happened), but can also involve machines gradually acquiring agency, by design, to interpellate and encourage users to respond to them. In this context, it is no coincidence that automation today typically comprises technologies that emphasise interactivity, personalisation, and lively appeal (Ash, 2015; Sumartojo and Lugli, 2021), enthusing and inducing workers and customers alike to keep returning to them. This trend alerts one to the emergence of an affective kind of automation that does not only do the heavy-lifting tasks of mechanising or self-piloting tedious processes, but also does the ‘softer’ work of captivating its audience through sensual means (Ash, 2010). When applied to labour, the harnessing of particular affective susceptibilities to promote certain work ethics and efficiencies has the potential to become exploitative and manipulative. In particular, the characterisation of some machines as dispensers of care is especially prone to entrenching certain social roles—e.g. gendered and racialised labour—in ways that deepen their marginalisation, than emancipate them (Jackman and Brickell, 2021).

Notwithstanding, this ‘soft’ sculpturing of modern automation simultaneously provides a loophole for labour to fight back. By being constantly engaged and tethered to people’s choices and urges, automation must create space for the exercise of free will, thus inevitably allowing some opportunities for users to outsmart its technologies and algorithms, and, as it were, to ‘play the game’ (Richardson and Bissell, 2019). Several scholars have already shown the potential of such subversions (Attoh et al., 2019; Wells et al., 2021), but this article also cautions against too hastily celebrating labour’s one-time triumph, seeing that machine designers are always in search of new ways, and persuasive dispositions, to close these gaps (Schüll, 2012). By keeping in sight the agility of capital’s response, it becomes possible to appreciate the dialogic and iterative ways by which humans and machines negotiate with one another—not always towards a stabilising outcome, but one that is interstitially tussled between multiple intelligences, affective desires, and conscious beliefs (Hayles, 2017).

This paper hopes to have fostered a more conscientious sense of the diverse dispositions which incline societies to uneven adoptions of automation. Straddling a wide spectrum of leanings, inclinations and tendencies, the discussion has found such dispositions—in all their contradictory cultural, ideological, practical, performative, and affective intricacies—to be useful starting points for examining how human-technology assemblages are contextually formed, reformed, and resisted. Although the paper has predominantly focused on examples from aviation, many of its lessons can be extended to automation in other situations—from the city to the shipyard to even the home—where similar (and very likely other) dispositions are trained, activated, accumulated and inter-referentially passed on for myriad capitalistic exploits. Paying attention to these framings can help identify automation better as foremost *cultural*—and not just technical—form(ul)ations that are deeply intertwined with specific societal expectations, ambitions and strategies unfolding and generated across space and time. Without appreciating these practical enmeshments, the true nature of human-machine relations may never be adequately decoded in their place.

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