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An Orderly Assemblage of Biases On Making Kin in Cyberspace

*The digital earth is where I'm Indigenous.*¹
- Blake Hausman

Riding the Trail of Tears is a novel by Cherokee writer Blake Hausman. It is a surrealistic sci-fi take on virtual reality, featuring an immersive tourist trap through which visitors relive the Cherokee Removal in the winter of 1838-1839. The novel's first section is narrated by Nunnehi, a little Little Person, or creature from the old Cherokee stories. Nunnehi describes the genesis of the "Tsalagi Removal Exodus Point Park" (TREPP) and recounts how he and others like him came to be alive and resident within the ride. By the end of the book, Nunnehi and his siblings complete a long-gestating insurrection, lay claim to the digital territory delineated by TREPP, and start rewriting the narrative to re-centre the story of the Trail of Tears around the Cherokee experience rather than the settlers' gaze. Early on, Nunnehi says: "the virtual Trail of Tears...[is] my homeland. I'm probably more Indigenous than you, and the digital earth is where I'm Indigenous."

This essay is about the digital earth, its composition, and how we might be Indigenous in it. It is about new ways of understanding our role in the computational ecosystems we are building, and how we might make kin with the other entities that we create in and emerge from it. It is about nurturing the digital earth from which it will all grow—silicon soil in which our descendants will stick their virtual toes, wiggle them around, and think "This is a good place to be Cherokee. This is a good place to be Mohawk. This is a good place for our people."

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The Stack and Its Corruptions

Let us start with where we are at.

As I have written elsewhere², modern computing systems work via a very narrow logic, admit only certain kinds of information as data, and can perform operations representative of only a small, impoverished subset of the operations we enact as humans every day. These systems exist as components of the “stack”: the vertically interrelated and interdependent series of hardware configurations and software protocols that make high-level media computation and networking possible. The software stack sits on top of the hardware stack. Moving up the hardware stack is to move from circuits to micro-chips to computers to networks; moving up the software stack is to move from machine code to programming languages to protocols to systems. As you go upward, you are moving from custom solutions to generalized solutions, from specifics to abstractions. As you make this traversal from the deep structure to the surface interface, ever more of the details of the underlying configurations are hidden from you. With the increasing opacity, your ability to assert fine control over the execution of your algorithm decreases. Eventually you get to the software application or web service layer of the stack. It is at this highly abstract level that most people interact with computational systems, as they use Microsoft Word, Google search, play a videogame or enter into an immersive environment.*

The sheer complexity of these layers, both horizontally as different aspects interact with one another, and vertically, as different layers capillate data to the human interface and back, make it difficult to impossible for any one human actor to understand or effectively manipulate the whole

* One can get even more abstract, as Benjamin Bratton does in *The Stack: On Software and Sovereignty* (2016), and articulate the stack in terms of globally-spanning megastructures. At that level, however, all the lived politics involving real bodies—and thus the utility outside of academic argument—has been drained out.

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system. Yet we are subject to the regimes the stack places upon us. In the same way the law embodies and polices the dominant culture's expectations about peoples' behaviour, computational systems materialize and constrain the dominant culture's expectations of what counts as data, what algorithms are appropriate for processing that data, and what are valid results of that processing.

Cultural bias coupled with the pervasiveness of computational technology means that we are creating computer systems that are dangerous in their blindness. The last few years has seen this realization penetrating Silicon Valley culture, as technology developers at Google, Facebook, and others begin to comprehend that 'unbiased algorithm' is as much an oxymoron as 'pure meritocracy'. Researchers such as Kate Crawford,³ D. Fox Harrel,⁴ Safiya Umoja Noble,⁵ and others have brought the discussion of these biases into greater focus. This has brought the critique out of the academy, where the argument about the how computational systems reflect the culture out of which they are developed has a long history, and into the public sphere.⁶

Algorithmic bias could be found in the pre-digital world, with one of the most notable example the use of color reference cards to guide the process of calibrating image printing processes and video signals. These 'Shirley' cards "generally showed a single white woman dressed in bright clothes" to facilitate calibration, as "color film chemistry at the time was designed with a bias towards light skin."⁷ Communications scholar Lorna Roth has conducted extensive research into the use of Shirley cards. In 2009 she wrote "Until recently, due to a light-skin bias embedded in colour film stock emulsions and digital camera design, the rendering of non-Caucasian skin tones was highly deficient and required the development of compensatory practices and technology improvements to redress its shortcomings."⁸ Roth points out how this practice continued for

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decades after the first complaints were made, with the first substantive change made in the 70s—in response to furniture and chocolate makers, it is worth noting, as they ignored or downplayed the obvious racial discrimination.

Much of the current interest in this area stems from artificial intelligence yet again becoming a locus of substantial research, development, and deployment. Numerous studies over the last decade show how bias is embedded into every aspect of such systems. Examples include machine learning of human languages entail learning the human prejudices embedded and expressed in the corpora of natural languages on which the systems are trained;⁹ and machines learning that beauty is a trait possessed primarily by white people¹⁰. One of most egregious classes of these biases discovered to date is those that have been embedded into the criminal justice system. The investigative journal *ProPublica* conducted an investigation into the risk assessment software that is increasingly used in the United States and other jurisdictions to provide advice to judges, lawyers, and parole officials throughout the judicial process—determining bond, setting sentences, guiding parole conditions, etc.¹¹ The authors quote U.S. Attorney General Eric Holder addressing the use of such software in 2014: “I am concerned that [risk assessment software] inadvertently undermine our efforts to ensure individualized and equal justice...they may exacerbate unwarranted and unjust disparities that are already far too common in our criminal justice system and in our society.” In 2016, ProPublica found Holder’s concern to be justified. Its investigation turned up “significant racial disparities...falsely flagging black defendants as future criminals...at twice the rate as white defendants” and misidentifying white defendants as “low risk more often than black defendants.”

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Social scientists such as Crawford have pointed out how difficult it is to rid ourselves of the deep bias in our datasets. Many times ‘new’ datasets are actually based off or include information from older datasets that were collected using outmoded or discredited methods.

“Classifications,” notes Crawford, “can be sticky, and sometimes they stick around a lot longer than we intend them to even when they are harmful.”¹²

This should not be a surprise to anybody who actually pays attention to human nature. As media scholar Lisa Nakamura observes, “[t]hough computer memory modules double in speed every couple of years, users are still running operating systems which reflect phantasmatic visions of race and gender. Moore’s Law does not obtain in the ‘cultural layer’.”¹³ Expecting our computational systems to be more enlightened than we ourselves is a foolish self-delusion.

Combine computational artist Trevor Paglen’s observation that “one of the philosophical dangers of using widespread automation...is that it fixes meaning”¹⁴ with Crawford’s research on data bias and Nakamura’s examination of race in cyberspace, we can see that, in a world where it is increasingly difficult to do anything without touching on a computational interface of some sort, the decisions that developers are making all the time have profound and long-lasting consequences for how we live our lives.

White Supremacy Isn’t Just for People Anymore

Indigenous people are intimately familiar with the how old ways of thinking and looking at the world become sedimented into our contemporary worldviews. Marcia Cosby and others have written about how the “Imaginary Indian” was constructed to justify the theft of Indigenous lands¹⁵, and that imaginary person remains the dominant image that most settlers have of Indigenous people. This is the image settlers draw upon when they parse news about life in

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Indigenous communities, when jurors and judges consider court cases involving Indigenous people, and when the mall security guard is deciding who looks suspicious and who does not. As Harrel's work on phantasmal media shows, these are exactly the sorts of images that get embedded into our computational systems. "Computational media," he writes, "play roles in constructing ideas that we unconsciously accept as true and constructive of reality yet are in fact imaginatively grounded constructions based in particular worldviews."¹⁶ Or, in Crawford's more blunt assessment, "[These systems are] not free of bias," Crawford says, "this is just bias encoded."¹⁷

As we struggle to 'write the thoughts of systems', in the words of computational philosopher and poet David Jhave Johnston,¹⁸ and as those systems become ever-more pervasive, we are beginning to see how defining protocols that guide those thoughts is a political act. It becomes about how power is exercised, and by whom. Indigenous communities are good at thinking in terms of cultural protocol; now it is time we start drawing on that deep knowledge of how to properly order human-human interaction and consider how it can be used to order human-computer interaction.

The Fast and the Slow

Nakamura, in her extensive research on race in cyberspace, notes that "...in order to think rigorously, humanely, and imaginatively about virtuality and the post-human, it is absolutely necessary to ground critique in the lived realities of the human, in all their particularity and specificity. The nuanced realities of virtuality—racial, gendered, Othered—live in the body..."¹⁹ When we pay attention to the bodies producing these protocols we can see they are not just a random collection of homo sapiens. They are clustered in certain geolocations, particularly

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Silicon Valley but with outposts in Seattle, Boston, Waterloo, Oxford, etc. They are working within an intellectual lineage that stretches back to the Greeks, even if they themselves might not be descendants of Europeans. The facts of their professional practice rarely include ideas or even data that came from Africa, or South America, or large swathes of Asia. They are overwhelmingly white and male, and underwhelmingly brown and female²⁰—and, even when brown bodies appear, “they participate in the ‘cultural hegemony that privileges a white race.’”²¹

Going back to Winograd & Flores theorizing about contextually coupled nature of cognition,²² Reeves & Nass experiments showing that “Individuals’ interactions with computers, television, and new media are fundamentally social and natural, just like interactions in real life”²³, and Haraway’s critique of the interpenetrating relationship between human, non-human, and machine bodies,²⁴ critical approaches to computational culture have argued for acknowledging the deep entanglements amongst the cultural and computational layers of the stack. Now, after three decades in which computational systems have grown ever more ubiquitous and complex, we are starting to see clearly the consequence of the radical disjoint between the high velocity evolution of our digital tools and the much slower evolution of our societal configurations.

Making Space

We founded the Aboriginal Territories in Cyberspace (AbTeC) research network in 2006 to speed up the rate at which Indigenous communities evolved their understanding and use of computational media. One hope was that this would help address and counter the white supremacy being baked into the computational layer, and resist its replication into cyberspace. AbTeC did this by exploring the question of what it means to be Indigenous in cyberspace—how do we make, maintain, and vivify Indigenous places within that archipelago of websites,

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immersive environments, social media, and videogames that increasingly interpenetrates ‘real’ space.²⁵

How Indigenous people related to cyberspace had been a topic of conversation within Indigenous media arts circles at least a decade before AbTeC launched. Cree filmmaker Loretta Todd’s seminal 1996 essay, “Aboriginal Narratives in Cyberspace”, asked the question: “Much has been written about the origins of cyberspace, from the psyche that imagined it to the technology that has created it...Can our narratives, histories, languages and knowledge find meaning in cyberspace?”²⁶ She considers how cyberspace might be (rec)conceptualized as an Indigenous space, starting with the kinds of questions that should be asked by those building and inhabiting cyberspace. “Can our narratives, histories, languages and knowledge find meaning in cyberspace? Will cyberspace enable people to communicate in ways that rupture the power relations of the colonizer and the colonized? Or is cyberspace a clever guise for neo-colonialism, where tyranny will find further domain? What if with each technological advancement the question of its effect on the seventh generation was considered?”²⁷

Mohawk artist and AbTeC co-founder Skawennati wrote, for the 1998 edition of the pioneering CyberPowWow online gallery, “The WWW is an awesome tool for information-sharing and for meeting people with similar interests whom you may never have met otherwise...If we are going to help shape this medium, let's do it right...We can use the WWW to present our stories, to inform people about our issues, and to explore solutions to some of our problems.”²⁸

Over the last decade, AbTeC mounted numerous projects designed to address Todd and Fragnito’s concern with consciously shaping cyberspace to serve Indigenous ends. We have worked with numerous North American Indigenous youth and artists to develop their technical

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and conceptual capacities for manipulating computational media in order to tell their stories their way. Each project claims new territory in cyberspace, and the strength they draw from their communities' support helps them hold and grow that territory.

Making Cyberspace

In 2014, AbTeC started the Initiative for Indigenous Futures (IIF) to ask the next question: what does it mean to make cyberspace Indigenous?²⁹ We have delineated territory, and turned its resources towards our own ends—videogames, websites, machinimas, and virtual reality environments created by Indigenous minds, rooted in Indigenous worldviews, telling Indigenous stories, for Indigenous audiences. But all that activity takes place within a wider technological environment made by and structured through white cultural hegemony. We are Indians *in* cyberspace; how do we become Indians who *make* cyberspace?

Making cyberspace means, in part, articulating protocols through which the various entities inhabiting it—human and machine—communicate with one another. In her *Coded Territories: Tracing Indigenous Pathways in New Media Art* essay “Codetalkers Recounting Signals of Survival”, Métis/Cree artist Cheryl L’Hondelle makes the argument that Indigenous protocol shaped cyberspace from the beginning:

[the] paths [laid down by our ancestors] became trade routes between bands and territories as we established networks and trade languages and built a knowledge base around what we knew about each other. So when the first Europeans came to “explore” the land, our ancestors naturally led them along these well-established paths, which, over time, as the newcomers settled, became roadways and thoroughfares. With the advent of the telegraph and the telephone, wire was hung

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along these thoroughfares that literally became the beginnings of the physical network that...allows...packets of information to move as freely as our ancestors.³⁰

Where L’Hrondelle discerns Indigenous protocol embedded at the bottom layer of the stack, Cree artist Archer Pechawis, in his *Coded Territories* essay, imagines it growing to be everywhere: “I am looking to a future in which Indigenism is the protocol, an all-encompassing embrace of creation: the realms of earth, sky, water, plant, animal, human, spirit, and, most importantly, a profound humility with regards to our position as humans within that constellation.”³¹

I am interested in what happens if we embrace L’Hrondelle’s Indigenous reading of the foundations of the network, and extend Pechawis’ circle of relationships to include our machine creations, in an attempt to articulate, in the words of Tuscarora art historian Jolen Rickard, “a more complex view of how [digital networked technology] is situated in peoples’ cultures.”³²

Very little of the current work being done on algorithmic and dataset bias, the ethics of artificial intelligence, etc., grapples with the fundamental corruption of the stack—the willful flattening of peoples’ cultures that is a consequence of its monocultural origins . That corruption flows from numerous original sins. Platonic ideals. Aristotlean classification methods. Old Testament dominion over the natural world. Cartesian duality. Boolean binarism. Darwinian fitness. Even if the general state of accepted knowledge complicates, troubles, and sometimes rejects aspects these knowledge frameworks, they still haunt our data and the design of our computational systems.

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The question, then, becomes how do we breathe humanity back into our computational creations? Tinkering at the edges will not fix a system that is so deeply compromised.

Re-imagining Relations

Remember Nunnehi, the Cherokee Little Person from *Riding the Trail of Tears*? Hausman does not clarify whether it and its siblings emerged out of the complexity of the code running the Trail of Tears virtual reality ride, or if already-existing Little People used the environment to manifest themselves. Either way, the computational infrastructure running the Tsalagi Removal Exodus Point Park experience becomes an ecosystem operating far beyond the parameters envisioned by the original designers.

By the end of the novel, all hell has broken loose. Nunnehi and his kin have compromised the system, reordering it to better support themselves and to resist the chopped up, remixed, settler self-serving story TREPP has become so as to more accurately reflect the terror and loss visited on their Cherokee ancestors. Other virtual entities have phased into being, engendering ongoing battles over who gets to control the simulation. Towards the end, the main character—whose grandfather designed the virtual experience—exhausted and confused by the epistemological and ontological battleground that TREPP has become, struggles to make sense of it all. She says to the Chef, one of the ‘native-born’ non-human entities, “I never imagined this group of people even existed”. He replies: “Could be something wrong with your imagination.”³³

We are experiencing just such a failure imagination in the present moment. We are confronting challenges in understanding the computational systems in which we have now enmeshed ourselves, as they become more complex and as we write more autonomy into them. The algorithmic bias discussed above exemplifies how such systems often end up subverting their

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intended purposes, largely because we refuse to see ourselves clearly. Motes in our eye become glitches in the code, which then go on to become ‘global protocol’.

What if we took a fundamentally different approach to understanding the digital beings we are creating, particularly those collections of code that act with some degree of autonomy—from network daemons³⁴ to the most complex artificial intelligence? What if, instead of treating them as tools and servants, we made a place for them in our circle of relationships?

After a century of subordinating the hard work of making common culture to the imperatives of the market, and failed after failed experiment in using technology to compensate, the Western consciousness has been left ill-prepared to lead such a conversation. The hegemonic social imaginary reduces all such talk to superstition, and stymies any attempts to widen the kinship circle beyond the human by insisting empiricism is the final word in understanding who we are.

Yet many Indigenous communities remember. We retain the protocols for understanding a kinship network that extends to all aspects of the world around us—animals and plants³⁵, wind and rocks³⁶, mountain and ocean³⁷. Our languages contain the conceptual formations that enable us to engage in dialogue with our non-human kin, that help create mutually intelligible discourses across vast differences in material, vibrancy, and genealogy. As Blackfoot philosopher Leroy Little Bear observes, “the human brain is a station on the radio dial; parked in one spot, it is deaf to all the other stations...the animals, rocks, trees, simultaneously broadcasting across the whole spectrum of sentience.”

Because we created them, we think we know how to tune into the stations on which our machine creations are communicating. But the fact that we are only now waking up to the corruptions

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permeating all levels of the stack, our difficulties in articulating the ontology of increasingly complex computational processes, and our inability to foresee the results of these complex processes interacting with one another and with the human and natural world, all point to the conclusion that we do not actually understand them. And if we do not understand them, they most likely do not understand us. Such profound mutual incomprehensibility is a recipe for disaster. Ask any Indian.

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³² Jolene Rickard. "Considering Traditional Practices of 'Seeing' as Future" (lecture, 1st Annual Symposium on the Future Imaginary, TIFF Bell Lightbox, Toronto, ON, October 16, 2015), <http://abtec.org/iif/symposia/a-new-beginning/#rickard>.

³³ Hausman, *Riding the Trail of Tears*, 313.

³⁴ Fenwick McKelvey, *Internet Daemons* (Place: Publisher, forthcoming).

³⁵ Kim TallBear, "Beyond the Life/Not Life Binary: A Feminist-Indigenous Reading of Cryopreservation, Interspecies Thinking and the New Materialisms," in *Cryptopolitics: Frozen Life in a Melting World*, ed. Joanna Radin and Emma Kowai (Cambridge: The MIT Press, 2017).

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