
Thanks to the organizers for making it possible for me to be here, and to all of you for making it possible for me to give this keynote in English, a privilege that I don't take for granted.

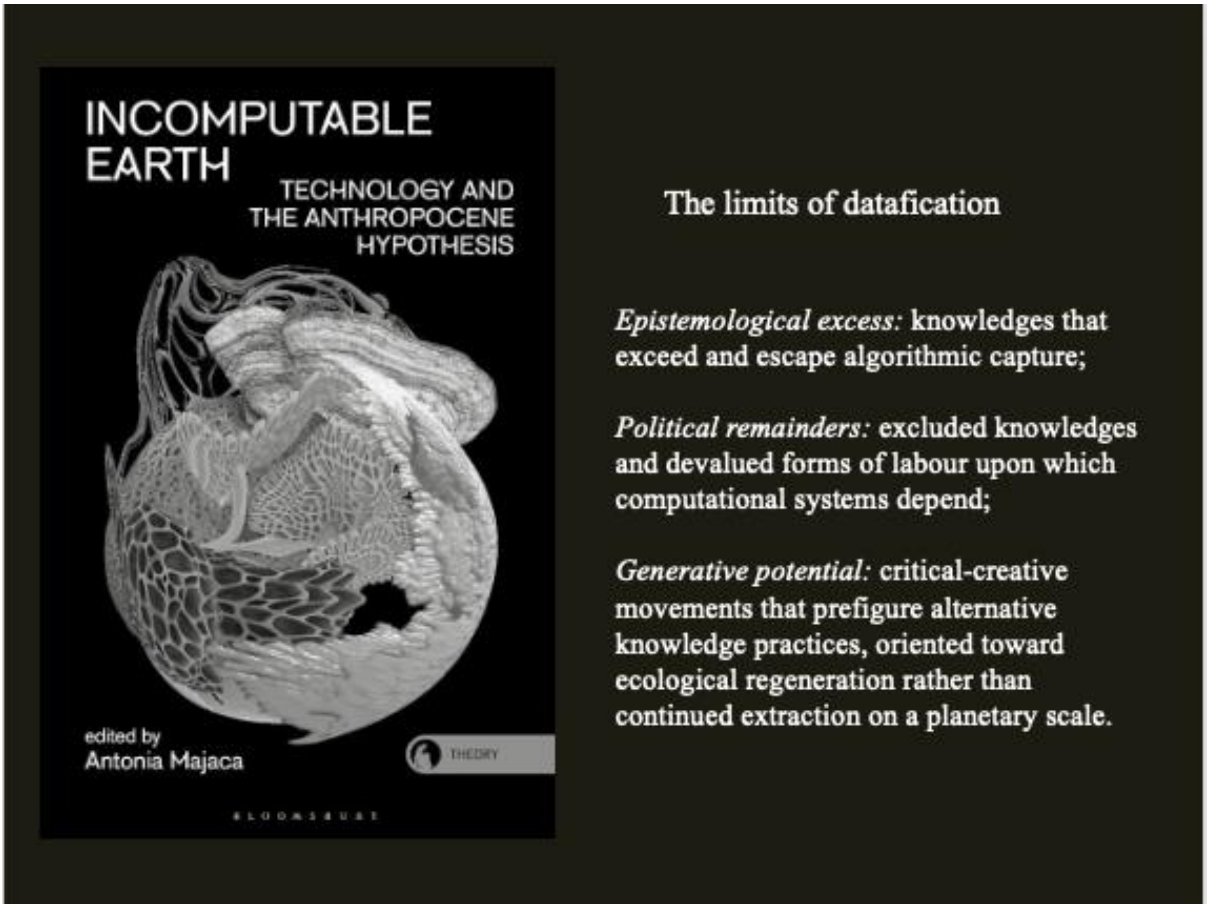
Before I get to my title and the heart of my talk, let me begin with some thoughts about what it means to frame an event as a decennial. It's a designation that proposes a through-line, from a collective assembled in 1975 to those of us here today in 2025. I missed the 1975 event as I was just 24 and about to begin my PhD studies at the University of California Berkeley. I hadn't yet knowingly encountered a computer in 1975, much less the company of friends just forming up the project of work-oriented co-design here in Scandinavia. That meeting wouldn't happen until around the time of the second decennial in 1985, but I'll come back to that in a moment.

The decennial framing invites us to revisit what Pelle Ehn has identified as the generative frictions between tradition and transcendence, that which we draw from and want to sustain, and that which we hope to transform. Thinking about it in another way, we could ask about the relations between generations and regeneration. This assumes that we understand regeneration not as the ouroboros like processes through which LLMs are now eating the internet to regurgitate seemingly meaningful output, but rather as renewal across generations in the transformative processes through which the human and more than human world are continuously remade.

Over these past 50 years computing has achieved hegemonic status, born from a confluence of mid-twentieth century military and industrial projects committed to the closed-world imaginary of rationality and control. The experiments conducted here in Scandinavia in the 1970s at the intersections of Marxist-informed industrial democracy and strong labour unions were demonstrations of how computing could be made otherwise, if designed with the aims

of enhancing the quality of working life both experientially and in terms of its products. Developments since then are testimony to the holding power of military-industrial and increasingly commercial interests, further consolidating centralisations of power and marginalising alternatives. While I'll spend some time elaborating those dark developments, the point in the end is not to abandon hope but rather to redouble our commitments to the institutions and collectives that provide resources for worlding otherwise. These must be projects of co-design between those caught up in architectures of militarism and extractive capitalism, and those committed to regenerating pathways to sustainable life and livelihoods for all.

Which brings me to my title, and a bit of an explanation as to why I've chosen to leave the 'x' as a signifier of a variable intersection, a relation, a site of difference between computing and its objects, and to replace 'crisis' as our constant with 'open worlds'. This is because I want to explore how our current crises relate to the incomputability of open worlds, and to the zones of ignorance that computing enables.



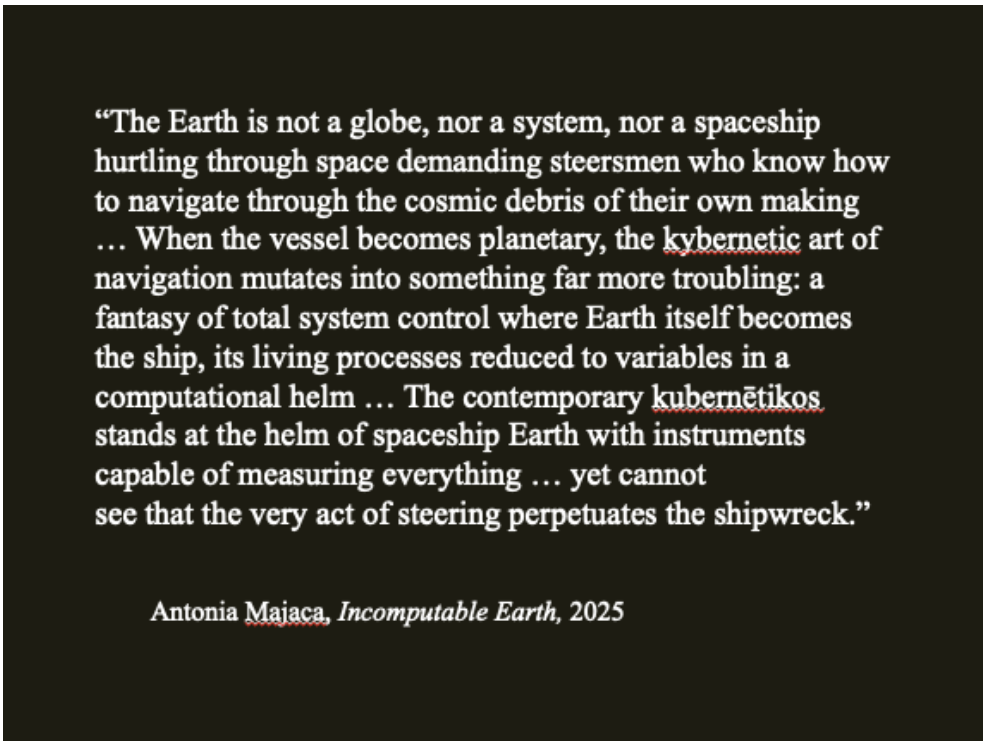

Let me begin to unpack this with the help of a forthcoming book titled *Incomputable Earth*. In her introduction to the collection, editor Antonia Majaca articulates the legacies and limits of computing as a technology of command and control. Antonia designates three dimensions to the limits of datafication.

*Epistemological excess:* or knowledges that exceed and escape algorithmic capture;

*Political remainders:* comprising excluded knowledges and devalued forms of labour upon which computational systems depend; and, crucially

*Generative potential:* those critical-creative movements that prefigure alternative knowledge practices, oriented in the case of incomputable earth toward ecological regeneration rather than continued extraction on a planetary scale.

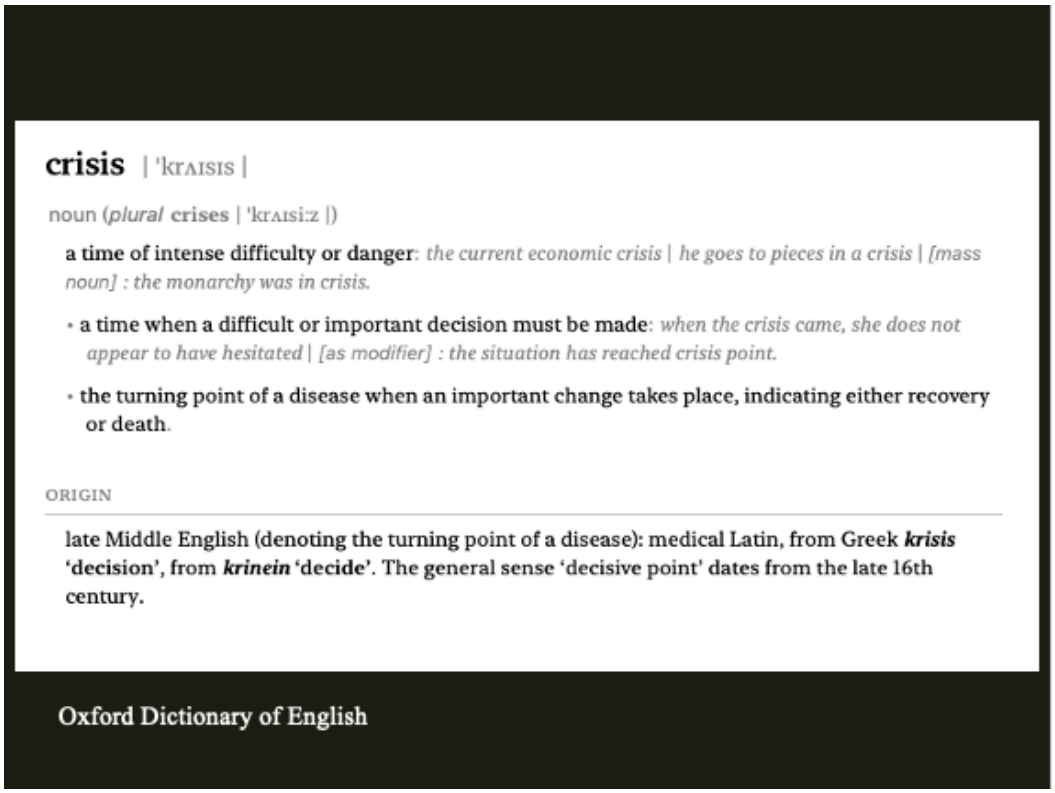
While articulated here in relation to the climate crisis, these dimensions will no doubt be recognizable to those of you engaged in various forms of regenerative co-design. They are identified by Antonia as elements of a profound critique of the concept of the Anthropocene, and more fundamentally of the technopolitical imaginaries that position 'Man' or the 'Human' with initial capitals as earth's planetary steersman or overseer. An essential element of the critique, as Antonia puts it, is to 'decapitalize' the human, opening that figure to the multiple knowledges and practices that comprise human and more than human relations. Together the collection's contributors dismantle the colonial and extractive apparatus of quantification to recover openings provided by indigenous, feminist, and anticolonial scholarship for earthly regeneration.




"The Earth", Antonia writes, "is not a globe, nor a system, nor a spaceship hurtling through space demanding steersmen who know how to navigate through the cosmic debris of their own making … When the vessel becomes planetary, the kybernetic art of navigation mutates into something far more troubling: a fantasy of total system control where Earth itself becomes the ship, its living processes reduced to variables in a computational helm … The contemporary kubernētikos stands at the helm of spaceship Earth with instruments capable of measuring everything … yet cannot see that the very act of steering perpetuates the shipwreck."

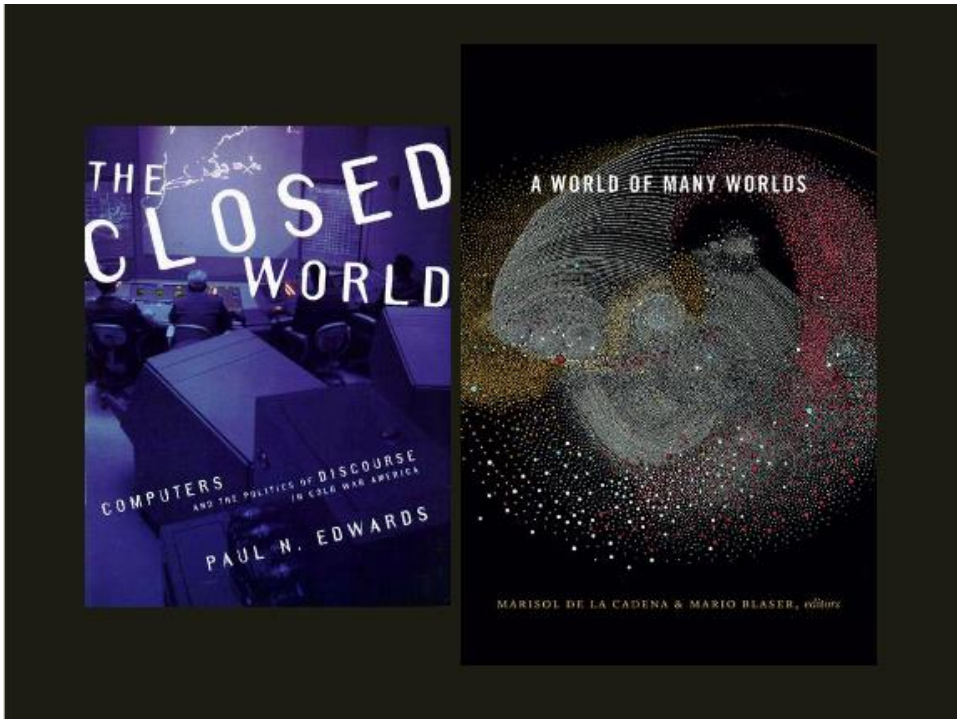
I'll come back to the figure of the 'computational helm' through the case of my current work on data-driven warfighting, as it perpetuates the shipwreck of planetary insecurity. A conjoining premise between command and control of the planet and of the battlefield is that to grasp the wholeness of something requires attaining a position exterior to the thing to be

comprehended. Processes rendered through datafication are taken to be naturally accelerating, which becomes the justification for the expansion of data infrastructures, which in turn produces more acceleration, and so on.



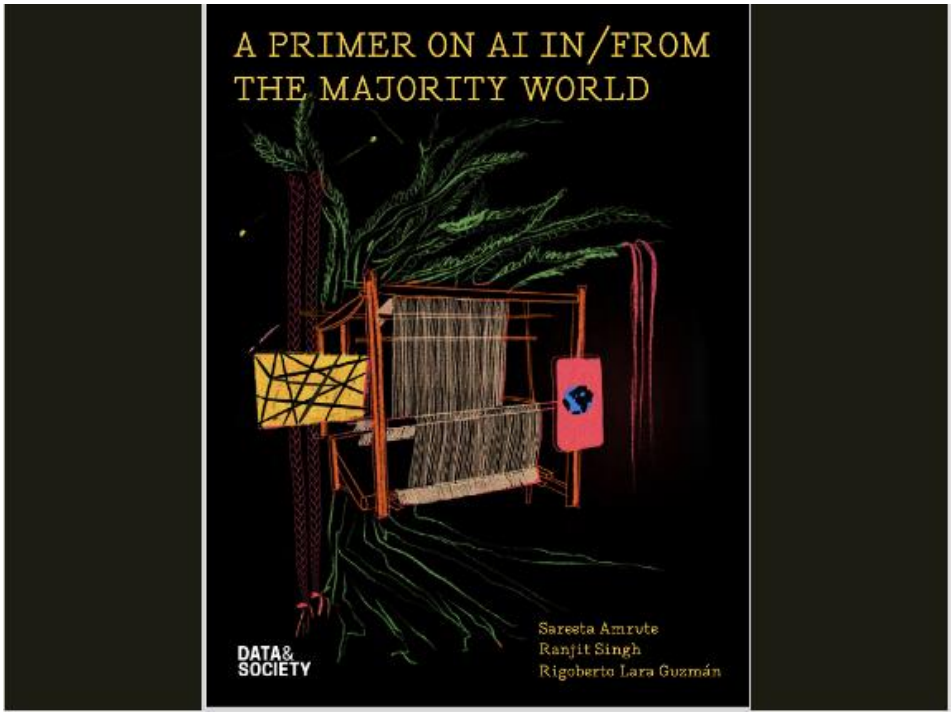

With that said, let me pause for a moment on the term 'crisis', which I want to treat not as a designator of a state of the world, but as a rhetorical act that names a problem in urgent need of address. Crucial questions often left begging are how is the problem defined, and by whom? And what is the range of possible solutions? Depending on the answers to these questions the declaration of a crisis can either be a call to transformative action or an excuse for the suppression of change in favour of entrepreneurial opportunities and authoritarian interventions designed to preserve the status quo. In the case of economic crises, for example, the 'crisis' can be understood as an outcome of centuries of colonialism, extractive capitalism, and wealth inequality calling for radical initiatives in social innovation, or as an opportunity for new consolidations of capital, the imposition of regimes of austerity on those least able to afford them, and accelerated investments in proprietary technologies.

In the moment, we are in a struggle for definitions of the problem. To oversimplify, on one side are those with vested interests in promoting accounts of our current condition that set up the grounds for technosolutionism. On the other are those who suggest that it is this framing that perpetuates a state of crisis, by silencing analyses of the histories that have created our current conditions and identify more radical pathways to different futures.

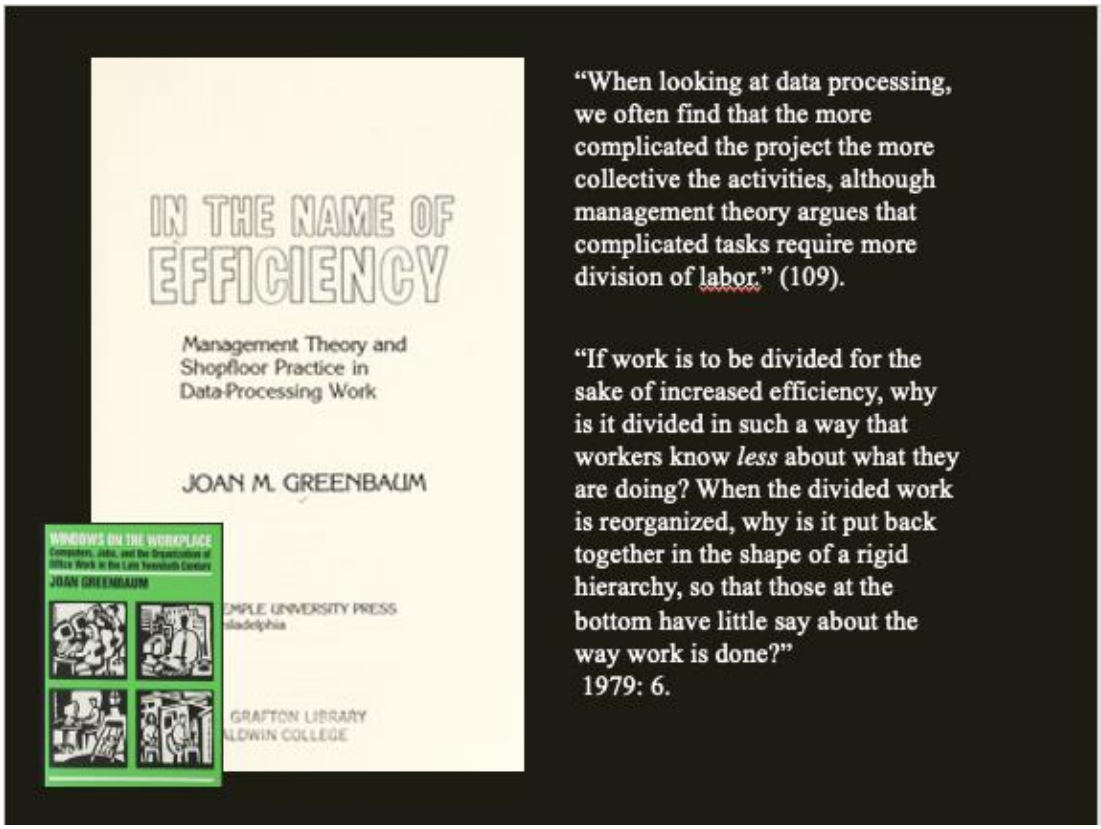



My thinking here is guided by the figures of closed and open worlds. The closed world is the ideology that underwrote the Cold War arms race between the United States and the Soviet Union at the end of the 20th century, described brilliantly by historian of science Paul Edwards in his 1996 book of that title. Set against this imperial stand-off is a decolonial imaginary named by anthropologists Marisol de la Cadena and Mario Blaser in their 2018 book of that title as "a world of many worlds." This follows calls by indigenous leaders, most famously the Zapatista in Chiapas, Mexico, for in their words "a world where many worlds fit." I want to suggest that we can think of these as two aspirational approaches to global security, one based on containment through military domination, the other on negotiated co-existence across even irreconcilable differences.

I start from the premise that technologies of datafication, particularly those currently promoted under the sign of AI, require closed worlds for their operation, and that understanding that requirement can help to clarify data's limits. Acknowledging the limits of datafication, in turn, opens our thinking to other modes of knowledge making that might configure our relations differently, with each other and with the more than human world.




I want to acknowledge that those more radical pathways are being set out now by communities that expand and enrich the original company of co-designers gathered here in 1975. As one example we can take this primer on AI in/from the majority world, assembled by Sareeta Amrute, Ranjit Singh, and Rigoberto Lara Guzmán. Mindful of these teachings, I'm going to be focusing my remarks today on experiences from my own position at the intersections of the minority, hyper-developed worlds of the United States and Europe, a location with its own forms of parochialism, but one that also bears greatest responsibility for recovering the histories of closed world technopolitics and opening pathways to more just and sustainable futures.




To recover those histories and pathways requires a bit of return, not to a nostalgic past that never existed but to some of the roots from which our collective here has grown. As I mentioned, during the first decade of our decennials those of us here from my generation were at work on our PhD theses.

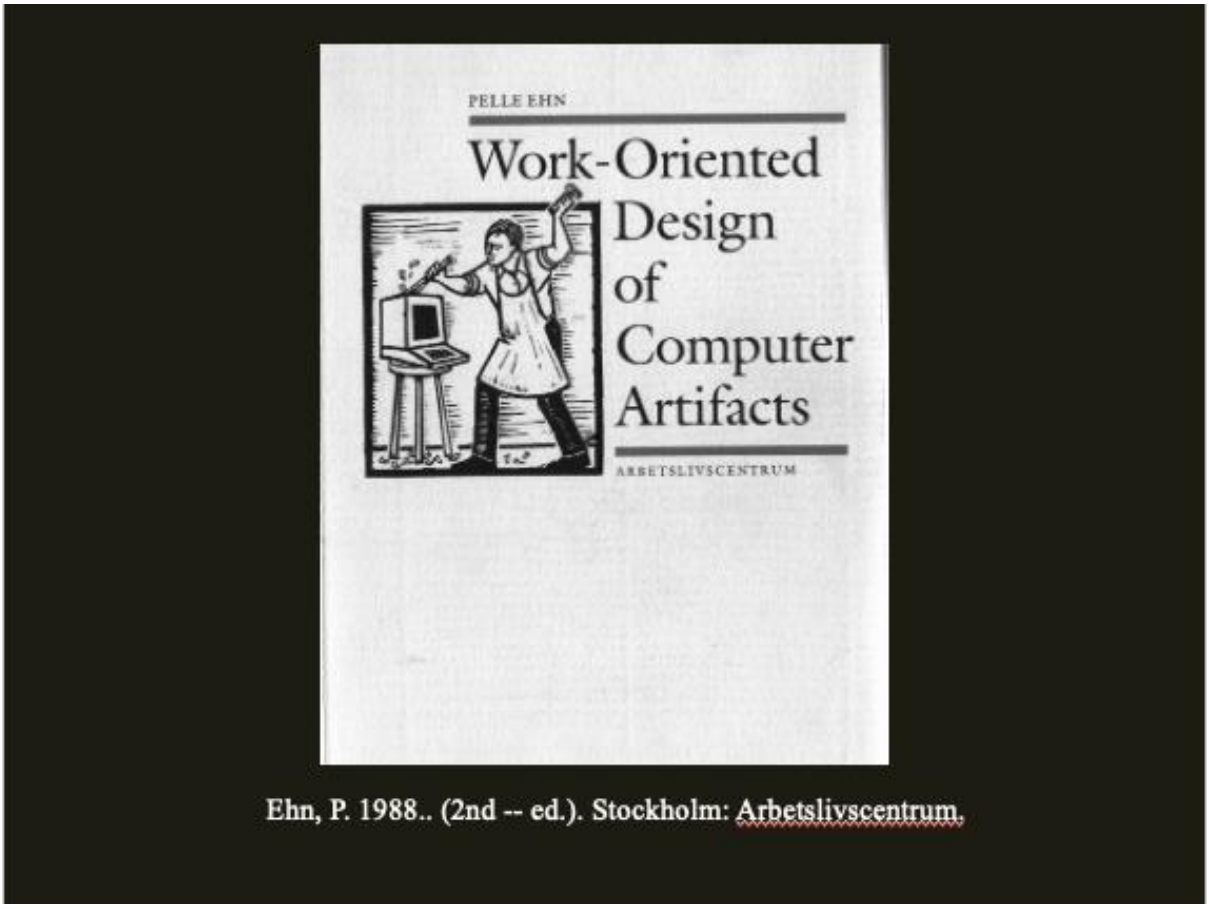
In 1979, Joan Greenbaum published her dissertation *In the Name of Efficiency*, a study of the realities of data processing labour as it was being configured in the United States at the time. Note that Joan's analysis was updated in her subsequent book *Windows on the Workplace*, published in 1995.

The book opens with Joan's reflection on her experience as a programmer in the US in the 1960s (along with then roughly 200,000 others), and the signs of change that were emerging. As the volume of work increased, she observes, wages did the opposite. Counter management declarations of an economic crisis, she argues, the push for efficiency was driven by a commitment to the maintenance of managerial power in the face of new forms of knowledge and expertise that threatened to escape its control. Efficiency, in turn, was translated by the legacies of scientific management into increased routinization and repetition, through divisions of labour designed to minimize practitioners' co-design of their own work. Reflecting on her experience as a programmer, Joan observes a contradiction between management theory and work practices:

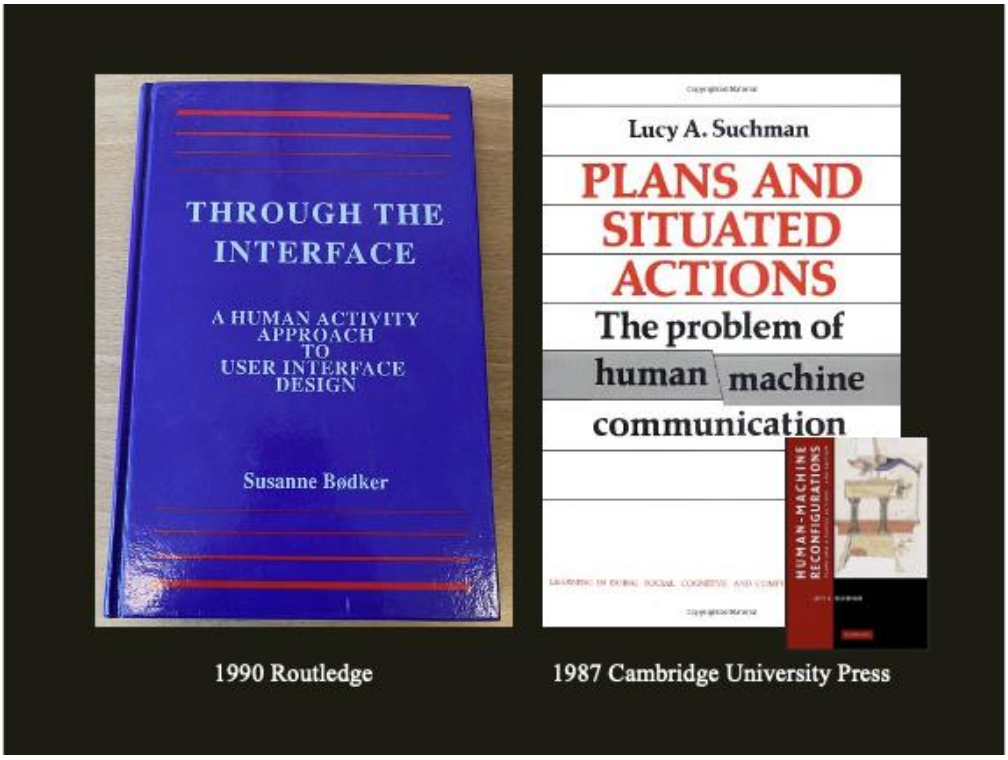
"When looking at data processing we often find that the more complicated the project the more collective the activities, although management theory argues that complicated tasks require more division of labor" (109). Even accepting the value of divisions of labour, she asks, "If work is to be divided for the sake of increased efficiency, why is it divided in such a way that workers know *less* about what they are doing? When the divided work is reorganized, why is it put back together in the shape of a rigid hierarchy, so that those at the

bottom have little say about the way work is done?" (6) (which of course is what constitutes being 'at the bottom').

The answer in brief is control: Managerial authority over work develops not because workers are unable to direct their work themselves, but rather to prevent them from doing so. Cooperation and collective action don't require invention, Joan argues, but rather they need to be systematically suppressed through ideologies of individualism and competition.



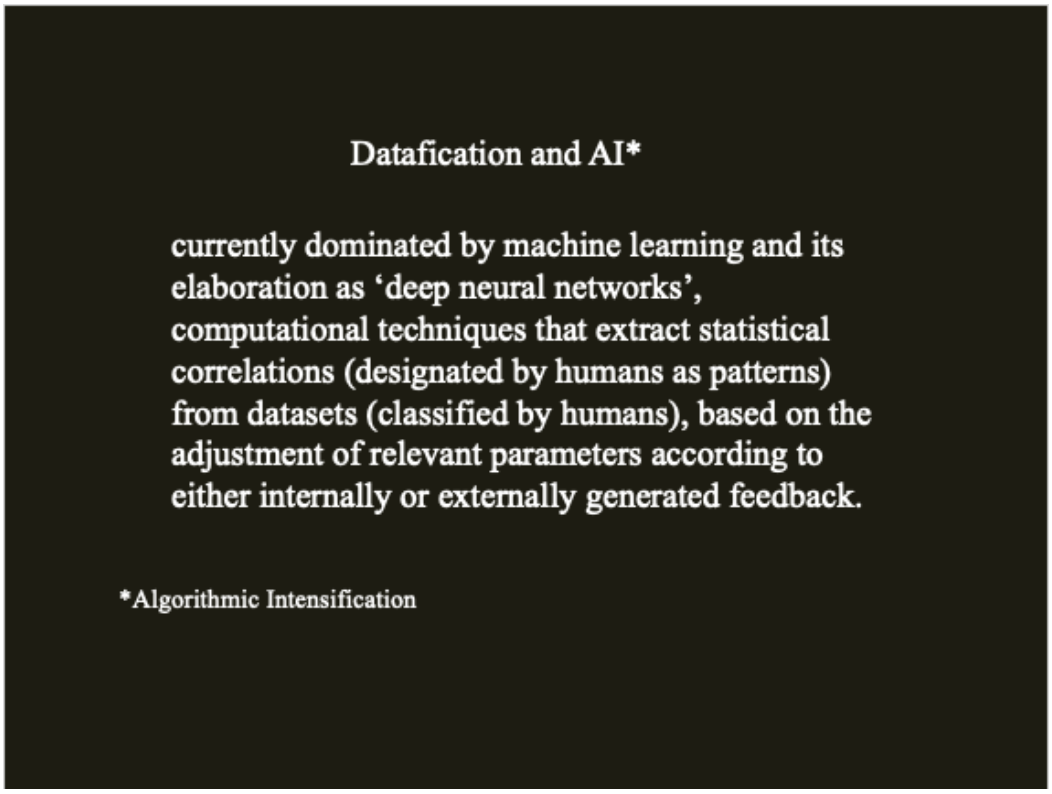

Around the time of Joan's dissertation, the question of how the design of work and technology could be otherwise was addressed at length in another dissertation, Pelle Ehn's *Work-Oriented Design of Computer Artifacts* published in 1988. In the early days of collaboration with Nordic trade unions in the 1970s, Pelle recounts, informatics researchers served as 'resource persons' for 'investigation groups' in which unions made inquiries into their own working conditions, with particular attention to technology. From 1981 to 1986 the Utopia project built on earlier projects as researchers from the Swedish Centre for Working Life and the Royal Institute of Technology in Stockholm, and DAIMI at the University of Aarhus, joined with local trade unions to influence the design of graphic workstations in early development at that time. The transformation in strategy was to join resistance to technologies that enforced detailed divisions of labour with demonstrations of how practices of co-design could create systems in support of working together and the expansion of workers' knowledge and skills.




Meanwhile two other dissertations were also underway, informed by then emerging projects of interactive interface design. It was here that I first encountered Scandinavian co-design, through the person of Susanne Bodker who visited Xerox Palo Alto Research Center or PARC in 1982. Susanne's visit coincided with my own research internship at PARC, as a PhD student in anthropology at UC Berkeley.

In an oral history conducted by the Charles Babbage Institute for ACM SIGCHI, Susanne explains that the money that sent her to PARC was the result of a lottery among graduates in mathematics in Denmark. "You win this lottery and you make a plan for where you go. Kristen [Nygaard] said you should definitely go to Xerox PARC [to work with Adele Goldberg and the Smalltalk group] and so I did." This was, she recounts, her first encounter with graphical workstations, just coming into use back in Aarhus.

Susanne and my dissertations emerged around new conceptualizations of the interface as a site of engagement; for Susanne, engagement with but, more importantly through, the interface to co-workers and the work at hand, for me as a site to articulate the limits of the AI planning model and associated cognitivist renderings of the open worlds of human action and interaction.




If the first Aarhus gathering was focused on exploring how computer artifacts could be designed as tools for skilled workers, in the decades since computing has become the infrastructure for a breadth of automation projects that would have been difficult to imagine then. Most recently, due to massive expansions in data generation and computing power, what was a somewhat esoteric subfield of computer science in the 1970s and 1980s has become a monstrous figure highly mystified by those with vested interests in algorithmic intensification (an alternative expansion of the acronym suggested to me by Andrew Clement).

AI in the current moment primarily takes the form of so-called machine learning and its elaboration as 'deep neural networks', computational techniques that extract statistical correlations (designated by humans as patterns) from datasets (classified by humans), based on the adjustment of relevant parameters according to either internally or externally generated feedback. These results are then used as the basis for automated prediction, recommendation, and decision systems, which in turn reinforce those classifications.


Along with the translation of text into calculable tokens made famous by Large Language Models, contemporary AI technologies operate over digitized images to generate so-called computer vision, the limits of which are unpacked nicely in this blog post by computer scientist Andrej Karpathy, then Sr. Director of AI at Tesla (also referenced by Melanie Mitchell in her book *Artificial Intelligence: A guide for thinking humans*). What would it take, Karpathy asks, for a computer to understand this image as you or I do? He challenges us to think explicitly of the culturally specific knowledge that informs our seeing and makes the image sensible to us. Here's an initial list:

You recognize it as a photo of a group of people, together in a place that looks like a locker room.

You recognize Barack Obama from the profile of his head. It helps that he's in a suit and that he's surrounded by other people in suits; this also suggests that they don't really belong in this place but are just visiting, though from the photo alone it's hard to know why or where exactly.

You recognize that there's a person standing on a scale, even though the scale is white and blends with the background. You've likely used the person's pose and knowledge of how people interact with objects to figure that out.

You recognize that Obama has his foot positioned just slightly on top of the scale. That means that you've projected a 3D structure to the scene, not just the position of the leg in the 2D coordinate system of the image.

You know enough of how the physical world works to assume that Obama's foot applies a force on the scale. Since the scale measures the force that's applied to it, it will over-represent the weight of the person standing on it.

The person measuring his weight is likely not aware of Obama doing this. You derive this from his position, the fact that he can't see directly behind him, and that he's not very likely to sense the slight push of Obama's foot.

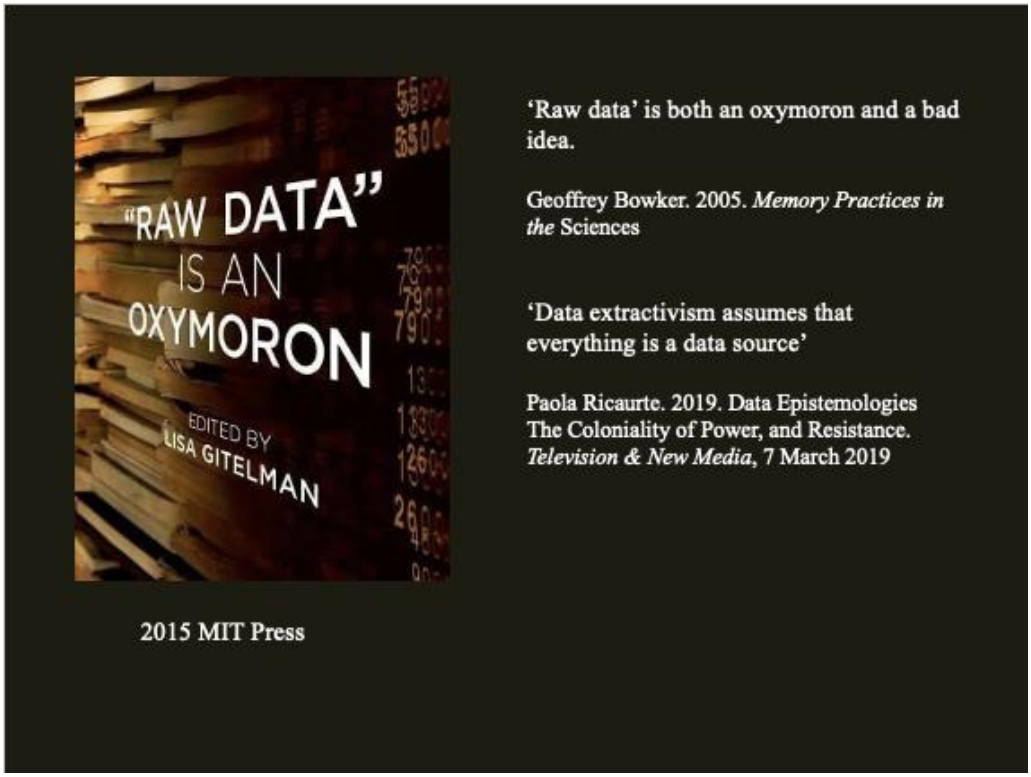
You understand that people are self-conscious about their weight. You also understand that the weight shown will probably be higher than what the person expects. In other words, you think about implications of the events that are about to unfold seconds after this photo was taken, and what the people in the photo might think and feel.

You see that both Obama and the people watching appear to find the situation funny. Obama is joking around.

Finally, the fact that the perpetrator here is the US president at the time makes this more amusing than it would be if we didn't know any of these people. We understand what actions are more or less likely to be undertaken by different people based on their status and identity, and that this is a bit outside the norm.

As Karpathy observes we could go on indefinitely, but the point here is that you've read off a huge amount of information from the scene in the moments that you look at the picture and smile.

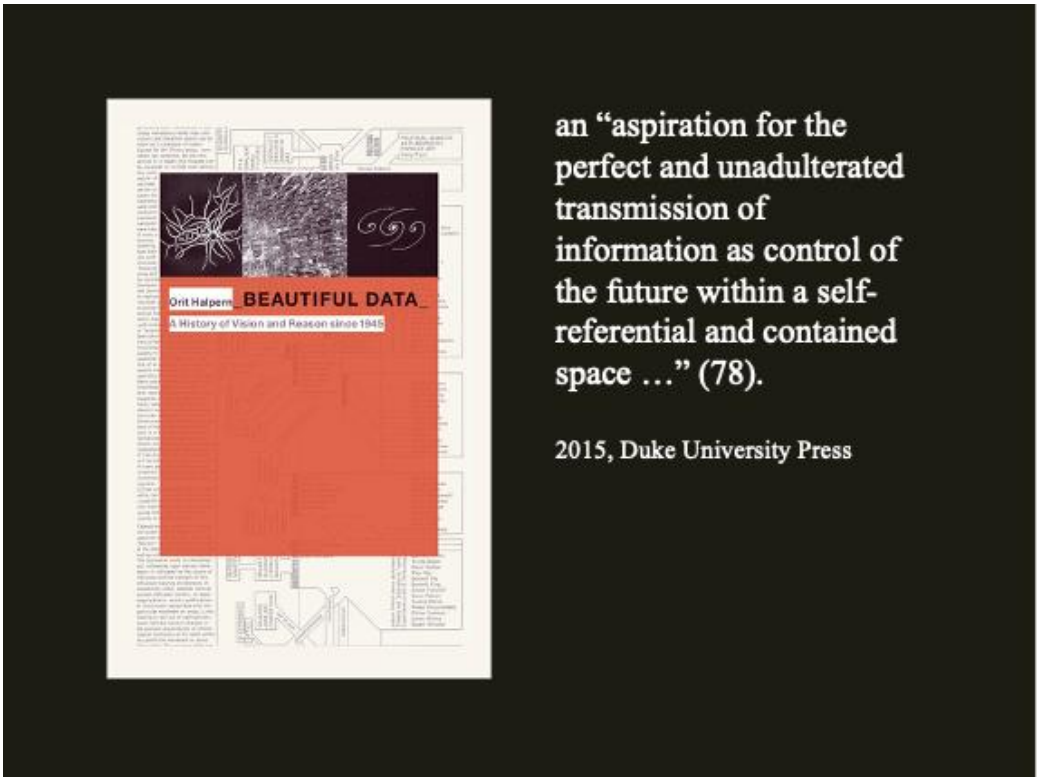
To demystify AI, then, we need to excavate the practices of abstraction through which lively subjects, objects, activities and relationships become data inputs for algorithmic models. Operations of datafication require rendering worlds of interest into categories of sameness or difference translatable into numbers, a process that necessarily 'reduces' the heterogeneity and contingency of the worlds that data claim to represent. The aggregated discreteness and abstracted homogeneity of each 'datum' is what makes data calculable.




This becomes a problem, Lisa Gitelman and co-authors have argued, when data are naturalized by the erasure of the practices through which classification and enumeration get

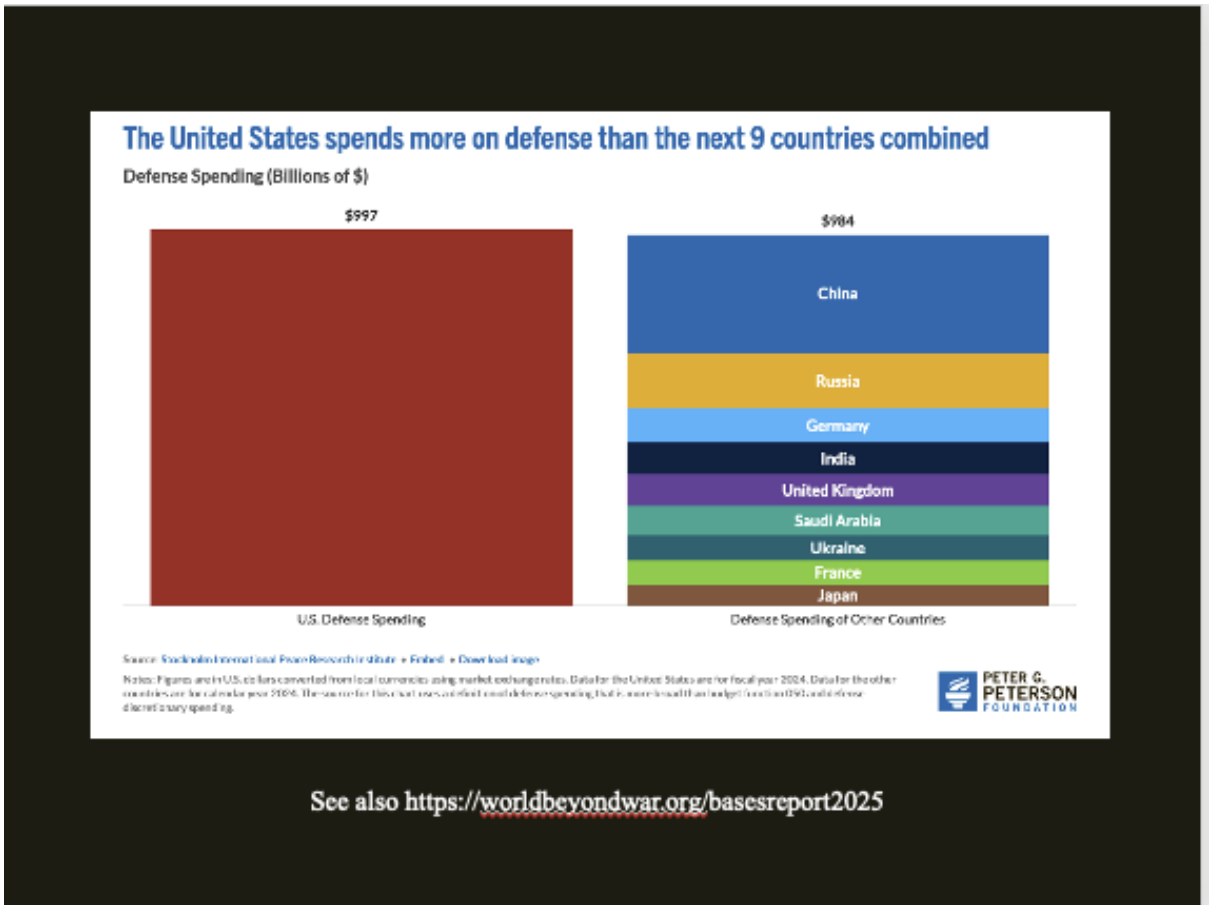
done. As Geoffrey Bowker first articulated the problem (2005:184), ‘raw data is both an oxymoron and a bad idea.’ Figured as already delineated into units of information, ‘raw data’ suggests a form of naturally occurring resource awaiting extraction and refinement, an expression, Paola Ricaurte observes, of the coloniality of power. Data refinement includes the statistical transformation of traces of past events into predictions of probable futures. Even more than previous documentary media, data in the form of the traces left by digitisation beg enormous questions of translation and erasure.


Recovering the labours through which translation and erasure get done is the project of a growing number of scholar activists and critical technical practitioners. Far from being given by an ‘objective’ world outside of human knowledge practices, data are made within what Lilly Irani, Milagros Miceli, and their colleagues have documented as unequal political economies designed to maintain the closed worlds of surveillance capitalism. So-called ‘biases’ in data production are the result not of undisciplined, individual subjectivities outside of those politics, they show us, but rather systematic schemas imposed upon data labourers by the biases and interests of those who profit from the economies of datafication.

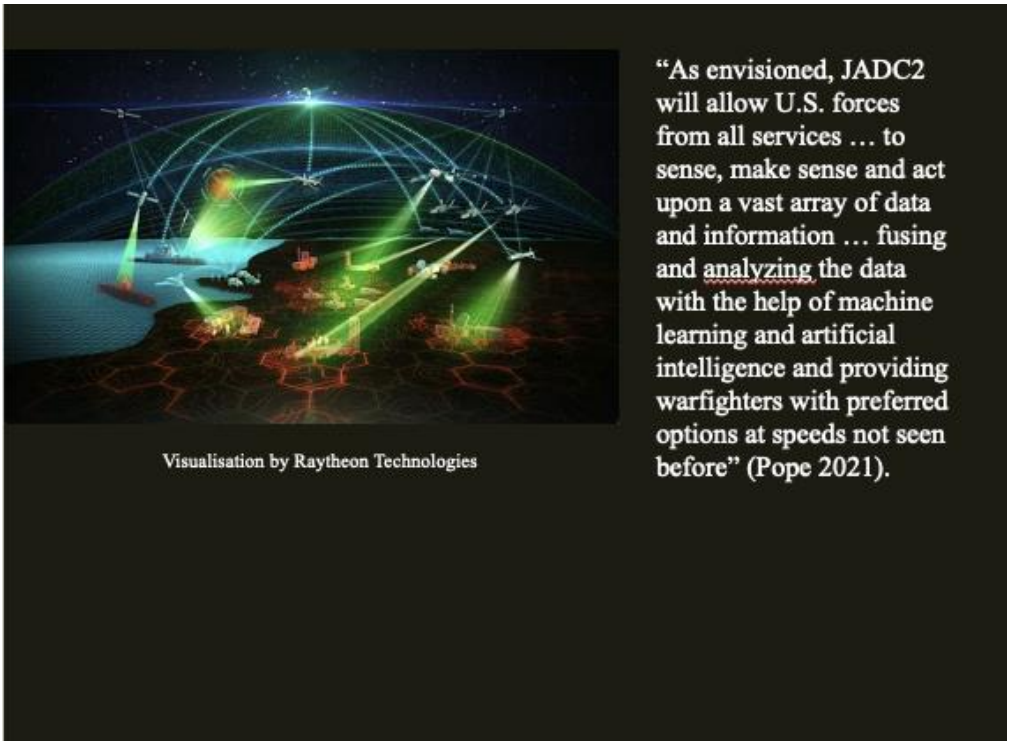



The operation of closure through datafication is part of what Orit Halpern characterizes in her book *Beautiful Data: A history of Vision and Reason since 1945* as an "aspiration for the perfect and unadulterated transmission of information as control of the future within a self-referential and contained space" (2015: 78). My aim in the remainder of this talk is to examine how the hegemony of computing relies upon and is sustained by investments in closure as the enabling condition for datafication, and how datafication is a form of world-making made possible through zones of ignorance regarding that which is incomputable. I'll try to unpack that for you drawing on my current work on the closed worlds of militarism and data-driven warfighting exemplified by the United States, but most tragically operative in the current genocide in Gaza and looming as part of the ramping up of militarism throughout the NATO alliance. My argument in brief is that, as a product of closed world imaginaries materialised from the plantation to the factory floor to the battlespace, the project of AI systematically erases the uncontainable openness of its worlds, including in this case the constitutive outsides of the machine that militarism imagines itself to be.

With that as a reference, I'll turn in the final part of my talk to initiatives that show us a through line from the early days of our collective projects beginning in the 1970s to current projects of resistance, refusal and re-imaging in open world co-design.




My focus on US militarism reflects not only my position as a US citizen, but also the extraordinary position of the US as a militarist hegemon. One way of datafying that hegemony is to translate it into levels of spending. Here's a graph showing relative military spending in 2024, which makes clear that the United States is the overwhelmingly dominant military power. The US defense budget exceeds that of the 9 next most heavily armed countries in the world combined (including both China and Russia). At latest count, the US maintains 877 military bases around the world, in 95 countries. (The biggest change in US bases in the past three years is the creation of dozens of new bases in Norway, Sweden, and Finland.) And yet in this context, we find the continuation of a discourse of US vulnerability, most recently framed as a new AI arms race between the US and China. Within this frame, the figure of AI becomes both a threat to security from them and a promise of security for us. That's how the logic of arms races work, as each side increases investment in that which threatens both – a framing that obviously serves the interests of those who reap the resulting profits.




This image was featured in a press conference in 2021 in which Charles Pope, then Secretary of the United States Air Force, announced the Joint All Domain Command and Control or JADC2 initiative. 'As envisioned,' he promises, 'JADC2 will allow U.S. forces from all services … to sense, make sense and act upon a vast array of data and information … fusing and analyzing the data with the help of machine learning and artificial intelligence and providing warfighters with preferred options at speeds not seen before' (Pope 2021).

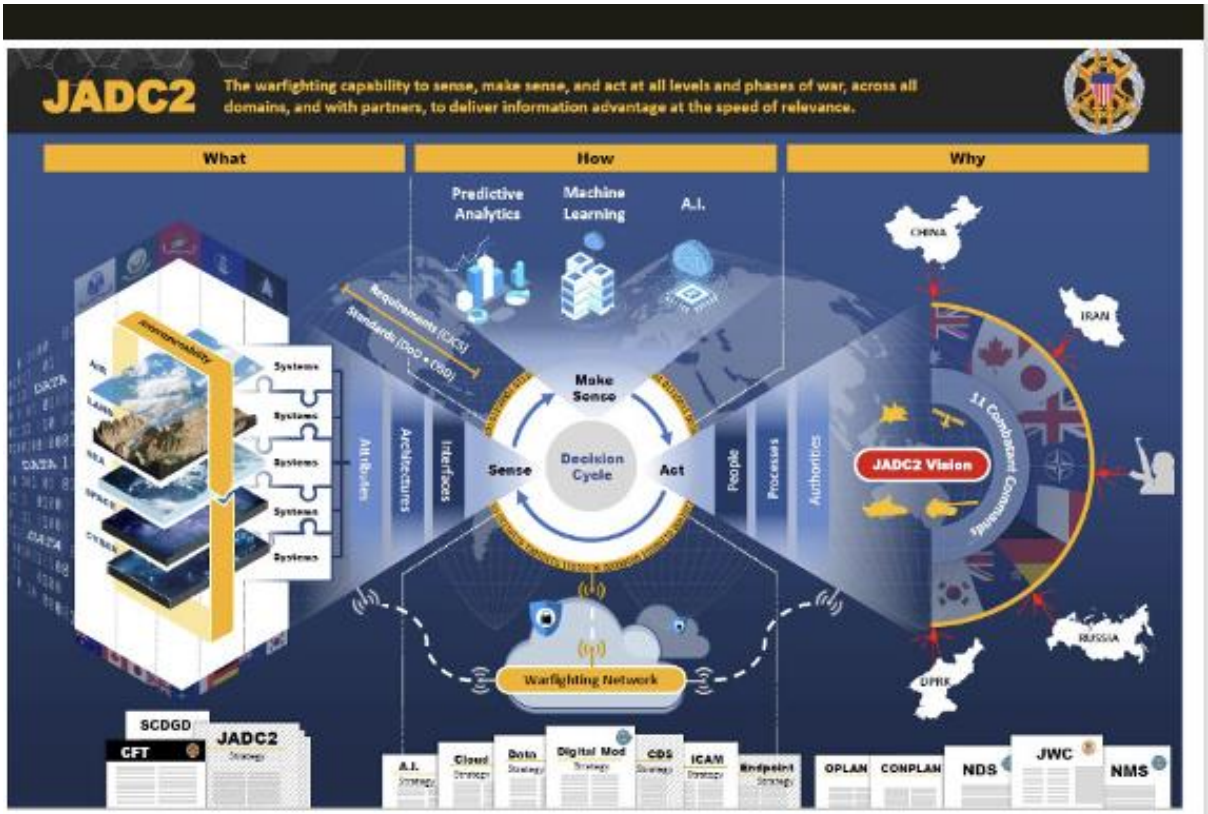


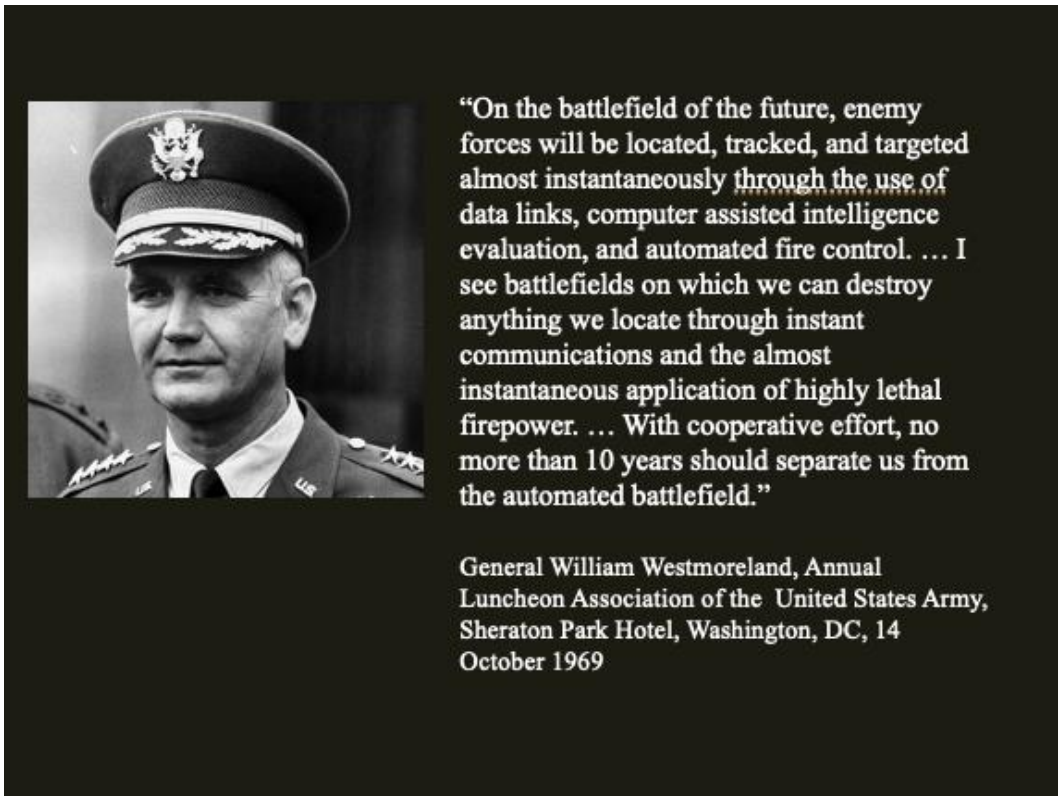

Figure 1 JADC2 Placemat

Here's another rendering of JADC2, Figure 1 from the US Department of Defense's summary of the initiative released in March of 2022. The figure titled, in a homely spirit, the 'JADC2 Placemat' was characterized by analysts from the Hudson Institute, a conservative think tank, as "a graphic that was confusing even by Defense Department standards."

Confusing perhaps but also illuminating.

We can start at the centre of the diagram where you'll find the canonical 'Decision Cycle', operating as a cognitivist reduction of warring bodies to a black box taking input received through its sensors, processing that input, and producing output in the form of action. Each 'step' in the cycle of decision is expanded into its associated components. Moving left to right we start with 'What' sources the input, imagined as 'Data' streaming in from the world beyond the frame and before the operations begin, channelled into a set of stacks, the general architecture of computing. In this case the stacks correspond to the current sorting of domains of warfighting into territories (air, land, sea, space, and cyber), which together comprise a set of interlocking and interoperable 'systems.' These input sources are then funnelled through the structuring filters of 'attributes,' 'architectures,' and 'interfaces' to make the results of the sensing apparatus accessible to decision. Or more accurately, to the further machinery designed to 'make sense' of the input through the intercessions of Predictive Analytics, Machine Learning, and the residually floating signifier 'A.I.' The aim of all of this data processing is the generation of output to be implemented by 'People, Processes, and Authorities' enacting the 'JADC2 Vision' that joins together the 11 Combat Commands to manage the state actors whose positioning as threats provides the justifying grounds for the program. Floating somewhat ambiguously below and between all of this is the 'Warfighting Network,' figured as a cross between the iconic tank and the promissory cloud, all joined

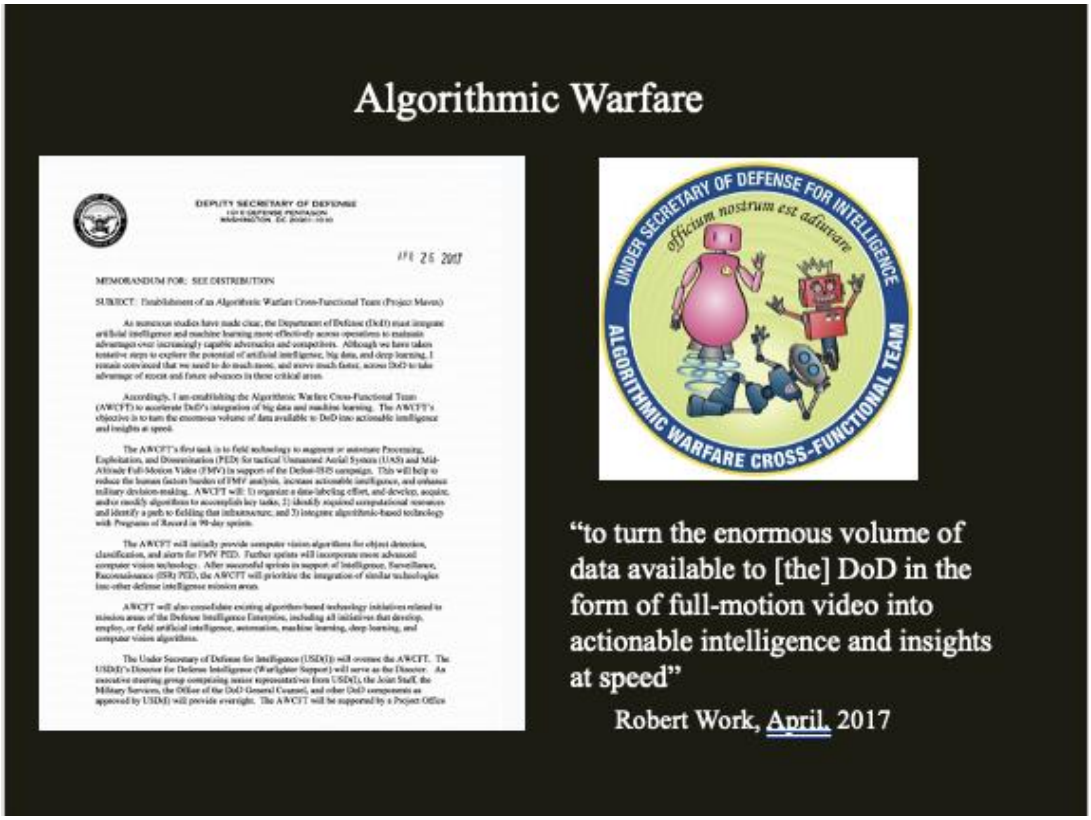
together by the dotted lines of electronic transmission. Finally, hovering along the bottom of the frame is the repository of doctrine and at the top the program's aim, that is 'The warfighting capability to sense, make sense, and act at all levels and phases of war, across all domains, and with partners, to deliver information advantage at the speed of relevance.' Cleanly bounded by its frame, the JADC2 placemat diagrams the dream of containment that characterizes modern martial epistemology.




For the US military, this martial epistemology can be traced back at least to US operations in Southeast Asia, articulated in 1969 by General William Westmoreland, then Chief of Staff of the US Army, who offered these thoughts over lunch:

"On the battlefield of the future, enemy forces will be located, tracked, and targeted almost instantaneously through the use of data links, computer assisted intelligence evaluation, and automated fire control. … I see battlefields on which we can destroy anything we locate through instant communications and the almost instantaneous application of highly lethal firepower. … With cooperative effort, no more than 10 years should separate us from the automated battlefield."

While the US effort to implement Westmoreland's fantasy in Vietnam was an infamous failure – this year marks as well as our decennial the 50th anniversary of the Unites States' military defeat in Southeast Asia – the project of data-driven omniscience and weapon systems automation lives on. Some fifty years later the US Department of Defense still presents this vision as an imminent reality. What *has* been realized in the present moment are infrastructures of surveillance far beyond the military's capacity to render the data generated as usable information. And it's there that the current promoters of algorithmic warfare find their opportunity.

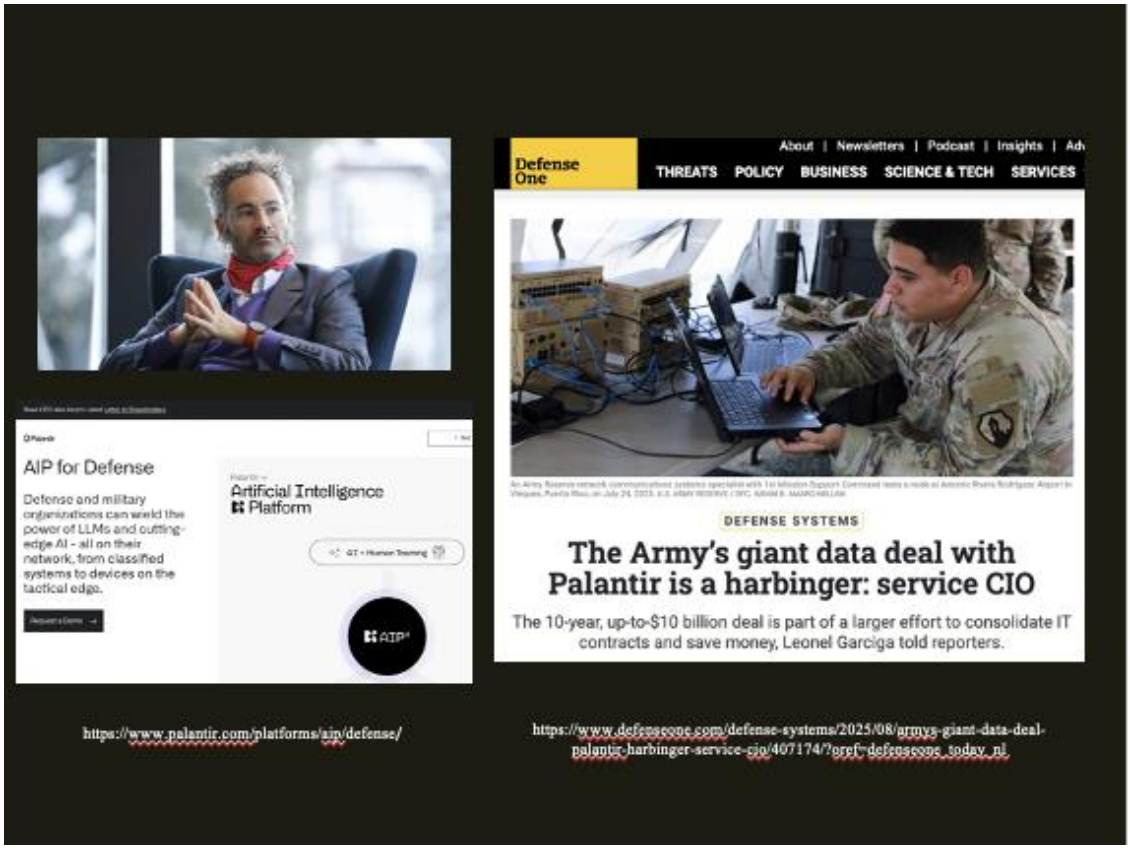



In April of 2017, the US Department of Defense announced plans for its flagship AI project, the Algorithmic Warfare Cross-Functional Team, code-named Project Maven and accompanied by this rather astonishing logo. The announcement of Project Maven by then Deputy Secretary of Defense Robert Work asserted the urgent need to incorporate artificial intelligence and machine learning across [DoD] operations. The plan as Work sets it out includes an initial project focused on the task of labelling data within full motion video generated by US drone surveillance operations. Project Maven's aim more specifically, Work states in his memorandum, is 'to turn the enormous volume of data available to [the] DoD in the form of full-motion video into actionable intelligence and insights at speed.'

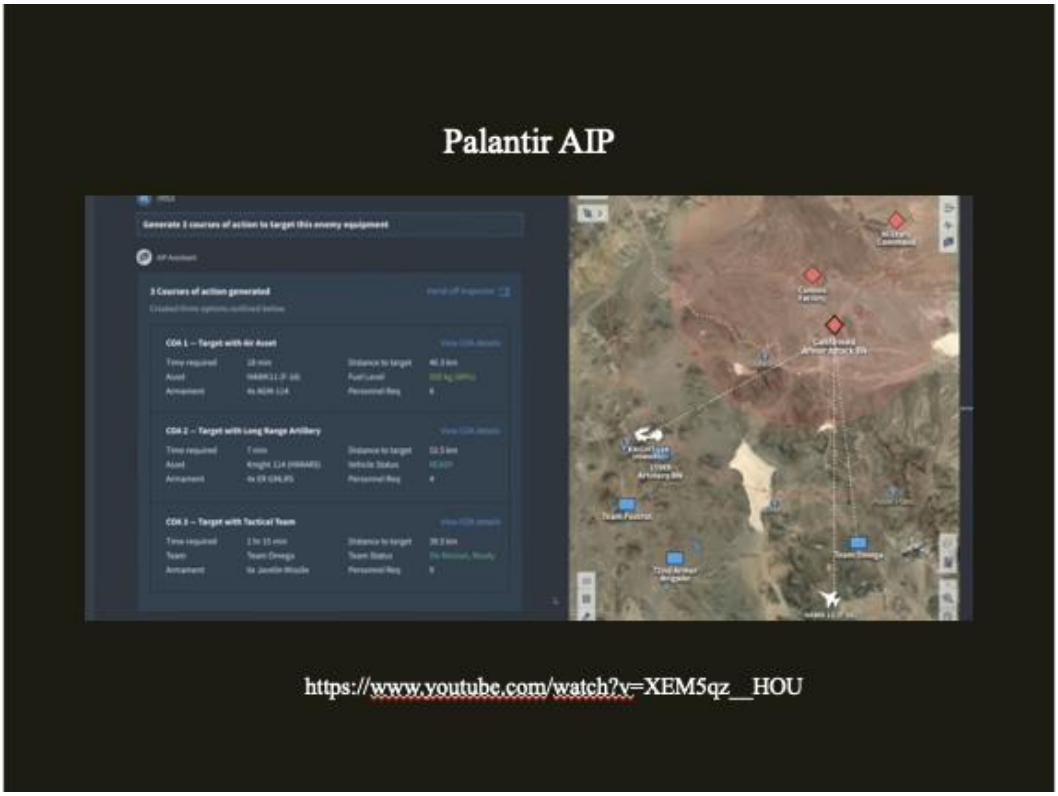

(Ethan Miller, Getty Images North America)

The media reports surrounding Project Maven overwhelmingly avoid the question of the criteria by which objects are identified as legitimate targets or imminent threats. We're told that 38 categories were used by those who hand-labeled 150,000 images to form the initial training data (Allen 2017), including the object 'an ISIS pickup truck' (Peniston 2017). This is in the context of US drone wars and the so-called war on terror: what we see here is a drone pilot's display in a ground control station, showing a truck from the view of a camera on an MQ-9 Reaper drone. The Reaper is a so-called "hunter-killer" unmanned aerial vehicle and is designed to engage what the military calls "time-sensitive" targets on the battlefield.

Project Maven raises the question of the correspondence between systems for the categorization of images of objects (in this case a truck) and how objects are incorporated into complex and changing relations and associated practices. As Gregoire Chamayou observed a decade ago in his book *A Theory of the Drone*, the claims for precision that justify new investments in automated targeting systems are based on a systematic conflation of the relation between a weapon and its designated target on one hand, and the identification of what constitutes a legitimate target on the other. No amount of improvement in the precision of targeting in the first sense can address the growing uncertainties of the second. This conflation is part of a campaign to deny the increasing reliance of these systems on ever more questionable forms of stereotypic profiling of what and who constitutes an imminent threat.

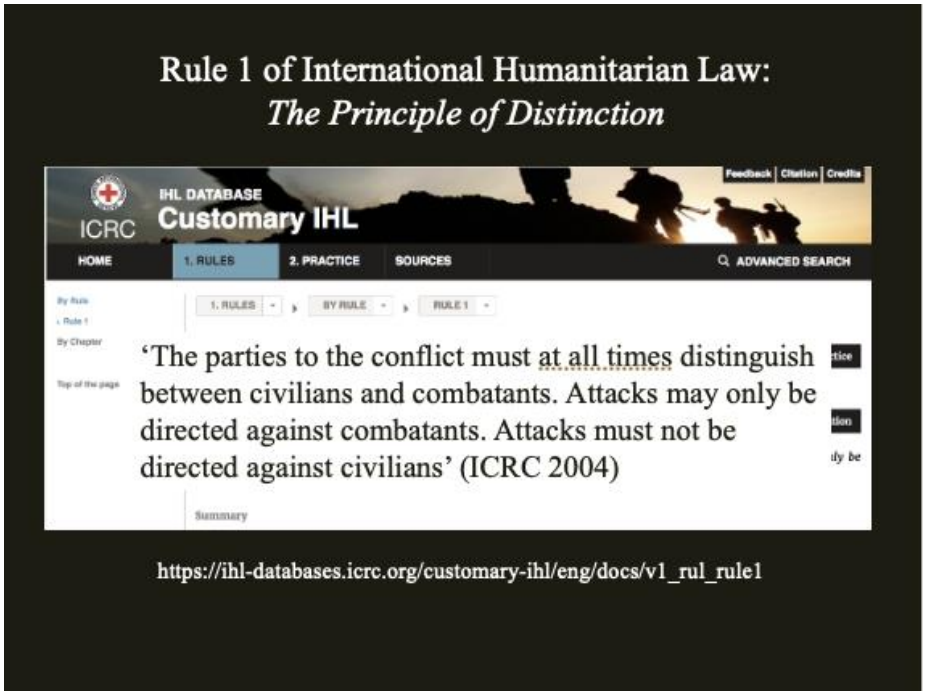



The primary developer of what is now named Maven Smart Systems is the company Palantir, led by self-satisfied master of digital war Alex Karp, who last month secured a $10 billion dollar contract with the US Army. Command and control in the moment of Generative AI is to be built on top of Palantir's AI Platform for Defense and Military, offering access to an LLM-based back end through a dashboard that includes a ChatGPT style conversational interface. Palantir assures its military customers that the platform has been designed to activate data and models 'from classified systems to devices on the tactical edge' to maintain a real time representation of the battlespace. Palantir also recently signed a deal for Maven Smart System NATO — that will support the NATO's Allied Command Operations strategic command.

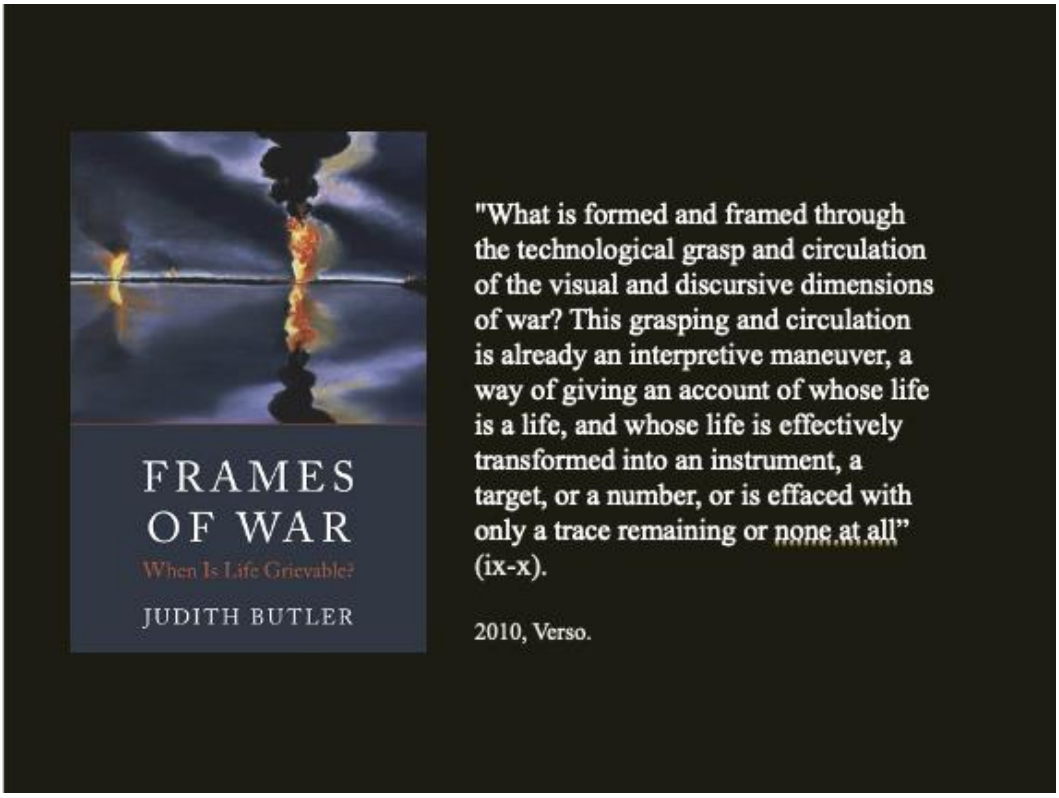



While little is publicly known about the current state and technical detail of Palantir's AIPlatform, the 8-minute promotional video demo that accompanied its launch in early 2023 gives us some insights into how the platform is envisioned to work in a warfighting setting. Not surprisingly, Palantir has chosen a scenario set in a battlefield strikingly like that of tank-based warfare in Ukraine, pitting friendly forces against enemy forces, featuring military units engaged in the operations characteristic of modern warfighting.

We might ask through what automated processes and human labours the 'real time' data on which the system depends are made and updated, and the data models refreshed? What are the 'ground truth' datasets for warfighting? And what are the implications and limits of the scenario chosen, with the tidy arrangement of forces in the battlespace and absence of non-combatants, as well as the unambiguous military status of its focal objects? What questions are left begging regarding the reliance of data models on the social sorting of good guys and bad, friends and enemies?



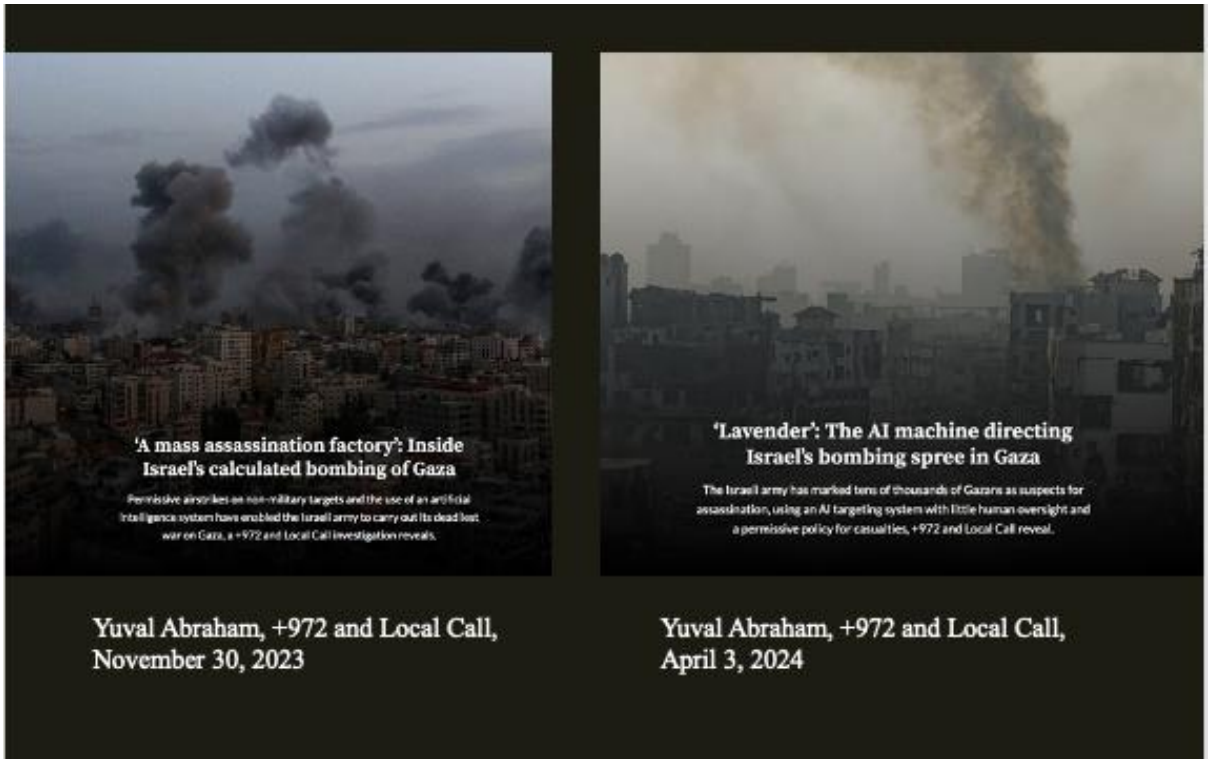

This matters to the legitimacy of warfare because those distinctions are at the foundation of International Humanitarian Law, where what differentiates murder from the legally acceptable taking of life turns on the Principle of Distinction between those who are in combat and pose an imminent threat, and those identified as civilians or otherwise out of combat. This is a principle that remains crucial as a resource for legal accountability in the face of its systematic violation in actual warfighting.




The AI Platform is an implementation of what Judith Butler has named the 'frames of war' that delineate the legitimate target along with a field of collateral damage (*Frames of War*, x). Butler asks:

"What is formed and framed through the technological grasp and circulation of the visual and discursive dimensions of war? This grasping and circulation is already an interpretive maneuver, a way of giving an account of whose life is a life, and whose life is effectively transformed into an instrument, a target, or a number, or is effaced with only a trace remaining or none at all" (ix-x).

We now have ample evidence that the automation of data analytics works to reproduce and amplify the classificatory schemas that inform the data set. And nowhere is this more treacherous than when the data set is made out of proxy signals, profiles and so-called patterns of life.




The frames of war created by data-drive targeting have become abundantly clear with the reported application of machine learning to targeting by the IDF in Israel's genocidal assault on Gaza. In a series of investigative reports published in the Israeli/Palestinian outlets +972 and Local Call, Israeli journalist Yuval Abraham has given us detailed accounts of two of the IDF's current systems, named respectively Habsora or 'the Gospel' and 'Lavender.'

The first report, published in November of 2023, draws on sources within the Israeli intelligence community who confirm that IDF operations in the Gaza strip sanction the bombing of built structures in densely populated civilian areas, including residential and public buildings. Official legal guidelines require that selected buildings must house a legitimate military target and be empty at the time of their destruction; the latter results in the IDF's issuance of a constant and changing succession of unfeasible evacuation orders to those trapped in diminishingly small areas of Gaza. Moreover, once Israel declares the entire surface of Gaza as a cover for Hamas tunnels, all of which are assumed to be legitimate military targets, the entire strip becomes fair game for destruction.

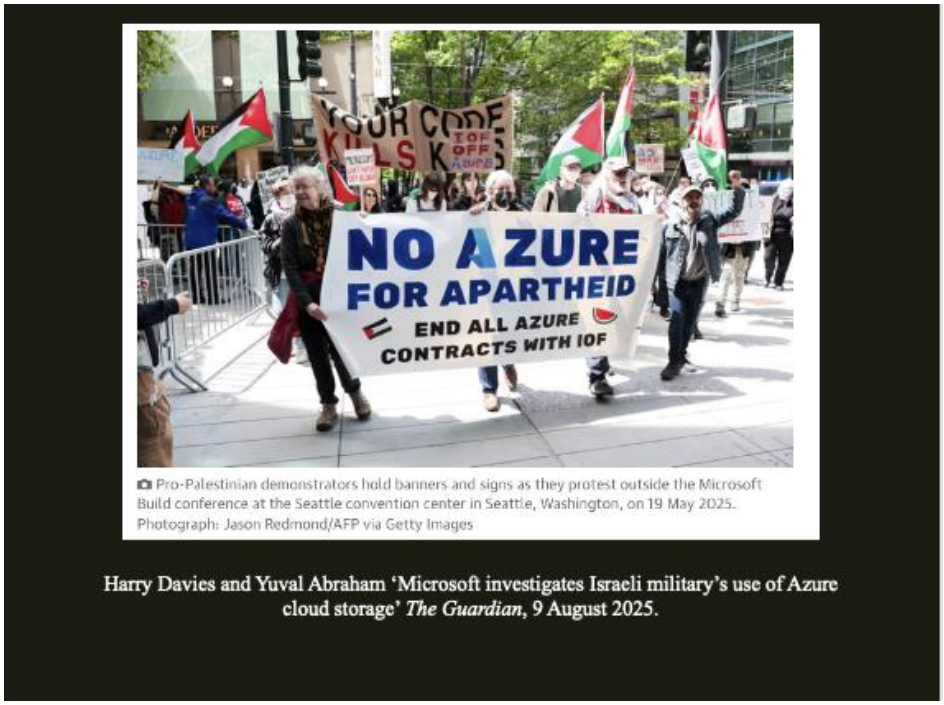
A direct corollary of this operational strategy is the need for an unbroken stream of candidate targets. To meet this requirement, Habsora is designed to accelerate the generation of targets from surveillance data, creating what one former intelligence officer (quoted in the story's headline) describes as a 'mass assassination factory'.

The second story, published in April of last year, describes the system named 'Lavender' dedicated to the targeting of individuals designated as suspected 'low level' Hamas or Palestinian Islamic Jihad militants. In the Occupied Territories surveillance includes massive amounts of aerial imagery (from satellites to drones), cell phone signals taken as proxies for location and movement, biometric registration at hundreds of check points including facial recognition systems, and monitoring of digital communications and social media for targeted names and keywords.

The training data for Lavender were reportedly based on 'features' correlated with known Hamas or PIJ fighters, from which all individuals in the population dataset were assigned a

score from 1-100. Based on these scores, the system marked some 37,000 people as probable militants and potential targets. The machine-generated targets were given only cursory review; one source explained that he would spend roughly 20 seconds to confirm that the individual was male, given the prohibition within Hamas and PIJ against women fighters.


Most notably, the Israeli bombardment of Gaza shifted the argument for AI-enabled targeting from claims to greater precision and accuracy, to the objective of accelerating the rate of destruction. Then IDF spokesperson Rear Admiral Daniel Hagari confirmed that in the bombing of Gaza "the emphasis is on damage and not on accuracy." For those who have been advancing precision and accuracy as the high moral ground of data-driven targeting, this admission must surely be disruptive. It shifts the narrative from a technology in aid of adherence to International Humanitarian Law (IHL) and the Geneva Conventions, to automation in the name of industrial scale productivity in target generation, enabling greater speed and efficiency in killing.




Pro-Palestinian demonstrators hold banners and signs as they protest outside the Microsoft Build conference at the Seattle convention center in Seattle, Washington, on 19 May 2025. Photograph: Jason Redmond/AFP via Getty Images

Harry Davies and Yuval Abraham 'Microsoft investigates Israeli military's use of Azure cloud storage' *The Guardian*, 9 August 2025.

More recently, as part of an ongoing investigation in collaboration with *The Guardian*, Abraham has been tracking the reliance of Israeli intelligence on Microsoft's Azure platform for cloud storage to enable processing of the mass surveillance data used to identify bombing targets in Gaza and to detain or kill Palestinians in the West Bank. In the light of these stories, Microsoft has had to walk back claims issued in May that there was "no evidence to date" that Azure had been "used to target or harm people" in Gaza. Whether and how these revelations will affect Microsoft's ongoing relations with the IDF is up to activism by the media, techworkers, activist shareholders and others working against the computational enablement of genocide.

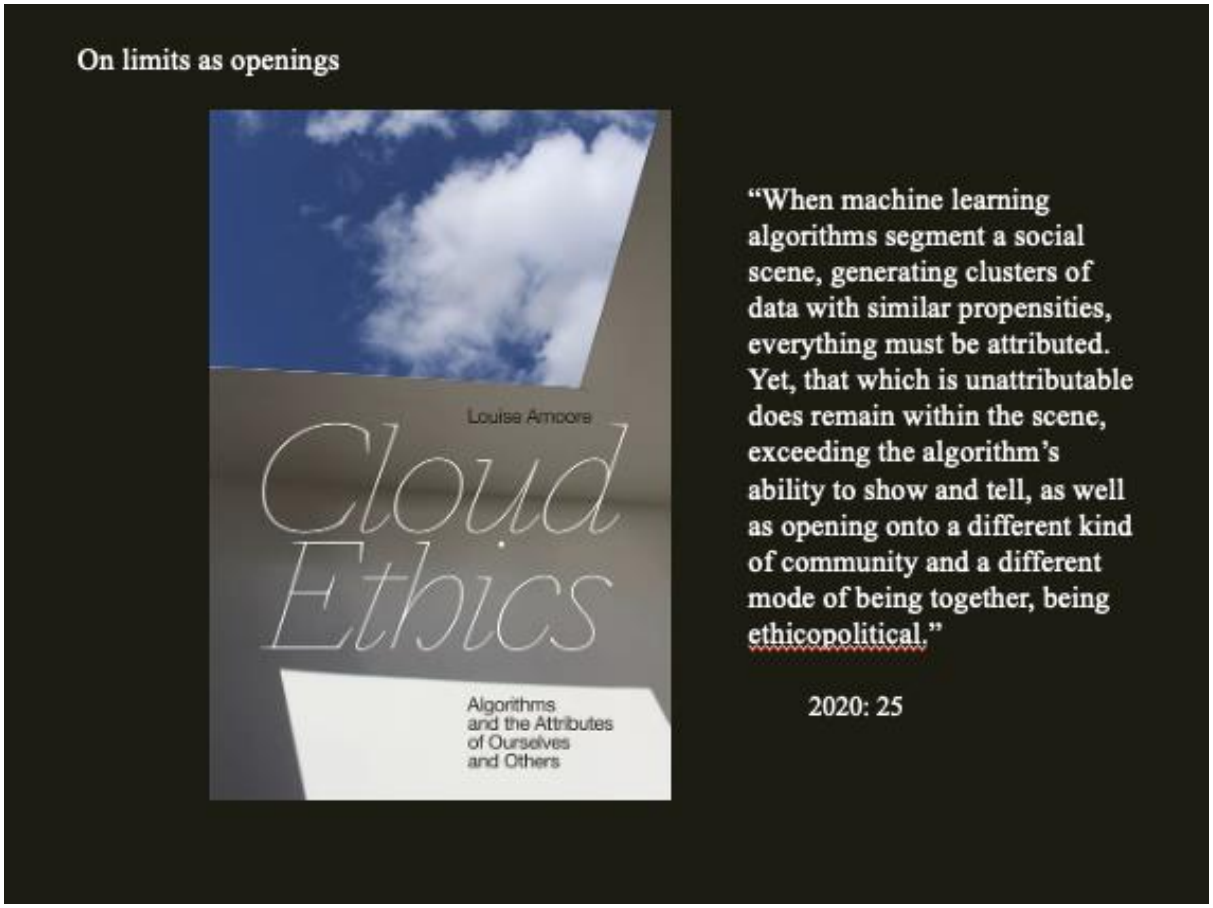
In the company of No Tech for Azure at Microsoft, refusal is the animating spirit for No Tech for Apartheid, another collective that joins together labour with anti-militarism. No Tech for Apartheid describe themselves as “a worker-led campaign of Google and Amazon workers organizing against their companies' $1B Project Nimbus cloud computing contract with the Israeli government and military.”


So what would it mean to co-design innovations in peacemaking? I offer as examples two, interconnected social movements arising in and in relation to Israel/Palestine, the coalition named Combatants for Peace, the other the Jewish Voice for Peace, who describe themselves as a grassroots, multiracial, cross-class, intergenerational movement of U.S. Jews.

The message is a simple one at one level, but unfathomably complex on another; that the only way to peace and reconciliation is to be able to hold together feelings of rage, even hatred, with feelings of compassion and forgiveness. And the only way of doing this is through relationships built over time, knowing the Other until they cease to be that and become familiar, and recognizing the rights of all to live together in the territory now named Israel/Palestine.


These grassroots groups have recently been joined by a creative response to the inaction of the United Nations, The Hague group led by Colombia and South Africa. As they write on their website:

"The choice is stark: Either we act together to enforce international law or we risk its collapse. We choose to act, not only for the people of Gaza but for the future of a world where justice prevails over impunity. Let this moment mark the beginning of a renewed commitment to internationalism and the principles that bind us as a global community."



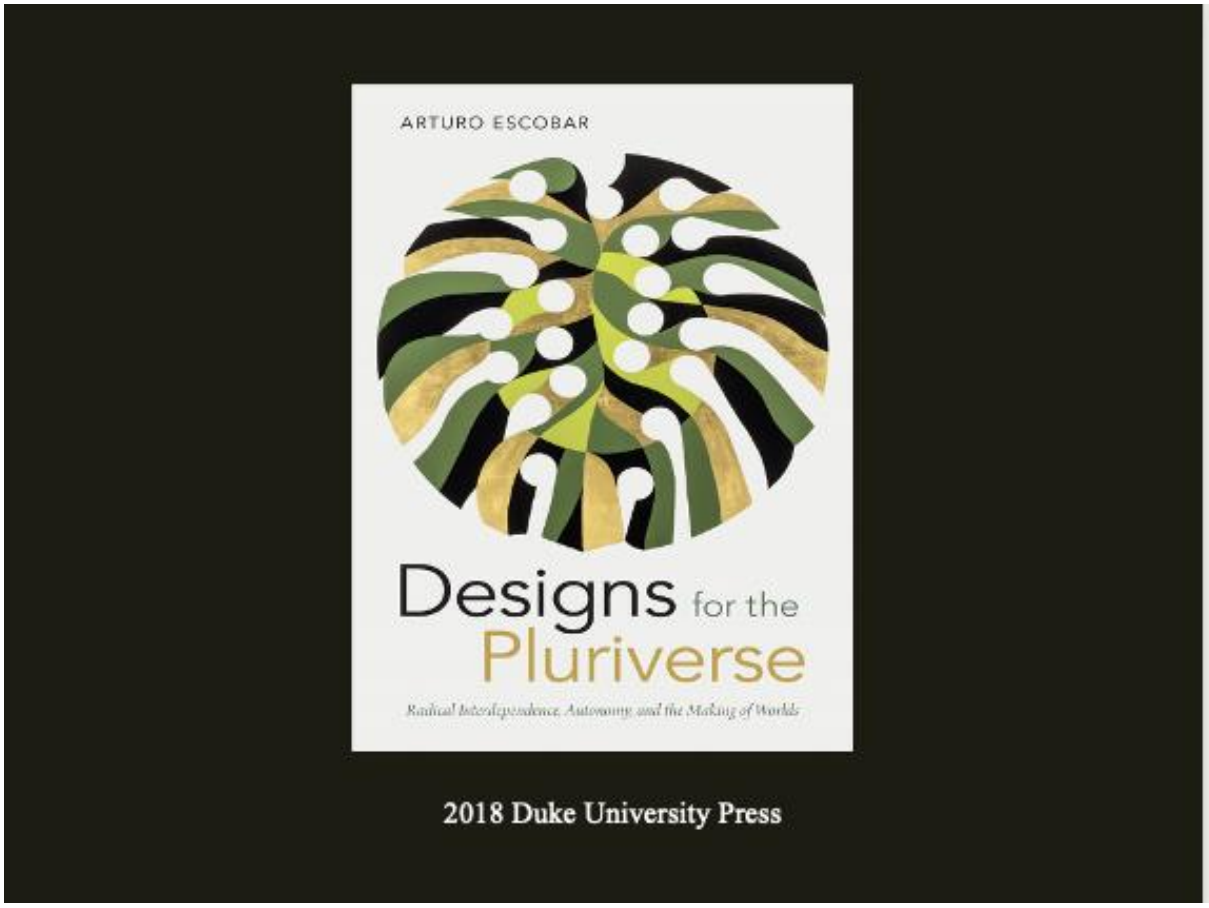

In closing, let me return to the beginning and the idea of the limits of computing as an opening for resistance and reimagining. While the apparatuses of militarism are pervasive, their closure is never complete. The question then is how the containment that enables the military machine, and marginalizes or erases its constitutive outsides, can be interrupted.

In her book *Cloud Ethics*, Louise Amoore insists on the resilience of that which escapes datafication as a resource for resistance when she writes:

'When machine learning algorithms segment a social scene, generating clusters of data with similar propensities, everything must be attributed. Yet, that which is unattributable does remain within the scene, exceeding the algorithm's ability to show and tell, as well as opening onto a different kind of community and a different mode of being together, of being ethicopolitical' (25).

The different kind of community required for cloud ethics requires recognizing that data are made, not mined. Demystifying algorithmic machinery requires recognizing that it is always and irreplaceably humans whose classificatory practices render data meaningful. Which brings us back to the politics of energy and labour on which automation depends, including the labour of those who might assert their power to bring the machinery of algorithmic intensification to a stop.


In Directions for Future Work, scholar activist Sasha Costanza-Chock highlights the throughlines from collectives gathered under the hashtag Tech Won't Build it to an agenda of design justice. Those allied with Tech Won't Build It make clear the relations between refusal as a positive act of collective resistance, and the work of reimagining design. They loop us back to the initiative launched at Aarhus 1975 fifty years ago, reimagining design relations and practices in service of labour and social justice.




Design justice moves toward Arturo Escobar's call for *Designs for the Pluriverse*, where co-design is understood as a politics of transformative change. Escobar foregrounds projects led by autonomous communities and social movements in Latin America and the global South, as radical alternatives to the colonial legacies that haunt rationalist, modernist design in its progress toward an unsustainable and unequal future. Remaking design and remaking worlds are conjoined projects here, which require recognizing the relations between design as an arena of professional practice and co-designing as a mundane, ubiquitous practice of everyday life. The crucial question – raised in the earliest days of the collective gathered here now, becomes one of who designs with and on behalf of whom. The aim is not to somehow extend design to a terra nullius of marginalized actors, but rather to trouble the thing that 'design' in the professional sense has become, destabilizing the boundaries of professional design so that new knowledge practices and alliances become possible to us as designers, and recognizing with due humility the plethora of designing that is always already ongoing and that exceeds and overflows that which any of us alone can imagine.