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Algorithmic Governance and Postcoloniality

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ABSTRACT

The concept of algorithmic governance is increasingly being used to make sense of rapid technological transformations of governance practices globally. This paper outlines three key dynamics that underpin the dominant literature on algorithmic governance, that is social ordering through digital veillance, reduced negotiability via roboprocesses, and dependency-led compliance. Analyzing Kerala's experiment with AI traffic cameras along these three dynamics, this paper advocates that algorithmic governance is better understood when grounded in sociopolitical contexts. To do so, I demonstrate how bringing algorithmic governance in conversation with postcoloniality allows us to effectively analyze the introduction of new hierarchies and understand the emerging Human Computer Collaboration systems better, especially in postcolonial contexts.

1 | Introduction

The Government of Kerala in India in 2023 installed 726 AI enabled cameras across the state to automatically monitor traffic violations and issue fines. With the stated capacity to issue 30,000 challans a day (Economic Times 2023), the system was designed to seek public compliance with traffic rules, while increasing state revenue. Within a year of its implementation, the state has claimed an increase in revenue, along with a reduction in traffic rule violation and fatalities (The Hindu Bureau 2023; Kallungal 2024).

The AI cameras are trained to automatically detect traffic violations like people not wearing seat belts or helmets while driving. Underlying this story of algorithmic transformation is the belief that automation leads to efficiency. A belief that is common in algorithmic governance but requires a more thorough investigation.

Kerala has a history of governance driving an anti-imperial and anti-colonial governance strategy underpinning the Kerala model of development. In this paper, I will note how in its experiment with algorithmic governance, new dilemmas emerge as a communist government attempts to adapt technological mechanisms spearheaded by neoliberal states. I will show how this new mechanism introduces a hierarchy of masters and servants by *relocating* the discretionary individual in this newly evolving system of Human Computer Collaborations (HCC). I will contextualize this development in the context of dominant tendencies in algorithmic governance, and outline the need for a more robust contextual analysis of evolving HCCs outlining how algorithmic governance may be better understood in its plurality, by bringing it in conversation with frameworks of postcoloniality (Young 2009; Radhakrishnan 1993).

For this paper I began by reviewing the dominant literature on algorithmic governance and outlined three key tendencies being documented in the literature, that is social ordering through digital veillance, reduced negotiability via roboprocesses, and dependency-led compliance. These three tendencies were then analyzed by engaging with key debates in critical AI studies, surveillance studies, digital sociology, science and technology studies, and political economy of technology on digital veillance, roboprocesses and dependency (Section 2). Having analyzed

these tendencies, I used the exemplary case of Kerala's experiment with AI traffic cameras, to understand how these tendencies apply to the context of Kerala, and noted that while they are evident in the Kerala experiment, they do not sufficiently explain the emerging dilemmas (Section 3). Having identified these dilemmas I revisited algorithmic governance debates by bringing them in conversation with the framework of postcoloniality, thereby proposing that to accurately analyze the emerging dilemmas we must view algorithmic governance through the lens of postcoloniality, which allows us to unpack emerging dynamics in postcolonial contexts better (Section 4). Having identified this framework, I revisited the exemplary case of AI traffic cameras to unpack machinic assemblages and analyze emergent new hierarchies (Section 5).

2 | Algorithmic Governance

The discourse on algorithmic governance has been gaining traction over the last few years, with deliberations aplenty on its meaning, genesis, and implications. It could generally be argued that critical social science perspective on algorithmic governance prioritize the sociotechnical approach to understanding algorithms, as opposed to the abstract technical view alone. In this strain, Katzenbach and Ulbricht (2019) define algorithmic governance as "a form of social ordering that relies on coordination between actors, is based on rules and incorporates particularly complex computer based epistemic procedures." (2). Critical literature on algorithmic governance scrutinizes the ways in which algorithms create social order. Computer based epistemic procedures incorporate digital veillance as a fundamental component of perceiving society, whereas roboprocesses mediate the coordination between social actors, producing new forms of dependency-led compliance.

In this section, I will review dominant discussions on algorithmic governance and outline three key dynamics conditioning the development of algorithmic governance that is social ordering through digital veillance, reduced negotiability via roboprocesses, and dependency-led compliance.

2.1 | Social Ordering and Digital Veillance

The range of literature that exists today begins with a primer on what algorithms mean, and how they define algorithms, leading to a multiplicity of definitions. Seaver (2017) in response to the terminological anxiety about what algorithms really mean, proposes viewing algorithms as "multiples", engaging with its multiple definitions and effectively treating them as diffuse and heterogenous sociotechnical systems. Building on this proposal of not grounding discussions of algorithmic systems on dominant computer science definitions, Issar and Aneesh (2021) in their review of literature on algorithmic governance propose treating computer science and social science as two separate horizons of observation, wherein "technical efficiency" and "social negotiability" respectively emerge as the disciplinary foci. Going further back into a social history of algorithms, Pasquinelli (2023) traces practices of ritualistic fire building to primordial algorithmic cultures tracing back to 800 BCE India. Through this he notes that while in the contemporary debates on algorithms, germinating in modern western scientific thinking, algorithms are usually understood as the application of set of rules in the abstract, in reality, "algorithms have their genesis in social and material activities." (16), in other words, algorithmic thinking has historically conditioned labor relations and social development. He also notes that the prioritizing of abstract knowledge of artificial metalanguages belonging to the modern industrial west represents a form of "epistemic colonialism" (16) that significantly conditions our understanding of algorithms today and how they contribute to social ordering.

Operationalizing this new form of social ordering however are more elusive infrastructures of surveillance. To effectively understand contemporary algorithmic governance and its associated surveillance infrastructures, we must take a step back and interrogate modernity itself, which Bauman and Lyon (2013) note has liquefied. Aligned with Bauman's notion of liquid modernity—where social structures melt quickly and change shape more quickly—is the notion of liquid surveillance, comprising of post-panoptic infrastructures of "personal panopticons" that are more capable of surveilling liquid modernity. "Liquid surveillance", Bauman and Lyon (2013) outline, "is less a complete way of specifying surveillance and more an orientation, a way of situating surveillance developments in the fluid and unsettling modernity of today" (2). Owing to its liquid and ever-changing structure, liquid surveillance as an infrastructure is more difficult to outline. The multiple ways of seeing in digital society or digital veillance, however provide an insight into how surveillance itself has liquefied. For instance (a) banoptic or use of data to ban or exclude, (b) panspectric/dataveillance or digital tech and use of data, (c) sousveillance, synoptic or many watching the few, like citizens surveilling those in authority, (d) participatory veillance, like consenting to data collection as a precondition to access (ex. Social media sites) etc.[1] are all forms of veillance or seeing that are operationalized through new infrastructures that are "post-panoptic" yet produce similar effect of discipline induced social ordering. The first key dynamic that emerges for algorithmic governance thus is that of social ordering through digital veillance infrastructures of liquid modernity.

2.2 | Reduced Negotiability via Roboprocesses

New modes of social ordering, premised on liquid surveillance produce renewed challenges for social systems and burgeoning human computer interactions. Issar and Aneesh (2021) through their review of literature on algorithmic governance outline that in the contemporary era renewed challenges emerge when social processes that were so far deemed important for deliberation and contestation, "are moved to a space of *reduced negotiability* [emphasis added] through algorithmic governance, pre-determining the range of possible events with programed alternatives" (4). In other words, the authors argue that algorithmic governance through its mechanisms of automated decision making relegates the zone of contestations and deliberations on decision making behind a black box, effectively reducing the scope for negotiability. Pasquale (2015) has authoritatively shown how black-boxed systems not only produce challenges to accountability, transparency and intelligibility in governance practices, but also, and even more concerningly, produce more centralization of decision-making authorities. This tendency, we may note is inherently antidemocratic and is premised on reduced negotiability.

These tendencies however are not new. Weber (1948) in his classic essay on bureaucracy observed, "that 'democracy' as such is opposed to the 'rule' of bureaucracy" (231). Through algorithmic governance, we note that these tendencies get further amplified, often through what Besteman and Gusterson (2019) call roboprocesses, wherein "the common sense and situational logic of humans is displaced by and subordinated to the logic of automation and bureaucracy" (2). Besteman and Gusterson (2019) notes that roboprocesses are deeply rooted in bureaucratic codes of rationality and discipline. Algorithmic governance therefore may not be seen as radically new systems producing hitherto non-existent social and political processes. It is important to locate algorithmic governance today in *tendencies* that have long been a part of governance frameworks, such as bureaucratization, rationality, and discipline. This is not to say that there is nothing new in algorithmic governance. While algorithmic ordering of social systems may be traced to pre-existing tendencies, the scale at which these systems are being deployed in governance today is new and unprecedented. Underlying this scaling are processes of quantification and automation as fundamental components of roboprocesses that significantly reduces negotiability. This relationship, between algorithmic governance and reduced negotiability via roboprocesses, we may note is the second tendency underpinning the development of algorithmic governance today.

2.3 | Compliance and Dependency

Often the adverse consequences of such unprecedented scaling up are treated as glitches which are deemed to be temporary errors that will eventually be resolved. For instance, the technical efficiency focus in algorithmic governance treats racial bias as a glitch and attributes it to the problems with data that is fed into the algorithmic system. Benjamin (2019) uses glitch as a conceptual framework and prompts us to probe the relationship between glitches and design features. This is most evident in algorithmic governance in policing systems. Reports of racial bias in predictive policing systems are plenty. Here using Benjamin's framework, we may ask whether racist output in predictive policing is a glitch or a design feature, especially considering how the use of prediction tools premised on previous data in policing is not new. Benjamin argues that algorithms are biased not only because the system is flawed, but more importantly because society is racist. Algorithmic systems that mimic social behavior thus emulate these dominant biases as well. These social biases are replicated and amplified in algorithmic systems, which the sociotechnical lens to algorithmic governance is able to unpack effectively. Brayne's (2021) study of the Los Angeles Police Department and its use of predictive policing systems outlines this clearly. Brayne (2021) notes that while the use of data in law enforcement is not new, the role of private actors in public policing is. The new dynamics emerging in algorithmic policing specifically and more generally in algorithmic governance is the adoption of tools developed in military contexts designed by private companies for public services. In the Neoliberal turn, Brayne (2021) outlines, we see the entry of private companies in once exclusively public endeavors like policing and social welfare. Often the move toward privatization in public services is justified by the notion that privatization brings with it efficiency in public service. On the contrary however, Brayne (2021) outlines that in the case of algorithmic policing, "law enforcement adopted big data analytics not because there was empirical evidence that it *actually* improved efficiency, but because there was immense institutional pressure to conform as other institutions began marshalling big data and algorithmic predictions for decision-making" (23). The overarching factors that seem to be leading to adoption of algorithmic infrastructures, under the guise of efficiency, therefore are structures of compliance.

These systems of compliance are built on what Schildt (2020) calls the data imperative, or "a worldview where customers, employees, services, and the various business processes connecting them are cast as elements of a system to be first represented digitally and then optimized, reinvented, and automated" (41). The data imperative drives the unprecedented scale at which algorithmic systems are adopted in public infrastructure. While it is often presented as processes of efficiency and optimization, fundamentally the idea of data imperative assumes that the current system, anywhere, is inefficient and can be optimized through automation. Therefore, Schildt (2020) notes that the true "potential" of algorithms can only be obtained by moving from human interventions to smart automation. Smart automation is pitched not only as necessary for efficiency, but also rhetorically to weed out corruption and error.

Effectively the data imperative operationalized by new structures of compliance produces what Kuldova (2022) calls "the Compliance-Industrial Complex" where "workers, clients, suppliers, customers and others, [are turned] into suspects, possible threats and risks to be continually monitored, surveilled, and managed" (115) Aligning with the assumption of inefficiency of current systems is the assumption that bias, error, mistakes, and more importantly corruption and cheating is produced in public services by human participants, which can be bypassed through automation. Effectively thus, Kuldova (2022) notes that a "zero-trust environment" is being created, which mandates an environment of suspicion and control as well as ever-proliferating "threats" both internal and external that are to be constantly assessed and monitored in real-time and managed through an ever-expanding regulatory landscape. This expanding regulatory landscape is often not built or developed organically or indigenously. These systems are developed usually by private companies for public services creating a dynamic of compliance and dependency that traverses geopolitical dimensions, also leading to conceptualisations like "data colonialism".[2] Today algorithmic governance is most visibly apparent in the transformation of state practices through e-governance mechanisms especially in local self-government, police, and various departments like statistics, revenue, and so on. These new transformations are conditioned by what Dos Santos notes to be technological-industrial mode of dependency creating a relationship of subordination wherein dependent nations face obstacles in the acquisition and development of technologies (See Dos Santos in Valente and Grohmann 2024). Dependency led compliance thus form the third key dynamic underpinning the development of algorithmic governance.

In this section 1 have shown how social ordering through digital veillance, reduced negotiability via roboprocesses, and

dependency-led compliance form the three key dynamics of algorithmic governance. A common assumption that emerges from these underlying dynamics is that systems that undo these dynamics might offer "better" alternatives *of* algorithmic governance. A crucial flaw in these assumptions is that the above mentioned dynamics are assumed to materialize universally in the same way as they have been described in the dominant literature. These studies however have emerged from the minority world, or a small cluster of countries whose decisions disproportionately affect the majority of the world's population (Alam 2008). While the dynamics themselves may be more abstract and applicable globally, they materialize differently in the majority world, or regions representing the majority of the world's population also known as the "third world" (Alam 2008), especially in postcolonial contexts. In the next section, I will interrogate these dynamics by drawing from an example of algorithmic governance in a postcolonial state in the global south (Kerala, India) and point toward gaps in our understanding of algorithmic governance that a postcolonial lens can fulfill.

3 | Kerala's Experiment: Automated Traffic Monitoring and Indigenous Tech

The state of Kerala, in southwest India is part of a quasi-federal framework of India with a history of an alternative development trajectory also known as the Kerala model of development. Building on an anti-colonialist and anti-imperialist legacy, Kerala developed a novel approach to governance that prioritizes human development over unrestrained economic growth. With primary focus on improving human development indicators through consistently high social sector spending on sectors like primary health, education, food and so on, rather than unmitigated growth (Franke and Chasin 1992; Patnaik 1995; Heller 1999; Varghese 2021). Despite being a small state in terms of resources, this system of governance has achieved high human development indicators and low levels of poverty (Ramachandran 1997). The commitment to human development has become a fundamental basis of governance in Kerala, honored by the two key political coalitions (the Left Democratic Front or LDF, and the United Democratic Front or UDF) that have historically governed the state. This model is fundamentally built on radical redistribution of available resources In the 1970 and 80s however the model encountered several constraints in transforming human development to economic development leading to questions on the sustainability of the model (Parayil 1996). Growth slowly picked up in the 1990s, crucially driven by the construction and service sector, as opposed to manufacturing and agriculture (Kannan 2023). Governance efforts since then have been geared toward continuing state investment in human development to power economic growth through the service sector. Having achieved high human development has now led to new aspirations for better employment opportunities and demands for better services from the State. This has led to the emerging dilemmas in the state, of the need to secure economic growth, while retaining investments in human development. The State's current interest in AI can also be seen in this light., where the State hopes to generate employment and provide better governance services by investing in AI. In 2021 the state embarked on a process of digital overhaul of the governance mechanism under its e-governance policy. Under this policy the state is integrating ICT, big data, and AI technologies in essential state services like education, health, security, revenue and so on for "better governance" (Administrative Reforms Commission 2021). A key feature of the e-governance policy is its emphasis on finding alternative routes to technology development, to reduce dependency on "external agencies" for the envisioned digital overhaul of the state.

Building on this, the state has incorporated several initiatives, such as installation of close to 700 AI cameras to monitor traffic violations, AI-enabled Facial Recognition software indigenously developed by the Kerala Police, unveiling of an indigenously developed drone surveillance program, digitalization of Local Self Government Departments in the state, and so on. This paper takes a close look at one such development that is, the AI-enabled traffic cameras that "automatically" process traffic violations. I draw from research documenting the development of algorithmic governance in Kerala since 2022, and specifically the AI traffic camera project since its implementation in 2023, through an analysis of press releases, news reports, debates in the legislative assembly, and political controversies. In March 2025, during fieldwork in Kerala, I interacted with two officials Nigesh and Subin[3] from KELTRON at a Motor Vehicle Department (MVD) Command Center in Kerala, where they were monitoring the implementation of the AI traffic cameras. Nigesh was the overall supervisor of the project, and Subin a computer engineer assisting with the designing and maintenance of the system. Before we venture into the mechanism of the AI traffic camera monitoring system, it is important to take a short detour and outline the evolution of the project.

3.1 | A Brief History of the AI Traffic Camera Project

Implemented under the aegis of the Motor Vehicle Department (MVD), and aligning with the E-Governance policy's emphasis on reducing dependency on "external agencies", the AI traffic cameras were developed by KELTRON, a Kerala based Public Sector Undertaking (PSU) owned by the Government of Kerala. KELTRON had been assisting the State in providing smart school services in terms of IT infrastructure for the past few years. At the behest of the Motor Vehicle Department in Kerala, in 2008 the company conducted research on road safety. Through this research, Nigesh claimed, they found that unlike the commonly believed reason of over speeding only, most road accidents and fatalities were caused by reasons like people not wearing helmets and seat belts while driving, bad road designs and bad quality roads in addition to over speeding.

The State wanted a technological solution for the problem of road accidents and fatalities and therefore unveiled the Safe Kerala Project (SKP) in 2019 with the aim of reducing road accidents and checking traffic violations. Early initiatives under this project included importing speed guns to monitor over speeding. Nigesh explained that the State encountered a problem in this because the department was dependent on external companies for the delivery and repair of said technology. He noted that, "even to replace batteries the department had become dependent". In this context, KELTRON as a Kerala-based PSU was approached for an indigenous tech solution.

The company therefore first experimented by developing sensors to detect over speeding. This however did not lead to the desired outcome of reduction in road accidents, as not enough personnel were available to manually monitor traffic 24 × 7.

Eventually the Kerala Road Safety Authority wanted to automate this system, indicating the data imperative. This led to the development of the AI-enabled traffic violation monitoring system by KELTRON. Nigesh noted that this corresponded with the emergence of NVIDIA chips as a viable option. Making use of NVIDIA chips they developed the technology, which included the cameras and a supervised AI model, in-house and trained the model on data that they had been collecting specifically for this project since 2020. After close to three years of training and optimization, the fully automated traffic enforcement system was finally implemented in 2023 across the State. The availability of NVIDIA chips and the desire to bypass dependency on external agencies provides evidence of a key dilemma in the third dynamic of compliance and dependency outlined above specifically on how it unfolds in postcolonial algorithmic governance. I will expand on this further in the following section 4 and 5. Before that, it is necessary to delve further into the mechanism of the AI traffic cameras themselves.

3.2 | The Mechanism of AI Traffic Cameras

During my interaction with Nigesh and Subin, I enquired about the mechanism of the automated traffic violations monitoring system and Subin explained that the cameras, contrary to popular belief, were not Closed-Circuit Tele Vision (CCTV) cameras but were rather still cameras, like Single Lense Reflex (SLR) cameras. These cameras were solar powered and were "enabled" by AI to capture images of traffic violations *only* after detecting a violation, based on the images it has been trained on. This image was then transmitted to a monitoring system in district Control Rooms. This way the image is captured and stored on site and communicated to the control room, where the image is processed by the control room staff, who at the time of writing of this paper were KELTRON employees but were in the process of being phased out to be completely handled by the MVD. Images once processed by the KELTRON employees would then be reported to the local police or the MVD control room where a police officer, as a final overseeing authority, would be able to bulk approve reported cases for the processing of fines. They explained that the final overseeing authority was a police officer in the department, who approved the cases of traffic violation. This overall mechanism represents what Pasquinelli (2023) calls machinic assemblages. In this particular context, the machinic assemblage outlines a socio-technical relation where the AI camera forms only the front end of the automated traffic violation monitoring system. This machinic assemblage is also built on an infrastructure of digital veillance and roboprocesses that operationalize automation. I will delve further into the implications of this assemblage in section 4 and 5.

Following this, I enquired about how this new system was better than the way things were done earlier. Nigesh argued that keeping the vehicle density of the state in mind, it is impossible to monitor traffic manually, because it would be impossible to deploy personnel at that scale. Moving toward an automated monitoring system, he noted, was imperative, hinting again at the data imperative. Moreover, he noted :

> through manual monitoring a traffic cop may at the most detect 50 violations in an entire shift [which normally lasts eight hours]. In comparison, one camera can check 2,000 vehicles in an hour in which 500 may be violations. All those 500 violations in turn can be approved in one shift by one officer. This system increases the overall efficiency.
>
> [in paraphrase]

Underlying this narrative is the perceived superiority of automated systems over analog systems and the notion that automation and roboprocesses lead to efficiency.

During our discussion I further enquired about how the current system fared against (1) common concerns over surveillance and privacy violation, (2) issues of data security and dependency and (3) concerns over the creation of opaque, unaccountable systems devoid of human agency producing reduced scope of negotiability. Nigesh argued that this system countered all three concerns. He noted that since the system does not rely on indiscriminate CCTV surveillance and only captures a still image when the system detects a traffic violation, it does not amount to privacy violations. Moreover, he noted that it only covers traffic junctions and does not intrude into personal spaces. Regarding concerns over data security and dependency, he noted that data was stored locally in state infrastructure and communicated through a highly secure protocol. Since there is no transfer of data to any external agency, Nigesh noted, the current model also reduced dependency. These arguments were echoed by the High Court of Kerala as well in 2025 while dismissing a Public Interest Litigation (PIL) filed by the leader of opposition in the State alleging privacy violation, and data security concerns (PTI 2025) in relation to the AI traffic cameras. Finally with respect to human agency, he noted that the since the current model incorporates a review mechanism by placing police personnel as the final approving authority, the overall system does not become opaque and unaccountable and functions by retaining human agency, countering concerns over reduced negotiability.

In this section 1 have shown how the three key dynamics of algorithmic governance that is social ordering through digital veillance, reduced negotiability via roboprocesses, and dependency-led compliance, emerge in Kerala's experiment with AI systems. While these dynamics may be evident, they do not fully explain new dilemmas emerging from the Kerala experiment. To fully understand Kerala's experiment, we must bring algorithmic governance in conversation with postcoloniality.

4 | Postcoloniality and Algorithmic Governance

To effectively understand what Kerala's experiment offers to our understanding of algorithmic governance, I draw upon the lens of postcoloniality to nuance our analysis. Postcoloniality is

broadly defined as the "situations and problems that have followed decolonization—whether in the formerly colonizing or colonized country" (Young 2009, 13)—One persistent problem in the postcolonial context has been that of dependency. Noting that the articulation of the term "postcoloniality" developed simultaneously to cultural theory, Radhakrishnan (1993) argues for a need to unpack how postcoloniality as an allegory responds to postcoloniality as a historical phenomenon, by drawing from historical and empirical criteria, and distinguishing between politically relevant and necessary acts of transcendence, and mere gestures of transcendence. In this context, I argue that Kerala's experiment with indigenous tech development is politically relevant and necessary act of transcendence to dominant dependency concerns, and not merely gestures of transcendence, albeit with its own limitations. However, it is important to not overstate the claim. Bringing the literature on postcoloniality and algorithmic governance in conversation, Abraham and Rajadhyaksha (2015) point out that familiar configurations of governmentality as dominant in Western experience do not hold in non-western experiences. Postcolonial technological societies are significantly conditioned by experiences of colonialism, where in the reimagination of history by postcolonial states, technological backwardness is constructed as the reason for colonization. Therefore, technology in the postcolonial context is often perceived as the necessary path toward modernization, which is imperative for the undoing of the "humiliations of colonialism" (67). In this context, Abraham and Rajadhyaksha (2015) note that "differentiating between the Asian and Western contexts involves the necessity of seeing (1) how and which modes of state power typically work in conjunction with each other...and (2) acknowledging the importance of social power, namely, the long histories of private efforts ("social reformers") in disciplining the native body...The historical specificities of the Asian experience reshapes what we mean by biopower, offering novel combinations of state power as well as requiring, in addition, consideration of the power of civil society and private agents." (73). In other words, we must take into account the power dynamics in postcolonial contexts to effectively unpack how technological solutions become constructed as postcolonial anti-colonial projects. This is even more true in the context of Kerala, where the history of left government has led to an alternate development trajectory.

Mannathukkaren (2010) further argues that when analyzing postcolonial developments, the state must be documented and studied historically and not essentially. Referring to the ways in which local politics has been defined by the collusion of the local political class, civil servants, contractors, engineers and so on play, the author argues that in the context of Kerala elements of the state, civil society, and political society have historically developed a nexus that has been instrumental in perpetrating class rule in the state. With respect to algorithmic systems in state services, however, Brayne (2021) has documented the dominance of private technology companies and the state forming a nexus particularly in the development of predictive policing systems. This has been the dominant model of development of technology for the state in many countries and has primarily conditioned the dependency led compliance dynamic outlined in section 2. In contrast, Kerala's e-governance policy, and specifically the AI traffic camera system, aligns with the Kerala model of development, where it relies on the creation of infrastructures that are not dependent on despotic forms of capitalism and privatization. Herein lies its anti-colonial postcolonial potential. This alternative however is not devoid of its own challenges. Despite a potential alternative to the dominant private technology and state nexus, there appears to be an inevitable integration of external technology experts in the mechanism of the state, even when the private technology and state nexus as noted by Brayne (2021) is bypassed.

I argue that the desire to evade dependency on external agency may be seen as a postcolonial desire, because it emerges from the anti-colonial and anti-imperial legacy underpinning the Kerala model of development, and the communist government's vision of the state. Here it is anticolonial in a postcolonial context not because of its geographical location in the global south. As Go (2023) notes "The space of the anticolonial does not mark an essential position of geography (or race, for that matter) but a relational position of experience, of subordination, erasure and struggle" (291). Other states in India do not express the same desire. Therefore, I draw from Valluvan and Kapoor (2023) who note that "the anticolonial need[s] to be envisaged within nation-states" (315) as well. Kerala's experiment in this postcolonial context represents an anticolonial desire because it aligns with what Valluvan and Kapoor (2023) identify to be the basis of anticolonial thought. They note that "the best of anticolonial thought is committed to a redemptive modernity that can live out its promise of radical freedom and absolute equality" (Valluvan and Kapoor 2023, 316). I argue that Kerala's experiment is representative of this anticolonial desire because it envisions a redemptive modernity, where the state is sovereign in tech development, and more importantly not dependant on "external agencies". The model attempts to reverse the pitfalls of data colonialism (Mejias and Couldry 2024) and central to these processes in data colonialism is the issue of dependency.

This however is not to say that the Kerala experiment is a perfect example of alternative tech development. It unfurls various dilemmas that need to be studied in more detail. I will outline some of these dilemmas in section 5. In its current form the Kerala experiment represents, at best, a mid-level anticolonial move, ensconced in a broadly neocolonial architecture. Mid-level because Kerala does not have the federal autonomy or resources to achieve complete indigenization of tech development, and so in its limited capacity to evade dependency on external agencies it represents a mid-level anticolonial move. This however is ensconced in a larger neocolonial framework indicative of data colonialism, as it continues to operationalize the dynamics of social ordering through digital veillance, and reduced negotiability via roboprocesses. Similar hierarchies of tech supremacy and human limitations are creeping in, as is evident from Nigesh's observations above, that are driving automation. So are the tendencies to strive for automation that is premised on safety and security—like reduction of fatalities and road accidents—but borders on surveillance. Common concerns that have emerged in the state with regard to the automated traffic violation monitoring system is that of privacy violation and data security, as is evident in the PIL that was filed by the leader of opposition in the State (Raghunath 2023).

These dilemmas are subject to active political deliberations and discourses. Their resolution would also depend on the directions the State takes in its future endeavors. However, underlying these deliberations we are also able to see the introduction of new hierarchies. We see in this development of algorithmic governance in Kerala an integration of technology experts and service providers like KELTRON being deemed necessary in the indigenously developing Human Computer Collaborations. We may be able to better understand these developments by taking recourse to the multiplicity of algorithms and algorithmic governance as discussed by Seaver (2017) and Katzenbach and Ulbricht (2019) which also allows us to account for the multiplicity of forms of social ordering, and therefore allows us to document how Kerala's experiment while being similar may yet be distinct. To accurately unpack these new dilemmas, I argue that approaching algorithmic governance from a postcolonial lens offers us the frameworks to document the new hierarchies in emerging algorithmic systems. I expand on this further in the subsequent section.

5 | Machinic Assemblage and New Hierarchies

New and evolving Human Computer Collaborations (HCCs) like the automated traffic violation monitoring system also change the nature of negotiability not only reducing citizen's ability to challenge state decisions but also the state personnel's decision-making capacities by introduce new hierarchies. Pasquinelli (2023) drawing from Deleuze and Guattari stresses on the need to visualize machinic assemblages when looking at algorithmic systems. In the context of the AI traffic cameras in Kerala, this assemblage constitutes of not only the AI cameras and their technical mechanisms, but the hierarchical ordering of the AI Camera at the bottom, the KELTRON Command Center in the middle, and finally the Motor Vehicle Department at the top. This new mechanism replaces the hierarchy of the traffic police personnel at the bottom, and the MVD command center at the top. In addition to the need of visualizing the entire machinic assemblage Pasquinelli (2023) further draws from Turing's visualization of the Automated Computing Engine as a hierarchy of master servant roles and proposes a labor theory of machine intelligence. With the integration of tech experts, we may note the emergence of new hierarchies where subordinate level police personnel like traffic cops are replaced by AI cameras and the KELTRON command center, but police personnel are retained in a final decision-making capacity to bulk approve decisions that have already been made.

These emergent hierarchies complicate the experiment in dependency as it creates new dependencies, while constraining avenues of negotiability. While the aspiration may be anticolonial, it is not yet a beacon of alternative tech development. It inevitably encounters the digital development dilemma, wherein it produces infrastructures that are simultaneously enabling and restricting (Akbari 2025). While the example of a public sector undertaking developing algorithmic infrastructure for state service is exceptional in enabling the State, it simultaneously incorporates the logic of machinic superiority and human inferiority that significantly reduces the capacity of human individuals to make meaningful decisions. Note that in this new hierarchy, the traffic cop is replaced by an AI camera. Retaining “human agency” in the assemblage is a superior officer batch approving cases of violations that the AI camera has detected, which raises concerns over whether these are truly meaningful decision-making practices, that rely on human intelligence, or whether the human in this loop is retained as a rubber stamp. Furthermore, the desire for independence in tech development can never truly be absolute. Recall how Nigesh noted that developing this mechanism was possible because of the availability of NVIDIA chips. This produces another form of dependency as NVIDIA has a near monopoly over chip manufacture, and therefore the State would be dependent on private technology in some aspects.

Nevertheless, it is worth engaging with such forms of alternative tech developments. The point in this engagement is not to see whether the state can be truly independent and self-contained. In a globalized world with globalized chains of production, it may be impossible to be self-contained. Yet, interdependencies that represent unequal relations especially pertaining to dependency can be challenged. In here lies the postcolonial politics which is anticolonial in nature in the Kerala experiment. Here the desire for independent tech development, weds algorithmic governance with anticolonial legacy of the state and offers a compelling case study of the dynamics that emerge when an anti-colonial postcolonial state adapts a governance mechanism introduced by neoliberal capitalist states.

6 | Conclusion

Since these new hierarchies are only emerging, their larger implication remains to be seen. However, to do so, we need appropriate theoretical frameworks that allow us to accurately visualize and document these new emergent power relations. We may perhaps begin by understanding algorithmic governance in its plurality. Algorithmic governance is not universal, it is heavily contingent on context, and therefore it is possible to view multiple forms of algorithmic governance that manifest differently in the majority and minority world.

I try to do this by asking whether current transformations in Kerala may be understood as a Kerala model of algorithmic governance (Varghese 2024) bringing the frameworks of algorithmic governance and postcoloniality in conversation. This may potentially offer a new model of algorithmic governance, which is a politically relevant and necessary act of transcendence, is humane and sustainable, and is perhaps built by bypassing private technology and big capital. This would be possible if this alternate model is *able to continue the Kerala model's fundamental premise of radical redistribution of available resources through public participation*. This transformation however is shaped by dominant interests, powers and modes of resistance and is a largely dynamic field.

The Kerala model and its relation to algorithmic governance and postcoloniality is thus one way of framing the question of how HCCs and algorithmic governance is transforming the state. It helps us look at the context in which algorithmic governance is perceived, adapted, and implemented, while understanding the operational power relations that guide these transformations. Further research however is needed to unpack how in the context of algorithmic governance in Kerala, new dilemmas are emerging. These are still unclear since

algorithmic transitions are at a nascent stage. However, to comprehend these transformations, we need conceptual frameworks that view algorithmic governance together with postcoloniality to effectively analyze potential alternatives *of* algorithmic governance.

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Data Availability Statement

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Endnotes

[1] For a detailed discussion on digital veillance see Lupton, Deborah. "Theorising Digital Society." *Digital Sociology*, Routledge, 2015, 20–41.

[2] For a detailed discussion on data colonialism see Mejias, Ulises A., and Nick Couldry. Data Grab: The New Colonialism of Big Tech and How to Fight Back, University of Chicago Press, 2024.

[3] The names of participants have been anonymized to maintain confidentiality.

References

Abraham, I., and A. Rajadhyaksha. 2015. "State Power and Technological Citizenship in India: From the Postcolonial to the Digital Age." *East Asian Science, Technology and Society* 9, no. 1: 65–85. https://doi.org/10.1215/18752160-2863200.

Administrative Reforms Commission. 2021. Government of Kerala. Eleventh Report. https://arc.kerala.gov.in/sites/default/files/inline-files/11thReport-e-Governance-Part1%262-Forprinting.pdf.

Akbari, A. 2025. "Digital Development Dilemma: From Progress to Control." In *Critical ICT4D (Information and Communication Technologies for Development)*, edited by A. Akbari and S. Masiero, 15–29. Routledge.

Alam, S. 2008. "Majority World: Challenging the West's Rhetoric of Democracy." *Amerasia Journal* 34, no. 1: 88–98. https://doi.org/10.17953/amer.34.1.l3176027k4q614v5.

Bauman, Z., and D. Lyon. 2013. "Liquid Surveillance as Post-Panoptic." In *Liquid Surveillance*, 52–75. Polity Press.

Benjamin, R. 2019. *Race After Technology: Abolitionist Tools for the New Jim Code*. Polity Press.

Besteman, C., and H. Gusterson, eds. 2019. *Life by Algorithms: How Roboprocesses Are Remaking Our World*. University of Chicago Press.

Brayne, S. 2021. *Predict and Surveil: Data, Discretion, and the Future of Policing*. Oxford University Press.

Economic Times. 2023. "AI Cameras to Check Traffic Violations in Kerala: Fully Automated System Can Issue 30000 Challans in a Day." https://economictimes.indiatimes.com/news/india/ai-cameras-to-check-traffic-violations-in-kerala-fully-automated-system-can-issue-30000-challans-in-a-day/articleshow/99631637.cms.

Franke, R. W., and B. H. Chasin. 1992. "Kerala State, India: Radical Reform as Development." *International Journal of Health Services* 22, no. 1: 139–156. http://www.jstor.org/stable/45131029.

Go, J. 2023. "Thinking Against Empire: Anticolonial Thought as Social Theory." *British Journal of Sociology* 74, no. 1: 118–133. https://doi.org/10.1111/1468-4446.12993.

Heller, P. 1999. *The Labor of Development: Workers and the Transformation of Capitalism in Kerala, India*. Cornell University Press.

Issar, S., and A. Aneesh. 2021. "What Is Algorithmic Governance?" *Sociology Compass* 16, no. 1: e12955. https://doi.org/10.1111/soc4.12955.

Kallungal, D. 2024. *Within a Year, MVD Strikes It Rich Through AI Cameras*. Hindu. https://www.thehindu.com/news/national/kerala/within-a-year-mvd-strikes-it-rich-through-ai-cameras/article68378601.ece.

Kannan, K. P. 2023. "Revisiting the Kerala 'Model' of Development: A Sixty-Year Assessment of Successes and Failures." *Indian Economic Journal* 71, no. 1: 120–151. https://doi.org/10.1177/00194662221145290.

Katzenbach, C., and L. Ulbricht. 2019. "Algorithmic Governance." *Internet Policy Review* 8, no. 4. https://doi.org/10.14763/2019.4.1424.

Kuldova, T. Ø. 2022. *Compliance-Industrial Complex: The Operating System of a Pre-Crime Society*. Palgrave Macmillan.

Lupton, D. 2015. *Theorising Digital Society*, 20–41. Digital Sociology, Routledge.

Mannathukkaren, N. 2010. "The 'Poverty' of Political Society: Partha Chatterjee and the People's Plan Campaign in Kerala, India." *Third World Quarterly* 31, no. 2: 295–314. https://doi.org/10.1080/01436591003712007.

Mejias, U. Ali, and N. Couldry. 2024. *Data Grab: The New Colonialism of Big Tech and How to Fight Back*. 1st ed. University of Chicago Press.

Parayil, G. 1996. "The 'Kerala Model' of Development: Development and Sustainability in the Third World." *Third World Quarterly* 17, no. 5: 941–958. https://doi.org/10.1080/01436599615191.

Pasquale, F. 2015. *The Black Box Society: The Secret Algorithms that Control Money and Information*. Harvard University Press.

Pasquinelli, M. 2023. *The Eye of the Master: A Social History of Artificial Intelligence*. Verso.

Patnaik, P. 1995. "The International Context and the 'Kerala Model'." *Social Scientist* 23, no. 1/3: 37–49. https://doi.org/10.2307/3517890.

PTI. 2025. *Kerala HC Dismisses Congress Leaders' Plea for Court-Monitored Probe into AI Camera Project*. Week. https://www.theweek.in/wire-updates/national/2025/08/27/lgm4-kl-hc-ai-cameras-congress.html.

Radhakrishnan, R. 1993. "Postcoloniality and the Boundaries of Identity." *Callaloo* 16, no. 4: 750–771. https://doi.org/10.2307/2932208.

Raghunath, A. 2023. *Kerala AI-Cameras Caught up in Privacy Breach and Corruption Allegations*. Deccan Herald. https://www.deccanherald.com/india/kerala-ai-cameras-caught-up-in-privacy-breach-and-corruption-allegations-1212552.html.

Ramachandran, V. K. 1997. "On Kerala's Development Achievements." In *Indian Development: Selected Regional Perspectives*, edited by J. Drèze and A. Sen, 205–356. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780198292043.003.0004.

Schildt, H. 2020. *'The Promises and Pitfalls of the Data Imperative.' the Data Imperative: How Digitalization Is Reshaping Management, Organizing, and Work*, 179–200. Oxford University Press.

Seaver, N. 2017. "Algorithms as Culture: Some Tactics for the Ethnography of Algorithmic Systems." *Big Data & Society* 4, no. 2: 1–12. https://doi.org/10.1177/2053951717738104.

The Hindu Bureau. 2023. *AI Cameras Helped Bring down Road Accident Deaths, Rule Violations: Antony Raju*. Hindu. https://www.thehindu.com/news/national/kerala/ai-cameras-helped-bring-down-road-accident-deaths-rule-violations-antony-raju/article67235424.ece.

Valente, J. C. L., and R. Grohmann. 2024. "Critical Data Studies With Latin America: Theorizing Beyond Data Colonialism." *Big Data & Society* 11, no. 1: 1–13. https://doi.org/10.1177/20539517241227875.

Valluvan, S., and N. Kapoor. 2023. "Sociology After the Postcolonial: Response to Julian Go's 'Thinking Against Empire'." *British Journal of Sociology* 74, no. 1: 134–142. https://doi.org/10.1111/1468-4446.12995.

Varghese, A. 2021. "Combating Capitalism: A Case Study of Left Polity in Kerala." *International Critical Thought* 11, no. 2: 303–320. https://doi.org/10.1080/21598282.2021.1886593.

Varghese, A. 2024. "E-Governance and Smart Policing in Kerala, India: Towards a Kerala Model of Algorithmic Governance?" In *Policing and Intelligence in the Global Big Data Era, Volume I*, edited by T. Ø. Kuldova, H. O. I. Gundhus, and C. Thea Wathne, Palgrave's Critical Policing Studies. Cham: Palgrave Macmillan. https://doi.org/10.1007/978-3-031-68326-8_7.

Weber, M. 1948. "Bureaucracy." In *From Max Weber: Essays in Sociology*, edited by H. H. Gerth and C. Wright Mills, Routledge. https://doi.org/10.4324/9780203759240.

Young, R. J. C. 2009. "What Is the Postcolonial?" *Ariel* 40, no. 1: 13–25. https://journalhosting.ucalgary.ca/index.php/ariel/article/view/33560.