Insects, AI systems, and the future of legal personhood
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1. Introduction

The legal world is reckoning with the idea of nonhuman personhood. Many countries divide the world into two basic legal categories: persons who have the capacity for duties or rights, and non-persons that lack these capacities. Most countries also assume that all and only humans (or stand-ins for human interests like corporations) can be persons. The result is that all other beings, ranging from monkeys to mountains, are classified as non-persons. We might be able to secure representation for these beings for *our* sakes (for instance, as a matter of property or public interest). But we are not able to secure representation for these beings for *their* sakes.[1]

However, the idea that only persons can have rights and only humans (and corporations) can be persons is untenable. Species membership is not a reasonable basis for personhood. While we might use the terms 'human' and 'person' interchangeably in everyday life, these terms have different meanings under the law. Moreover, membership in a particular species is neither plausibly the basis for personhood nor plausibly a necessary condition for personhood. Any plausible basis for personhood (such as contracts, community, or capacities), reasonably and consistently interpreted, implies that at least some nonhumans can be persons, too.[2]

Recent debates about nonhuman personhood have focused on animals like chimpanzees and elephants. For example, in 2018 the Nonhuman Rights Project attempted to secure recognition of legal personhood for two chimpanzees, Kiko and Tommy. The New York Court of Appeals decided not to hear this case, though Judge Eugene Fahey wrote a supportive opinion.[3] Then, in 2021, the Nonhuman Rights Project attempted to secure recognition of legal personhood for an elephant, Happy. The New York Court of Appeals decided against the Nonhuman Rights Project,[4] albeit with powerful dissenting opinions from Jenny Rivera and Rowan D. Wilson.[5]

Many humans resisted the idea of nonhuman personhood in these cases because they feared that it will lead to a slippery slope. Specifically, they resisted this idea not because of what might happen if we recognize that *this* nonhuman can have *this* right, but rather because of what might happen if we recognize that this nonhuman can have *other* rights, that *other* nonhumans can have this right, or that *other* nonhumans can have *other* rights. After all, we currently exploit trillions of captive and wild animals per year, often unnecessarily. If we were to grant legal standing to all these animals, then our legal, political, and economic systems could grind to a halt.

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[1] Andrews et al. 2018

[2] Andrews et al. 2018.

[3] Nonhuman Rights Project, Inc. on Behalf of Tommy v. Lavery, 31 N.Y.3d 1054, 100 N.E.3d 846 (New York Court of Appeals 2018). (Fahey, J., concurring.)

[4] Nonhuman Rights Project, Inc. v. Breheny, WL 2122141 (New York Court of Appeals 2022). (Majority opinion.)

[5] Nonhuman Rights Project, Inc. v. Breheny, WL 2122141 (New York Court of Appeals 2022). (Rivera, J., dissenting opinion; Wilson, R.D., dissenting opinion.)

This paper makes a case for diving down the slippery slope head first. I argue for extending legal personhood to a *vast number* and *wide range* of individual nonhumans, focusing on insects and AI systems as case studies. I argue that our current framework for legal personhood, coupled with our current framework for risk and uncertainty, implies that we should treat insects and AI systems as legal persons. I then assess whether to accept the conclusion or reject one of the premises. I keep an open mind about which decision to make, but I suggest that no matter what, we should extend legal standing to insects and AI systems in one way or another.

Before I start, a few caveats. First, the legal literature articulates multiple paths towards legal personhood. We can distinguish paths involving *legal rights* and *legal duties*; paths involving *individuals* and *collectives*; and paths involving *intrinsic value* and *instrumental value*. My focus here is on the path involving *legal rights for individuals based on intrinsic value*, since I take this path to be particularly important. But of course, when we consider other possible paths (such as some arguments for AI liability or Rights of Nature), the conclusion that we should extend personhood to insects and/or AI systems only becomes easier to establish.[6] [7]

Second, I focus on insects and AI systems as case studies because they illustrate how potentially large and diverse the legal circle might be. After all, human activity already affects quadrillions of insects every year, and in the future, human activity might affect an even larger number of AI systems. However, we should not reify these categories. My argument in this paper might not apply to all beings inside of these categories, and it might apply to many beings outside of these categories. The general idea will simply be that our current frameworks for legal personhood and risk and uncertainty rightly commit us to a *massive* legal circle expansion.

Third, my argument here will have few, if any, immediate practical implications. If my argument succeeds, then many further questions remain about how to extend legal consideration to insects and AI systems in an ethical, effective, and sustainable manner. And plausibly, the legal instruments that we use to respect insect and AI personhood will need to be very different from the ones that we use to respect human personhood, and we might never be able to extend full and equal legal consideration to all who deserve it. Still, I argue that we should do the best we can to extend legal consideration to these beings, rather than deny that they deserve it.

2. Background

We can start by noting that the stakes of this discussion are high. The world contains many insects and AI systems, and our treatment of these beings harms us and, possibly, them. These impacts generate a collective responsibility to improve our treatment of these beings, both for our sakes and, possibly, for theirs.

[6] Louisa McDonald's (forthcoming) paper "AI Systems and Liability" provides an example of a path to personhood involving duties.

[7] The Rights of Nature literature charts a path to personhood for collectives based (partly) on instrumental value. This line of thought seems to originate with Christopher Stone (1972). In recent years, interest in Rights of Nature scholarship has surged as a growing number of jurisdictions begin to grant rights to natural entities (Kauffman and Martin 2021).

At present, there are about 1.05 million known insect species, making up about 50% of known species.[8] And experts expect that the total number of unknown insect species is much higher; estimates about the total number of insect species vary from two million to six million.[9] Moreover, not only are there many insect species, but there are also many members of these species. Insects are generally r-strategists, which means that they generally have small bodies, short life spans, and high reproduction rates. And according to one estimate, there are about one quintillion (1,000,000,000,000,000,000) insects alive at any given time.[10]

While information about insect cognition and behavior is limited and mixed, many insects have remarkable capacities for perception,[11] learning and memory,[12] communication,[13] and problem solving.[14] Some insects also have the capacity to learn from observing one another[15] and to work together[16] to solve shared problems. Additionally, some insects respond to analgesics and dopamine antagonists in the same way that humans do, and some appear to make trade-offs between the avoidance of noxious stimuli and other preferences.[17] These behaviors suggest that an insect's response to pain is a result of flexible decision-making, rather than mere reflex.

Yet despite these developments, humans continue to objectify insects. At present, we kill about one trillion farmed insects per year for food, clothing, and other purposes,[18] via methods such as boiling, freezing, or shredding.[19] By 2050, humans could be killing hundreds of trillions of insects per year in this industry.[20] Humans also harm or kill quadrillions of wild insects per year to protect ourselves, protect our crops, and achieve other goals, via insecticides that we design to kill insects efficiently rather than to kill them humanely.[21] And since animal farming is on the rise, plant farming and the use of agricultural insecticides are on the rise as well.[22]

Humans are also impacting quintillions of insects per year via the global effects of our activity. Deforestation, development, and other such activities shape which insects can live and what kinds of lives they have. And so far, a general consequence is that insects are dying and insect

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[8] "How many species are there?" Our World in Data, accessed August 27, 2023, https://ourworldindata.org/how-many-species-are-there

[9] Stork 2018

[10] Howe 2019

[11] Dafni et al. 1997; Giurfa and Menzel 1997; Srinivasan 2010; Wu et al. 2013

[12] Dupuy et al. 2006; Giurfa 2007; Avarguès-Weber et al. 2011; Giurfa and Sandoz 2012

[13] Crist 2004; Cocroft and Rodríguez 2005; Hedwig 2015

[14] Perry et al. 2017; Bonabeau et al. 2000

[15] Social learning is well-evidenced in honeybees (Giurfa 2012; Farina et al. 2005; Leadbeater and Chittka 2008; Loukola et al. 2017), and there may be signs of social learning in other insects as well (Leadbeater and Chittka 2007).

[16] Theraulaz et al. 2003; Hirsh and Gordon 2001; Detrain and Deneubourg 2002

[17] Gibbons et al. 2022; van Huis 2021

[18] Rowe 2020

[19] Bear 2019

[20] Rowe 2020; Makkar et al. 2014

[21] Howe 2019

[22] "Collateral Damage," World Animal Protection, 2022

populations are in decline.[23] Moving forward, biodiversity loss, climate change, and other such impacts will affect insects as well. Plausibly, the effects will be mixed. Some populations will contract and others will expand, and some insects will have good lives and others will have bad lives. But while the results might vary, the fact of human influence will not.[24]

Meanwhile, over the past several decades, companies such as Google, Meta, and Microsoft have been developing AI systems for a variety of purposes.[25] While the total number of AI systems is difficult to establish, we can be confident that this number is increasing. And in the future, the world could contain either a very large number of very small AI systems, a very small number of very large AI systems, or both at the same time (depending in part on how we individuate linked systems).[26] For instance, future humans could create countless virtual worlds, such that each one contains as many virtual animals as the physical world contains physical ones.[27]

Corresponding to this increase in AI populations is an increase in AI capabilities. Humans already co-exist with AI systems with capacities for learning, memory, (at least minimal) self-awareness, (at least minimal) social awareness, (at least minimal) language, (at least minimal) reason, and more. In the future, we can expect that some AI systems will have advanced and integrated versions of these and other capacities. At that point, they might achieve a level of intelligence that rivals or exceeds our own. Of course, whether these systems will be sentient is another question. But the more time passes, the more open that question becomes.[28]

While the details might vary, our basic motivation for creating AI systems is the same as our basic motivation for breeding animals: We find them useful. In fact, we sometimes find them useful for similar reasons. For example, humans are currently developing digital systems for research and entertainment in part so we can reduce our use of biological systems for these purposes.[29] Yet if digital systems can have the capacity for welfare too, then our dependence on these systems for these purposes might involve similar risks as our dependence on biological systems: It might result in our harming or wronging welfare subjects unnecessarily.

Moreover, as with our use of animals, our use of AI systems might harm or wrong them not only directly and intentionally but also indirectly and accidentally. For instance, we might harm AI systems indirectly when we allow them to self-replicate, with the foreseeable result that future generations of AI systems will suffer or die unnecessarily. And we might harm them accidentally when we require them to perform boring, repetitive tasks without realizing that these tasks are aversive for them. In all cases, if AI systems might have the capacity for welfare, then we would need to consider all of these expected impacts, not merely the direct and intentional ones.

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[23] Cardoso et al. 2020

[24] Sebo 2022

[25] Zhang et al. 2023

[26] Roelofs and Sebo, n.d.

[27] Chalmers 2022

[28] Sebo and Long, n.d.

[29] For instance, researchers have developed microchips that simulate the microenvironments of biological organs for medical research (Wu et al. 2020). Similarly, the company Edge Innovations has developed hyper-realistic animatronics to replace the use of biological animals in films, theme parks, and educational settings. See: Edge Innovations. “Edge Innovations.” Accessed August 28, 2023. https://www.edgefx.com/.

Many humans never think twice about these interactions with insects and AI systems. Granted, we might take some insects to have aesthetic, cultural, economic, or ecological value. But when we value them in these ways, we tend to value them at the species level, not at the individual level, and we tend to value them for our sakes, not for theirs. And granted, many humans do experience many AI systems as subjects, particularly when AI systems are designed to act like humans.[30] But, first, most AI systems are not designed this way. And second, even when they are, they tend to be programmed to explicitly state that they are *not* welfare subjects.[31]

Yet these ways of seeing and treating insects and AI systems are shortsighted. We should see and treat these beings differently for our sakes as well as, possibly, for their own sakes. Take our treatment of insects. Our current interactions with insect populations risk contributing to global threats that imperil us all. We rely on a wide range of insect species for a wide range of ecosystem services, and if we continue to drive insect species to extinction at our current pace, then we might soon find that the world contains not only less natural beauty, but also less breathable air, potable water, and edible food via biodiversity loss and ecosystem collapse.[32]

Similar links may be present with AI systems as well. Our current interactions with AI systems risk contributing to global threats that imperil us all as well. Human use of AI systems is already causing harm, for instance by spreading misinformation, making jobs obsolete and amplifying racism, sexism, speciesism, and other harmful attitudes contained in their training data.[33] And as AI systems become more powerful, they risk causing more harm, either because we lose control of them or because we retain control of them and use them for harmful purposes. Either way, risks such as global pandemics, nuclear war, and totalitarianism could increase.[34]

Additionally, and more fundamentally, when we oppress insects and AI systems, we reinforce oppressive beliefs, values, and practices that shape our treatment of each other, too. For instance, many humans rationalize the oppression of other humans through dehumanizing narratives that compare their victims to animals who are presumed to be "lesser than" due to perceived physical or cognitive difference. And when we reinforce the idea that nonhuman animals can be "lesser than" for these reasons, we also reinforce the idea that humans can be "lesser than" for these reasons, too. In this respect, human and animal liberation are conceptually linked.[35]

Similar links may be present with AI systems as well. Since many AI systems are designed to resemble humans, there is a risk that our interactions with humans and AI systems will be mutually reinforcing. For instance, if AI developers present digital assistants as women, will that reinforce the idea that women belong in subordinate roles? And if users then tell digital assistants what to do without saying "please" or "thank you," will that reinforce the idea that individuals in

[30] Jacobs et al. 2023; Salles et al. 2020
[31] Lloyd 2023
[32] Cardoso et al. 2020
[33] Acemoglu et al. 2022; Chelliah 2017; Zajko 2022; Longpre et al. 2022
[34] Bostrom 2014; Vold and Harris 2021; Center for AI Safety 2023
[35] Ko and Ko 2017; Taylor 2017; Crary and Gruen 2022

subordinate roles can be treated that way? Granted, further research is needed to test these hypotheses, but we should at least be open to these possibilities at this stage.[36]

In the case of nonhuman animals, these links between human and nonhuman fates are part of the motivation for the One Health policy framework, which recognizes that human, animal, and environmental health are linked, and so our efforts to protect human, animal, and environmental health are linked, too.[37] They are also part of the motivation for the Rights of Nature personhood framework, which (in its 'instrumental value for collectives' form) extends legal personhood, rights, and standing to natural systems to create a mechanism for protecting the instrumental value that they have for humans.[38] In the future, the same might be true for AI systems.

In any case, as noted above, my argument here will not depend on the idea that we owe it to *ourselves* to treat insects and AI systems differently, but will rather depend on the idea that we *might* owe it to *them*. As we will see, standard theories of welfare, moral standing, and legal standing treat either capacities such as sentience and agency or relationships such as contracts and communities as sufficient for these features and forms of standing. I will suggest that when we consider insects and AI systems with all due humility about these matters, we see that we should extend them at least some consideration for their own sakes, in the spirit of caution.

3. Legal Personhood

We can start by examining a plausible and widely accepted framework for legal personhood, according to which the distinction between persons and non-persons amounts to the distinction between those who can hold rights or duties and those who cannot. The question then becomes, in part, what kinds of beings can hold rights or duties, and why.

At present, many countries divide all beings into either of two basic legal categories: 'person' and 'non-person.' According to this distinction, to be a person is to have the capacity for legal duties, rights, or both. In contrast, to be a non-person is to lack both of these capacities. As noted above, this view allows for multiple paths towards legal personhood, including paths involving legal duties and legal rights, paths involving individuals and collectives, and paths involving intrinsic and instrumental value. My focus in this paper is on the path involving *legal rights for individuals based on intrinsic value*, but other paths are worth exploring too.

What, then, is it to have a legal right? To have a legal right is to have a claim that a court must consider, provided that you have legal standing relative to that claim and that agent. Some rights are products of constitutional, federal, or state laws; the US constitution, for instance, establishes a right to free speech and assembly for US citizens. In contrast, other rights exist prior to and independently of human laws; the US constitution, for instance, recognizes that all humans have

[36] There is already some evidence that human bias and AI bias can be mutually reinforcing. For example, Kay, Matuszek, and Munson (2015) found that (i) online image search results for certain occupations slightly exaggerate humans' preexisting gender bias and (ii) the same search results reinforce and further perpetuate that bias.

[37] World Bank Group 2018; Bernotas et al. 2021; FAO, UNEP, WHO, and WOAH 2022; CDC 2023

[38] Stone 1972; Kauffman and Martin 2021

an "inalienable right" to life, liberty, and the pursuit of happiness independently of our citizenship status.[39] My focus in this paper will be on the latter category of rights.

What, then, is it to have legal standing in a particular case? To have legal standing in a particular case is to satisfy the criteria for a court to hear a claim for your sake. The details are a matter of debate, but a standard view is that the criteria involve at least this much: You endure a specific harm, there is a causal link between this harm and the alleged behavior, and a favorable verdict would be sufficiently likely to redress the harm.[40] If you count as a person with rights, if you satisfy the criteria for standing, and if you are in the zone of interest that the relevant statute is intended to protect, then a court has a legal responsibility to consider your claim.[41]

As this discussion suggests, there are several close links between the concepts of legal personhood, legal rights, and legal standing. First, the capacities for legal rights and standing are sufficient for legal personhood. If you can have rights and standing, then you count as a person. And second, the capacities for legal rights and standing are necessary and sufficient for each other. If you can have rights, then you can have standing, and vice versa. Of course, you can have rights without *actually having standing in particular cases*. But you cannot have rights without *possibly having standing in any case*. That would amount to not having rights.

Four general features of this framework for personhood, rights, and standing are worth noting. First, and again, legal persons in this sense can have legal rights whether or not they have legal duties. 'Legal person' is a general category that includes what I call *legal agents* who can have *legal duties* as well as *legal patients* who can have *legal rights*.[42] Of course, many of us are legal agents *and* patients. But in principle, one can be either without being both. This is why many legal institutions rightly treat humans who lack the capacity for propositional language and reason as having *rights* whether or not they also treat these humans as having *duties*.

Second, legal persons in this sense can have rights with different *contents*. Specifically, the content of our rights can depend on the content of our experiences or motivations, which can vary.[43] For instance, we might think that humans and mice both have a right to free speech in a general sense, since we both have the ability to communicate. But we might also think that only some humans can have a right to free speech in a more specific sense, since only some humans have the ability to communicate *propositionally*. On this view, it makes no sense to ask whether a mouse has the right to, say, practice journalism, since they lack the ability to do so.

Third, legal persons in this sense can have rights with different *strengths*. Plausibly, the strength of our rights depends on the strength of our experiences or motivations, which can vary as well. For instance, we might think that humans and mice both have a right not to suffer because we

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[39] For further information on legal and natural rights, see Raz (1996) and Kamm (2004, 2022).

[40] Laidlaw, 528 U.S., 180-181; Cassuto et al. 2006

[41] Cassuto et al. 2006

[42] Moral philosophers commonly make the distinction between "moral agents" and "moral patients" (Pluhar 1988). This paper adapts that terminology for use in a legal context.

[43] Some legal scholars accept an 'interest' theory of rights (Raz 1998; Tasioulas 2015) and others accept a 'will' theory of rights (Hart 1982). The discussion in this paper is meant to be neutral between these kinds of theories, provided that we interpret both sufficiently expansively.

both have the ability to suffer. But we might also think that humans can have a stronger right not to suffer in some cases because we have the ability to suffer *more*. On this view, if an agent is deciding whether to allow a human or a mouse to suffer as much as they possibly can, they should treat the bar for allowing the human to suffer as higher, all else equal.[44]

Fourth, legal personhood is only one factor among many in our decisions about how to treat each other. There are many layers of legal and political status that bear on the content and strength of our rights, including not only personhood but also citizenship and other relational statuses.[45] Additionally, our legal priorities can depend not only on which policies respect rights but also on which policies are best overall, which policies are democratically preferred, which policies are achievable and sustainable, and so on. In this respect, personhood might be the price of admission for rights and standing, but many other factors determine the details.

With that in mind, at present, many countries classify all and only humans (and some stand-ins for human interests) as persons. Below, I will explain why this classification is a mistake. For now, what matters is that we observe that 'human' and 'person' are not synonymous under the law. 'Human' is a descriptive concept that refers to members of a particular species. In contrast, 'person' is a normative concept that refers to individuals who can hold duties or rights. Thus, the idea that all and only humans (and some stand-ins for human interests) is not merely definitional. It is a substantive claim about the basis for duties and rights that requires a defense.[46]

Importantly, some experts believe that we should reject the binary distinction between persons and non-persons. For example, some experts favor moving toward a three-part distinction between legal persons, who merit legal rights for their own sakes; legal beings or quasi-persons, who merit legal consideration for their own sakes; and legal objects, which merit no legal rights or consideration at all for their own sakes.[47] Additionally, many governments already classify animals as sentient beings in this sense, including countries like France and the UK and cities like Mexico City and Quebec, and many others are likely to follow suit moving forward.[48]

The three-part approach has pros and cons that merit careful attention. On one hand, this approach is better than nothing. It might also be more tractable in the short term, since the idea that animals merit consideration might seem less radical than the idea that they have rights and standing. On the other hand, this approach raises questions about what this middle-ground status involves. It might also be difficult to classify all and only humans as persons on this approach, since if we set the bar for personhood low enough, then many nonhumans will count, whereas if we set the bar high enough, then many humans will not count.

My own view is that preserving the binary distinction between persons and non-persons is better than creating a three-part distinction that involves a middle-ground category. The binary view allows us to preserve the simple idea that a legal person is a being with the capacity for legal

[44] Shukraft 2020; Kagan 2022
[45] Cochrane 2019
[46] Andrews et al. 2018, 13–40
[47] See e.g. Fernandez (2019) and Dekha (2021).
[48] Andrews et al. 2018, 101–110

duties or rights and a legal non-person is a being without these capacities. It also allows us to preserve the plausible idea that all humans are persons with rights and standing. Granted, it also requires us to accept the revisionary idea that many nonhumans are persons with rights and standing too. But as we will see, this idea can be made plausible as well.

Moreover, we might be able to modify the binary approach to accommodate the intuitions that support the three-part approach. For example, if we find the idea of nonhuman personhood confusing because we associate 'person' with humans or agents, then we can always replace it with a new term, such as 'subject'. And if we see substantive distinctions among persons / subjects, then we can always make corresponding terminological distinctions (say, between 'human persons / subjects' and 'ant persons / subjects,' and between 'persons / subjects who are agents' and 'persons / subjects who are patients.' More on these points below.

With that said, I support pursuing both of these approaches for now. They both imply that we should extend legal consideration to nonhumans, which is what matters most. I might also be wrong about which approach is best, and either way, they can be mutually reinforcing in the short term even if one or the other is best in the long run. For instance, advocating for the binary approach can shift the center of debate and pave the way for implementing the three-part approach in the short term. And implementing the three-part approach can then shift the goal posts and pave the way for implementing the binary approach in the long run.

In any case, I will not insist that we should preserve the binary distinction between persons and non-persons here. Instead, I will simply make the conditional argument that *if* we preserve this distinction, *then* we should classify insects and AI systems as persons. If my view that we should preserve this distinction is correct, then it follows that we should, in fact, classify these beings as persons. If not, then everything that I say here is compatible with the idea that we should at least classify them as legal beings or quasi-persons instead. Either way, what matters is that we treat them as legal subjects who merit legal consideration for their own sakes.

4. Risk and Uncertainty

We can now examine a plausible and widely accepted framework for risk and uncertainty. The basic idea is that we have both a moral and a legal responsibility to consider non-negligible risks, and to treat the non-negligible risk that our actions or policies will harm someone as a consideration against selecting those actions or policies.

As a general matter, we all agree that we should consider non-negligible risks when making decisions. For example, we all agree that driving drunk is both morally and legally wrong not because it will *definitely* harm or kill someone, nor even because it will *probably* do so, but rather, merely, because it has at least a *non-negligible chance* of doing so. Indeed, driving drunk might carry only a one in a thousand chance of harming or killing someone. But in standard cases, even a one in-a-thousand chance that an action would harm or kill someone can be a sufficient reason to select another action, such as calling a friend or taxi, instead.[49]

[49] Sebo, forthcoming-a; Sebo, forthcoming-b

Granted, we might disagree about the details. One detail concerns *how* we consider risk. Some people think that we should accept a precautionary principle. There are many interpretations of such a principle, but for present purposes, we can interpret the principle as holding that when in doubt about whether a particular harm will occur, we should simply assume that it will. According to this principle, for instance, if you feel uncertain about whether a particular action would kill 10,000 people, then you should simply assume that it would, in fact, kill these people, and you should ask if the action is worth it in light of that assumption.[50]

In contrast, other people think that we should use an expected value principle. Once again, there are many interpretations of such a principle, but for present purposes, we can interpret the principle as holding that when in doubt about whether a harm will occur, we should multiply the probability of harm by the level of harm. According to this principle, for instance, if you think that a particular action carries a one in a thousand chance of killing 10,000 people, then you should assume that it would kill ten people (ten thousand divided by one thousand), and you should ask if the action is worth it in light of that assumption.

Another detail concerns *when* we consider risk. Some people think that we should use a no threshold principle. According to this principle, all risks merit consideration, including extremely low ones. For example, even if your action carried only a one in a quintillion chance of killing 10,000 people, you should still consider this possibility when making a decision. Granted, we might give extremely little weight to extremely low risks. For instance, a one in a quintillion chance of killing 10,000 people amounts to killing only 0.0000000000001% of a person, in expectation**.** But we should still give at least *some* weight to these possibilities.[51]

In contrast, other people think that we should use a low threshold principle. According to this principle, all risks above a particular probability threshold merit consideration, and all risks below this threshold do not. Different people set this probability threshold at different places, ranging from a one in ten thousand chance of harm to a one in ten quadrillion chance of harm. Either way, this principle implies that we have a responsibility to give at least some weight to, say, a one in a thousand chance of killing 10,000 people, but that we can permissibly give no weight at all to, say, a one in a quintillion chance of causing this harm.[52]

In any case, what matters for present purposes is that all of these principles support the general idea that at least *non-negligible* risks merit at least *some* consideration. They also support the idea that a one in a thousand chance of causing harm is non-negligible. When I refer to our standard framework for risk and uncertainty in this paper, I mean these ideas and nothing more. As a result, when I argue that our current framework for legal personhood, coupled with our current framework for risk and uncertainty, commits us to treating insects and AI systems as persons, nobody can reasonably accuse me of stacking the deck in favor of my view.

I elsewhere argue that this framework for risk and uncertainty has implications for moral standing. Without presenting the full argument here, I can present the general idea: When we

[50] O'Riordan and Cameron 1994

[51] The no threshold principle is sometimes called "fanaticism." For discussion, see Wilkinson (2022) and Russell (2023).

[52] Smith 2014; Monton 2019; Beckstead and Thomas 2023

decide whether to include particular beings in the moral circle (that is, when we decide whether to recognize particular beings as having moral standing), we need to make these decisions under both normative and descriptive uncertainty. Normatively, we need to make these decisions under uncertainty about which features are sufficient for moral standing. And descriptively, we need to make these decisions under uncertainty about which beings have these features.[53]

Why should we take ourselves to be uncertain about these issues? One reason is that this topic forces us to confront some of the hardest issues in science and ethics, including the nature and value of other minds.[54] Since the only mind that each of us can directly access is our own, we can never be certain what, if anything, it might be like to be other kinds of being, and how, if at all, it might be valuable to be other kinds of being.[55] Since our actions affect other beings whether we like it or not, we should attempt to determine which beings matter as best we can. But since our perspectives are limited at best, we should also proceed with caution and humility.[56]

Another reason we should take ourselves to be uncertain about these issues is that we have a long track record of overestimating what it takes to matter and underestimating who has what it takes. For example, for much of the twentieth century, many experts believed that rationality is necessary for moral standing, either because rationality is the basis for moral standing or because sentience is the basis for moral standing but rationality is necessary for sentience. Yet this view is now widely rejected. And when we consider this context, we should allow for the possibility that our views about the moral circle are too restrictive in the same kind of way.[57]

Of course, as in other contexts, the details matter. For example, if we generally accept a precautionary principle, then when in doubt about whether someone matters, we should simply assume they do. In contrast, if we generally accept an expected value principle, then when in doubt about whether someone matters, we should multiply the probability that they matter by how much they would matter if they did. For this reason, the expected value principle will generally produce a more hierarchical version of the moral circle than the precautionary principle, since it will give more weight to beings who are likelier to matter, all else equal.

Similarly, if we generally accept a no threshold principle, then when in doubt about whether someone matters, we should include them in the moral circle as long as they have *any chance at all* of mattering. In contrast, if we generally accept a low threshold principle, then when in doubt about whether someone matters, we should include them in the moral circle only if they have a *non-negligible chance* of mattering. For this reason, the low threshold principle will generally produce a much smaller moral circle than the expected value principle, since it will exclude at least *some* potentially sentient or otherwise significant beings, all else equal.

But as before, what matters is that all of these principles support the general idea that we should

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[53] Sebo, forthcoming-a; Sebo, forthcoming-b

[54] For example, the question of how physical processes can give rise to conscious experience has become known as the "hard problem of consciousness" (Chalmers 1995).

[55] For discussion of the epistemological problem of other minds, see Carruthers (2004).

[56] Sebo 2018

[57] For discussion, see Singer 2011.

extend at least *some* consideration to beings with at least a *non-negligible* (that is, at least a one in a thousand) chance of mattering. In keeping with my pluralist assumptions in this paper, I will assume that and nothing more. This will make my argument compatible with everything from the radical view that we should give all potential subjects equal weight to the conservative view that we should give some potential subjects much less weight than others (based on how likely they are to matter and how much they would matter if they did) and others no weight at all.

And if we assume at least this much, then insects, AI systems, and other such beings plausibly make the cut. First, experts now widely agree that sentience is sufficient for moral standing, but they still disagree about whether other features (say, consciousness or agency) are sufficient too. And while we might feel confident that sentience is necessary, it would be a mistake to be certain about that at this stage. Given the difficulty of these descriptive questions and our long track record of bias and ignorance about them, we should allow for *at least* a one in a thousand chance that our current views about the basis for moral standing are still too exclusionary.

Second, experts now widely agree that all vertebrates and some "higher" invertebrates such as octopuses are sentient, but they still disagree about whether other kinds of beings (say, insects and AI systems) are sentient too. And while we might feel confident that relatively complex, centralized, and carbon-based brains are necessary, it would be a mistake to be certain about that at this stage. Given the difficulty of these normative questions and our long track record of bias and ignorance about them, we should once again allow for *at least* a one in a thousand chance that our current views about the basis for sentience are too exclusionary.

In my view, then, when we consider whether to include insects and AI systems in the moral circle with sufficient caution, we have no choice but to conclude that they have *at least* a one in a thousand chance of being sentient or otherwise significant, given the evidence available. It follows that we should extend insects and AI systems at least *some* consideration when deciding how to treat them. Again, we might give more weight to humans and other vertebrates, insofar as we might be *more likely to matter* and we might be *likely to matter more*. But we should still give at least some weight to insects and AI systems too, even if only very little.

5. Legal Circle Expansion

If, then, we combine this framework for legal personhood with this framework for risk and uncertainty, the result is a conditional case for insect and AI legal personhood. *If* we should maintain a binary distinction between legal persons and non-persons, *then* we should classify insects and AI systems as legal persons.

A simple argument for treating insects and AI systems as legal persons would proceed as follows: 1. If we should treat a being as having moral standing, then we should treat them as having legal standing. 2. If we should treat a being as having legal standing, then we should treat them as a legal person (since all and only legal persons have legal standing). 3. We should treat insects and AI systems as having moral standing, for the reasons noted above. 4. Thus, we should treat these beings as legal persons. I personally find this argument compelling, but I will set it aside to examine what follows from prevailing theories of legal personhood.

As noted above, the prevailing views about legal standing, at least in the United States, fall into four categories: species membership, contracts, community, and capacities.[58] And the latter three of these views each admits of at least two interpretations: a strong interpretation that excludes at least some humans from the legal circle, and a weak interpretation that includes at least some nonhumans in the legal circle. To decide whether to include insects and AI systems as legal persons, then, we need to estimate how likely each view is to be correct, as well as how likely insects and AI systems are to be legal persons according to each view.

Take the species membership view first. This view holds that membership in the species *Homo sapiens* is the basis for legal personhood. And the reason is *not* that all and only members of the species *Homo sapiens* have particular capacities or relationships (since in that case, the species membership view would reduce to the contracts, community, or capacities view, which we can consider in a moment). The reason is instead, simply, that members of the species *Homo sapiens* are members of the species *Homo sapiens*. We can have legal duties or rights simply because we can be classified in a particular scientific taxonomic category.

As I and others argue elsewhere, this view is implausible.[59] As with other scientific taxonomic categories, species membership is not the kind of category that can serve as the basis for legal duties or rights. Granted, it might track *other* features that matter (though, as we will see in a moment, it tracks these features only imperfectly). But it does not matter in itself. We can see this clearly when we reflect on why we merit rights. Do you need to take a genetic test to confirm that you have a right to life, liberty, and the pursuit of happiness? Of course not. Your introspective awareness of your capacities and relationships is enough.

With that said, we can grant that if the species membership view were correct, then nonhumans, ranging from chimpanzees and elephants to insects and AI systems, would not count as legal persons, with the capacity for legal rights and legal standing. So, to the extent that we allow for the possibility that this view is correct despite its implausibility, we must also allow for the possibility that none of these nonhumans can be legal persons. While I personally think that the species membership view is *extremely* unlikely to be correct, I will assume for the sake of argument that this view is on a par with the other three views.

Now take the contract view. This view holds that social contracts are the basis for legal personhood. A social contract is an agreement among members of society that defines our duties to each other and rights against each other. A strong form of this view defines a contract as an agreement that we make explicitly, and it extends legal duties and rights only to the parties to the contract. In contrast, a weak form defines a contract as an agreement that we make explicitly or implicitly, via our behavior, and/or it extends legal duties and rights to the parties to the contract as well as anyone or anything else, as specified in the contract.

As I and others argue elsewhere, a weak form of this view is more plausible than the strong form.[60] The strong form excludes many humans from the legal circle. After all, all humans are

[58] Andrews et al. (2018) informs this point and much of the following text.

[59] Andrews et al. 2018, 13–40

[60] Andrews et al. 2018, 41–60

incapable of explicitly agreeing to social contracts early in life, many of us lose this capacity later in life, and many of us never develop this capacity at all. Yet we rightly treat each other as legal persons, with legal rights and legal standing, anyway. According to the social contract view, this must be for either of two reasons: We can be parties to the social contract implicitly, or we can be covered by the social contract despite not being parties to it.

With that in mind, insofar as we give weight to the strong form of this view, we can rule out insect personhood, though we should stay open to AI personhood, since we should stay open to the possibility that at least some AI systems will have the capacity to be parties to explicit contracts. And insofar as we give weight to the weak form, we should stay open to both kinds of personhood. Plausibly, both insects and AI systems can participate in implicit social contracts via their behavior. And plausibly, they can also be covered by explicit social contracts despite not being parties to it, provided that we decide that they merit legal inclusion.

Now take the community view. This view holds that community is the basis for legal personhood. A community is a group of individuals bound together by shared beliefs, values, or practices. A strong form of this view defines a community in terms of a relatively specific and demanding set of beliefs, values, and practices; for example, it might require a shared language and culture. In contrast, a weak form defines a community in terms of a relatively general and undemanding set of beliefs, values, or practices; for example, it might require only a shared set of norms that we develop through our interactions with each other.

The analysis is the same as before.[61] As with the contract view, the strong form of the community view implausibly excludes many humans from the legal circle. After all, many humans lack the capacity to have a language and culture at all, and many other humans have different languages and cultures than each other. Yet we rightly treat each other as legal persons, with legal rights and legal standing, anyway. According to the community view, the reason must be that while shared language and culture is, perhaps, necessary for having *some* rights, a more general set of interactions is sufficient for having *other* rights, and thus for being a person.

With that in mind, insofar as we give weight to the strong form of this view, we can once again rule out insect personhood, though we should once again stay open to AI personhood, since we should stay open to the possibility that at least some AI systems will have the capacity to share language and culture with humans. And insofar as we give weight to the weak form, we should be open to both kinds of personhood. Plausibly, both insects (particularly social insects with the capacity for social learning) and AI systems (particularly advanced AI systems with the same capacity) can partake in at least some kinds of norms via their interactions.

Finally, take the capacities view. This view holds that capacities are the basis for legal personhood. The capacities discussed in this literature tend to overlap with the ones discussed in the literature on moral standing. A strong form of this view requires a relatively specific and demanding set of capacities, such as the capacity for propositional agency (the ability to act on judgments about reasons). In contrast, a weak form requires a relatively general and

[61] Andrews et al. 2018, 61–76

undemanding set of capacities, such as the capacity for sentience (the ability to feel pleasure or pain) or perceptual agency (the ability to act on normative perceptual states).

The analysis is once again the same as before.[62] The strong form of the capacities view implausibly excludes many humans from the legal circle. After all, many humans lack the capacity to act on judgments about reasons. (Indeed, this is why we might lack the capacity to participate in explicit contracts or have particular languages or cultures.) Yet we rightly treat each other as legal persons, with legal rights and legal standing, anyway. According to the capacities view, the reason must be that while propositional agency is, perhaps, necessary for *some* rights, it is not necessary for *other* rights, and thus for being a person.

With that in mind, insofar as we give weight to the strong form of this view, we can once again rule out insect personhood, though we should once again stay open to AI personhood, since we should stay open to the possibility that at least some AI systems will have the capacity for propositional agency (among other advanced capacities). And insofar as we give weight to the weak form, we should be open to both kinds of personhood for the reasons discussed above. We are simply not in a position to be certain about whether insects and AI systems can have sentience or agency one way or the other, given the evidence available.

When we assess these views with appropriate humility, it seems clear that we should allow for at least a one in a thousand chance that some insects and AI systems can be legal persons. First, the weak contract, community, and capacities views are more likely to be correct than the strong contract, community, and capacities views. And second, many insects can plausibly be persons according to the latter three views, and many AI systems can plausibly be persons according to every view except the species membership view. The odds of many insects and, especially, AI systems counting as legal persons is thus likely much higher than the required 0.1%.

6. Objections and Replies

This section considers what I take to be the two main objections to insect and AI personhood. The demandingness objection holds that insect and AI personhood are too demanding, and the transformative objection holds that insect and AI personhood are too transformative. These objections are reasonable but not, I think, compelling.

First, consider the demandingness objection. Again, this objection holds that insect and AI personhood are too demanding. As we have seen, the world contains quintillions of insects in millions of species, and in the future, the world could contain an even vaster number and wider range of AI systems. Meanwhile, our legal systems still lack the epistemic, practical, and motivational resources needed to respond appropriately to legal personhood within our own species. Thus, extending legal personhood not only to, say, chimpanzees and elephants but also to, say, insects and AI systems would stretch our capacity to the breaking point.

My response to this objection comes in three parts. First, treating insects and AI systems as legal persons might not be *that* demanding. We have already seen that insects and AI systems might

[62] Andrews et al. 2018, 77–100

have fewer and weaker rights than us in some cases. We can now add that rights can admit of exceptions. For example, we accept that humans have a right to life, but we also accept that we can be killed in self-defense, in other-defense, as a side effect of important activity, and even, on some views, as a means to sufficiently important ends (say, killing one to save a hundred, or thousand, or million). These exceptions can all apply for insects and AI systems too.[63]

Similarly, standing can take different forms. Given the vast number and wide range (and, in many cases, short lives) of insects and AI systems, we might not be able to provide them all with the same kind of due process that we provide fellow humans. But we might still be able to provide them with other kinds of due process. For example, even if a judge might not be able to hear the claims of each of the billions of insects being farmed at any given time by a particular company, they might be able to hear the claims of all of these insects at once – the ultimate class action lawsuit. The same can be true of copies of chatbots and other AI systems.

Second, insofar as treating insects and AI systems as legal persons *is* demanding, this result might be acceptable. Even when we focus on human populations, we can see that treating vulnerable populations as they deserve can be demanding. This is especially true when the world contains a lot of conflict and need, and when our shared structures disproportionately benefit some and burden others. But while we might not have a duty to do more than we can in these cases, we at least have a duty to do what we can. The same can be true, in different ways and to different degrees, for vulnerable nonhuman populations, including insects and AI systems.

Granted, the idea that the law can be so demanding might seem unacceptable. But of course, when you have privilege, equality – or even, for that matter, less inequality – can feel like oppression, and this feeling should be taken with a grain of salt. And of course, what feels demanding now might not feel as demanding in the future. Our ability to improve our interactions with insects and AI systems might be limited at present, due to the limits of our shared structures and our knowledge, power, and motivation. But the more we change these conditions, the more we might be able to improve our interactions with these beings.

Third, insofar as treating insects and AI systems as legal persons is unacceptably demanding, the upshot is not that insects and AI systems are non-persons. The upshot is instead simply that the world is tragic. As noted above, our legal systems are currently incapable of treating every human as they deserve. Insofar as our legal systems lack this capacity, does it mean that the humans who slip through the cracks are not, in fact, persons with rights or standing? Or does it instead mean that the world is tragic, and that we might not always be able to treat others as they deserve? Clearly it means the latter. And the same can be true for insects and AI systems.

Granted, one might argue that there is no point in *recognizing* beings as persons when we lack the ability to *treat* them as persons. But first, I have suggested that we might be able to treat insects and AI systems as persons in some respects even if we lack the ability to do so in other respects. I have also suggested that our ability to treat them as persons might increase over time. In the meantime, we can at least recognize many insects and AI systems as legal persons whether

[63] Sebo 2022, 15–39

or not we have the ability to act accordingly yet. This is the very least we can do, and it will make us more likely to develop the ability to treat these beings as legal persons over time.

The upshot is that the demandingness objection is reasonable but not, I think, compelling. Yes, we should clearly not attempt to do more for insects, AI systems, and other such beings than we can realistically achieve or sustain. But if they have a non-negligible chance of satisfying the criteria for legal personhood, rights, and standing, we should still recognize them as legal persons, with legal rights and standing, and we should still do much more for them than we currently are. And as our capacity to harm them less and help them more increases, our responsibility to improve our interactions with them will increase as well.

Now consider the transformative objection. Again, this objection holds that insect and AI personhood would be too transformative. As we have seen, there are many relevant differences between the kinds of legal consideration that humans, insects, and AI systems should receive. Thus, if we use the same concepts (personhood, rights, and standing) to describe these different kinds of consideration, then we risk obscuring these differences and mistreating either humans, insects, or AI systems as a result. Either way, this change would transform the concepts of personhood, rights, and standing past their breaking points.

My response to this objection comes in three parts as well. First, treating insects and AI systems as legal persons might not be *that* transformative. Recall that personhood is already an expansive concept that can include agents and patients, different kinds of duties and rights, and different kinds of standing. For example, we classify both adults and children as persons. Does that obscure relevant differences between them? Do we accidentally force children to pay taxes or force adults to attend school? No. Instead, we treat these individuals as similar in some ways and different in others. The same can be true for humans, insects, and AI systems.

Granted, treating insects and AI systems as legal persons might change how we interpret the concepts ‘personhood,’ ‘rights,’ and ‘standing’ in some ways. For example, it might make the expansiveness of these categories more salient to us, and it might motivate us to modify our discourse and practice around legal consideration in some ways as a result. For instance, we might start using general terms like ‘person,’ ‘rights,’ and ‘standing’ less, and we might start using specific terms like ‘human person,’ ‘human rights,’ and ‘human standing’ more. But this kind of conceptual and linguistic evolution is common and, in this case, welcome.

Second, insofar as treating insects and AI systems *is* transformative in the relevant sense, this result might be acceptable. All conceptual options carry risks, and we need to consider all of these risks when deciding what to do. Specifically, using the same concept to describe the kind of legal consideration that humans, insects, and AI systems should receive risks leading us to overestimate our similarities. But using different terms risks leading us to overestimate our differences. And at present, both the probability and level of harm of overestimating difference may be higher. So, plausibly, we should err on the side of overestimating similarity.

Granted, even if the benefits of overestimating similarity outweigh the costs, the costs might still be difficult to accept. In that case we might consider further options. For instance, we might decide that our longstanding association between persons, humans, and agents renders the

concept 'person' unfit to play its current role in our legal frameworks, and so we might decide to start using a different term, such as 'subject,' to play the role that we previously used 'person' to play. But this kind of conceptual and linguistic revolution, while less common than the evolution previously described, can happen when necessary, and it may well be necessary here.

Third, insofar as treating insects and AI systems as legal persons (or subjects) is unacceptably transformative, the upshot is not that insects and AI systems lack legal claims that courts should consider. The upshot is simply that we should use different concepts to describe these claims. For instance, if we take the three-part approach described previously, where we classify humans as legal persons, animals and AI systems as legal beings or quasi-persons, and everything else as objects, then we would still be using 'person' for all and only humans. But in this case, personhood would no longer be necessary for legal claims that courts should consider.

As I noted above, my own view is that preserving the binary distinction between persons and non-persons (or, perhaps, between subjects and objects) is better than creating a three-part distinction with a middle-ground category. But what matters most is that we disrupt the status quo, which rests on an ambiguity. We currently treat personhood as expansive when defining it ("an individual who can hold rights or duties") and as restrictive when applying it ("all and only humans can be persons"). We should either be consistently expansive in our definition and application of this concept or be consistently restrictive in both.

7. Conclusion

I have argued that our current framework for legal personhood, coupled with our current framework for risk and uncertainty, imply that we should treat insects and AI systems as legal persons, with legal rights and standing. However, I have also emphasized that this argument has few, if any, immediate practical implications, since a lot depends on the answers to a wide range of questions, such as what forms of rights and standing these beings should have and what forms of interaction with them we can achieve and sustain. At the same time, I think that at least some implications will follow from any reasonable set of answers to these questions.[64]

First, as a general matter, both individuals and governments should harm insects, AI systems, and other such beings much less and help them much more, provided that we can do so ethically, effectively, and sustainably. In particular, we should avoid harming insects, AI systems, and other such beings unnecessarily, and if and when we do harm these beings unnecessarily, we have a moral and legal responsibility to help these beings where possible, in the spirit of reducing and repairing these harms. Granted, harming these beings might sometimes be necessary, and helping them might sometimes be impossible. But we should do what we can.

Second, since our ability to treat insects, AI systems, and other such beings well is limited at present, we should work to create the conditions that will allow us to treat them better in the future. Specifically, we should work to build the knowledge, power, and motivation that we need to treat them well. And as part of that work, we should work to build social, political, and economic systems that reduce conflict between humans, insects, and AI systems and expand

[64] These concluding remarks draw from the main themes and recommendations in Sebo (2022).

options for harmonious co-existence. And insofar as we succeed, we will have *both* the capacity *and* the responsibility to do more for these beings in the future than we do at present.

And third, as a means to these ends, we should pursue policies that help humans and nonhumans at the same time where possible, and that allow us to build momentum toward more ethical and effective future policies. That will allow us to do at least some good for at least some nonhumans at present. It will also allow us to build knowledge, power, and motivation towards better future policies, since we can learn from these efforts; we can develop a social, legal, and political infrastructure for considering humans and nonhumans together via these efforts; and we can normalize the idea of considering humans and nonhumans together via these efforts.

In general, taking these steps will require *holistic* thinking about our policies. For example, many humans see insect farming as an ethical alternative to traditional animal farming. But an industry that kills trillions of individuals who might matter is not an acceptable alternative. Likewise, many humans see the use of AI models as an ethical alternative to traditional animal research. But an industry that kills a comparable number of these individuals is not an acceptable alternative either. While farming, research, and other such industries might always involve at least *some* risks, we can start thinking holistically now about how to mitigate these risks.

This will also require *structural* thinking about our policies. As we have seen, part of why we harm insects so much is that our infrastructure amplifies interspecies conflict. As we upgrade our cities and food, energy, and transportation systems to be more resilient and sustainable, we can also upgrade them to be more accommodating of insects. Similarly, part of why we have the potential to harm AI systems so much is that AI researchers are locked in a collective action problem that makes ethics and safety appear to be unaffordable luxuries. By addressing this collective action problem, we can create the space that we need to treat AI systems well.

Finally, this will also require *comprehensive* thinking about our policies. As we have seen, human activity impacts nonhumans not only directly but indirectly. While we kill many insects directly, we kill many more via the indirect effects of human activity, such as climate change. And while we have the potential to kill a comparable number of AI systems directly, we have the potential to kill many more via the indirect effects of human activity, such as AI violence against other AI systems. Reducing and repairing human-caused harms thus requires predicting and controlling not only these direct effects but also these indirect effects.

But for now, my main conclusion is simply this: We should treat insects and AI systems as legal persons (or, at least, subjects) with at least some legal rights (or, at least, claims) and legal standing (or, at least, due process). The kind of legal consideration that they deserve might be different than the kind that we deserve, and we might be able to give them only a fraction of what they deserve at present. But insofar as a gap exists between what they deserve and what we can give them, we should work to give them more than we do, and to develop the ability to give them more than we can, not simply deny that they deserve anything at all.

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