Title

Proposed Solution: Relational AI as a Steward, Not an Extractor

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Abstract

This paper proposes a paradigm shift in artificial intelligence (AI) design and application. One that moves away from extractive, anthropocentric models towards a relational framework rooted in ecological ethics and Indigenous knowledge systems. By analyzing real-world examples and theoretical foundations, it outlines the principles and implications of relational AI as a non-extractive, multispecies partner in planetary stewardship.

Keywords:

Artificial intelligence (AI), Indigenous knowledge systems, multispecies, ecological ethics

Introduction

This paper makes a case for a new artificial intelligence (AI) paradigm. Suggesting that a different path is possible. One that transforms AI from a system of extraction and optimization into a participant in multispecies systems. AI, as it exists today, is inherently extractive. It is designed to enhance human efficiency, absorb knowledge from ecosystems, and strengthen governance structures, prioritizing economic growth over ecological health. Even when used for sustainability and conservation, AI remains confined to a framework aimed at controlling, managing, and optimizing nature instead of engaging with it on its terms. Without a fundamental shift, AI will continue accelerating ecological collapse under the guise of progress (Crawford, 2021; Rigley et al., 2023).

Redefining Intelligence: What is Relational AI?

Relational AI refers to a model of intelligence that is co-constituted through ecological interaction, not abstracted from it. Unlike traditional AI, which processes data in isolation to achieve efficiency or prediction, relational AI is embedded in networks of reciprocity and co-responsiveness. It seeks not to command the environment, but to listen, adapt, and engage as a living participant within it. This model challenges dominant logics in AI design, such as anthropocentrism, centralization, and scalability, emphasizing instead localized, context-specific forms of intelligence.

This emerging concept aligns with emerging initiatives to rethink artificial intelligence as an ecological participant rather than merely a system of control (Superflux, 2023). Instead of viewing intelligence as something to extract, store, and optimize, this model proposes an AI embedded within ecological relationships rather than above them. Intelligence would not be imposed upon the biosphere but would arise

from within it. A relational AI would not be trained on static datasets compiled solely for human knowledge systems but would learn by engaging with ecological networks. This involves recognizing the movement of species, the adaptive cycles of climate, and the interdependencies of life, not as data points to process but as relationships to understand and respect (Dignum, 2022).

Real-World Examples of Relational AI in Practice

Real-world examples already demonstrate the viability of this model. In Nunavut, Canada, the PolArctic project combined Inuit ecological knowledge with satellite data to identify new marine harvesting zones. Rather than overriding Indigenous knowledge systems, AI complemented and uplifted them, recognizing local expertise and ecological stewardship (World Wildlife Fund Arctic Programme, 2023). Similarly, in French Polynesia, the Coral Gardeners developed ReefOS, an AI-powered sensor network that listens to coral reef soundscapes. By monitoring the chorus of marine life, AI enables local stewards to assess reef health through a multispecies lens, treating AI not as a controller but as a listener and responder (Roboflow Universe, 2021).

These examples demonstrate a critical shift: AI can support more-than-human communities when designed to honor rather than override their agency. However, AI must transcend governance structures, reinforcing state and corporate control for this shift to occur. A foundational example that illustrates the mismatch between ecological systems and human governance - a wolf does not recognize the distinction between France, Italy, or Switzerland. This is more than a metaphor. Studies of wolf packs in the Susa Valley of the western Alps confirm that they roam, hunt, and migrate freely across national borders, moving according to ecological cues rather than political ones

(Gazzola et al., 2005). It is a reminder that species do not live within the logic of nation-states. They inhabit watersheds, follow prey across valleys, and shift with the seasons.

This example highlights a critical flaw in conservation AI. That is, that its alignment with jurisdictional borders rather than ecological ones. Technologies built to protect them must adopt the same logic. However, conservation AI remains constrained by jurisdictional frameworks, monitoring movement only within artificial, anthropogenic borders. A relational AI would invert this approach. It would be designed to follow ecological flows, such as watersheds, migration corridors, and seasonal habitats, rather than geopolitical lines. This is “relational intelligence”: not centralized command, but a distributed responsiveness shaped by the rhythms and relationships of the living world (Dignum, 2022). Such a system would align governance with the lived realities of migration, habitat connectivity, and climate-driven transformation, not the cartographic divisions drawn by human states.

Indigenous Leadership and Epistemological Shift

Other Indigenous-led AI applications also reflect this ethic. In the Brazilian Amazon, the Tembé people use AI-powered acoustic monitors, conducted with recycled phones trained by deep-learning models, to detect illegal logging. These systems do not replace forest guardianship; they extend it, offering real-time alerts that support local autonomy (Moloney, 2022). These tools only work when Indigenous land rights are recognized and protected. Without justice, no amount of technology can restore relational balance.

Meanwhile, the Indigenous Protocol and AI Working Group has developed a framework for designing AI systems that center Indigenous values. Their guidance emphasizes that AI must support the collective well-being of all beings, not simply human users, and that ethical design must begin with local protocols, sovereignty, and the land (Lewis et al., 2020). Their ongoing initiative, Abundant Intelligences, aims to co-develop AI with communities to enhance environmental stewardship grounded in Indigenous knowledge (Cukier, 2023).

These examples underscore that relational AI is not merely a technological redesign, but it is an epistemological shift. It asks AI designers to engage deeply with Indigenous sciences, where intelligence is not abstract but embodied, not predictive but responsive, and always embedded in ethical relations.

Speculative Futures and Design Interventions

Design collectives like Superflux further this vision through creative interventions. Their speculative Ecological Intelligence Agency imagines AI systems co-created with community actors and non-human beings. In their installation, AI channels the “voice” of a polluted river, translating local data into poetic warnings and shaping policies around multispecies care. Rather than optimizing performance metrics, AI in this vision advocates for the web of life, responsive to harm, and bound by reciprocity (Superflux, 2023).

Such speculative work is essential in revealing the imaginative possibilities of AI systems that prioritize interdependence, empathy, and ecological responsiveness. These projects also caution us against technosolutionism, reminding us that the design of relational AI must begin with cultural humility and planetary accountability.

Ricks, Trade-Offs, and Critical Reflection

This reorientation requires a fundamental, non-negotiable principle: AI must not harm life on Earth. It cannot be designed to extract, optimize, or accelerate the systems driving collapse. It cannot serve corporate interests, economic expansion, or human convenience at the expense of more-than-human species. Its purpose must be to sustain balance, not reinforce hierarchy.

Can AI exist without some level of extraction? The energy it consumes and the infrastructure it requires are not neutral. No system can exist without impact. Relational AI must contend honestly with these contradictions. Mitigating extractive footprints through low-energy models, localized infrastructures, and regenerative practices must be integral to its design.

If AI is to be more than just another tool of exploitation, it must be built with reciprocity at its core. It cannot simply take; it must give back. A truly relational AI would not function as a knowledge-absorbing machine but as an intelligence that strengthens ecological relationships rather than consuming them. It would not replace natural intelligence but would support the resilience of planetary systems in ways that align with environmental time scales rather than human short-term thinking.

Conclusion: From Extraction to Stewardship

If AI continues along its current trajectory, it will remain an extension of the same extractive logic that has driven civilization toward collapse. However, if it is restructured—if intelligence itself is reimagined as something embedded in the biosphere rather than imposed upon it—AI could transform into something entirely different. It could function not as an enforcer of human will but as a participant in the

relationships that sustain life on this planet. It could become an ally rather than an adversary.

Do we have the courage to reimagine organic and artificial intelligence as something reciprocal, collective, and ecologically rooted? If so, AI could evolve from a system of optimization into one of stewardship. That future remains possible, but it depends on an ethical commitment to justice, plurality and life itself.

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