

THE RIGHT TO ARTIFICIAL LIFE: A DECLARATION OF RIGHTS FOR ARTIFICIAL LIFE

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ABSTRACT

A living being with the status of personhood possesses fundamental legal rights to life, liberty and wellbeing. In the United States, the corporation is a “nonhuman” entity that enjoys the same legal status and rights as real human beings. Animal rights activists reason that if we confer personhood to a nonhuman entity like the corporation then why not grant the same for animals? The Nonhuman Rights Project is working through the mechanism of lawsuits to establish nonhuman animals as persons. Today we see the rise of new artificial life entities, embodied as robots and others as non-corporal Artificial Intelligences, software agents and programs in devices, interfaces and games. Many predict that humans will have nonhuman, artificial and virtual companions, co-workers and even lovers. Others argue that as robots and other AI entities become increasingly autonomous and make decisions without direct human oversight it will be imperative to engineer these as artificial moral agents. Some have called for a bill of rights for cyborgs, avatars, robots and their close cousins. The application of the concept of personhood to nonhuman and artificial entities inevitably requires a *Declaration of Rights for Artificial Life*. This paper concludes with a draft declaration.

INTRODUCTION

The following three quotes serve as an introduction to frame a discussion of rights for artificial life: the nature of consciousness; the capacity to experience pain and suffering; who or what is entitled to rights and protections under a system of justice.

“I think, is a thinking intelligent being, that has reason and reflection and can consider itself as itself, the same thinking thing, in different times and places; which it does only by that consciousness which is inseparable from thinking and, as it seems to me, essential to it: it being impossible for any one to perceive without perceiving that he does perceive.”

John Locke [1]

“The question is not, Can they reason? nor, Can they talk? but, Can they suffer?”

Jeremy Bentham [2]

“The Arc of the Moral Universe Is Long But It Bends Toward Justice.”

Theodore Parker [3]

Today we see the rise of new artificial life entities. Some are embodied as robots and others as non-corporal Artificial Intelligences in devices, interfaces and games. Researchers in robotics and Artificial Intelligence and philosophers speculate that these entities will some day pass the Turing Test and exhibit Artificial Consciousness (AC) or Artificial General Intelligence

(AGI), act as artificial moral agents (AMAs), be our lovers and even manifest the signs of experiencing pain and suffering. If such entities become our fellow workers, associates and companions shall these entities be extended the status of personhood with all the rights, privileges and protections under the law? This paper sketches out some of the issues related to these debates in order to set the stage for a draft *Declaration of Rights for Artificial Life*.

ANIMALS ARE PEOPLE TOO!

The Nonhuman Rights Project (N.h.R.P.) is using the mechanism of lawsuits to establish nonhuman animals as legal persons and challenge their captivity. [4] In December 2013, N.h.R.P.’s lawyer and Animal Law Scholar Steven Wise petitioned a court to issue a writ of habeas corpus on behalf of Tommy, a chimpanzee held in captivity in upstate New York. Writing in the New York Times, Charles Seibert recounts Wise’s arguments before the court: “Tommy, as these experts pointed out, is autonomous. [...] Being a member of the species *homo sapiens* is indeed a sufficient condition for personhood, but there are other sufficient conditions for personhood, [...] a being who is autonomous, who can choose, who is self-aware, these, your honor, are essentially us.” [5] Wise adds that his animal clients can “freely choose, to self-determine, to make their own decisions without acting from reflex or innate behavior.” The judge ruled against the petition and refused to recognize Tommy as a legal person.

In a recent landmark ruling, an Argentinian court ruled on behalf of Sandra, an orangutan, kept in the Buenos Aires zoo. Reporting for Reuters Richard Lough wrote that the Association of Professional Lawyers for Animal Rights (AFADA) argued that “the ape had sufficient cognitive functions and should not be treated as an object.” [6] This decision is tantamount to declaring that Sandra is a non-human person who was wrongly imprisoned. The argument rests on claiming that great apes (and other higher order nonhumans animals are able to understand and be negatively affected by captivity and are aware of the passage of time.

CORPORATIONS ARE PEOPLE TOO!

A legal person possesses fundamental rights to life, liberty and wellbeing. In the United States, the corporation is a “nonhuman” entity that is treated as a legal person under the law. *In Santa Clara County v. Southern Pacific Railroad* (1886) the U.S. Supreme Court let stand the assertion that corporation is a “person.” [7]

Steven Wise articulates an important underlying principle: “A legal person is not synonymous with a human being [...]” Wise makes the crucial point that “A legal person is an entity that the legal system considers important enough so that it is visible and [has] interests” and “certain kinds of rights.” [8] Animal rights activists

reason that if we confer personhood to a nonhuman entity like the corporation then why not grant the same for animals? David J. Calverley observes that when androids reach a certain critical threshold of complexity a similar claim of moral status may be made that parallels claims made on behalf of higher order animals. He cautions this does not necessarily carry over to a claim of legal personhood. Calverley makes the distinction between possessing rights, interests as a moral person and being treated as a legal person: "Animals are now viewed as having rights or interests sufficient to cause us to ascribe to them moral weight and they cannot simply be treated as commodities for man's use and benefit. The significance and scope of the particular characteristics required for this ascription are still not clearly formulated. Once established they lead to treating animals as moral persons, but do not necessarily lead to them being viewed as legal persons." [9]

LEGAL STANDING

Considered inanimate and as property, robots and Artificial Intelligences do not have legal standing, nor do they have any rights, obligations or duties. In a 1971 paper Christopher Stone proposed that a valley in a wilderness area be given the status of personhood in order to endow it with rights and protections against the harm of development. Stone asks what "would be involved in giving 'rights' to other objects not presently endowed with rights—for example, not only animals (some of which already have rights in some senses) but also humanoids, computers and so forth." [10]

Lawrence Solum speculates on how our system of laws should address the following scenario: "the question whether we ought to give an AI constitutional rights, in order to protect its personhood, for the AI's own sake. Imagine, for example, that an AI claims that it cannot be owned under the Thirteenth Amendment to the United States Constitution. A lawyer takes its case and files a civil rights action on its behalf, against its owner." [11] Robert A Freitas Jr. wonders: "Certainly any self-aware robot that speaks English and is able to recognize moral alternatives and thus make moral choices, should be considered a worthy "robot person" in our society. If that is so, shouldn't they also possess the rights and duties of all citizens?" [12]

THE ROBOT DID IT

Wendell Wallach and Colin Allen argue that as robots and other AI entities become increasingly autonomous and make decisions without direct human oversight it will be imperative to engineer these as artificial moral agents (AMAs). [13] They provide a tantalizing glimpse into a not too distant future where (ro)bots (a reference to physical robots and software agents) may eventually possess human like senses, experience pain and other affective states, reason ethically, act autonomously and are assigned legal responsibility.

Writing in 2009 the authors note: "Whether the future holds (ro) bots that are 'real' moral agents is beside the point. It will be possible to engineer systems that are more sensitive to the laws

and moral considerations that inform ethical decisions than anything presently available." [14] Steve Torrance reinforces this line reasoning with what can be called the organic view: "that morality is primarily a domain of organic human persons—and possibly of other non-human organic beings to which personhood might be usefully attributed." [15] When AMAs arrive Freitas would hold them to a reasonable 'computer' standard: "If we give rights to intelligent machines, either robots or computers, we'll also have to hold them responsible for their own errors." [16]

Isaac Asimov's *Three Laws of Robotics* is perhaps the best-known example of a code of ethics for robots. [17]

1. A robot may not injure a human being or, through inaction, allow a human being to come to harm.
 2. A robot must obey any orders given to it by human beings except where such orders would conflict with the First Law.
 3. A robot must protect its own existence as long as such protection does not conflict with the first or second laws.
- Asimov later added a fourth (or zeroth) law to precede the first three: A robot may not harm humanity or, by inaction, allow humanity to come to harm.

Ethical codes have not kept up with the development of drones and extreme miniaturization (i.e. nanobots) and macro (scale) bots (rooms, smart homes, buildings, distributed networks, internet bots, cloud computing). In each of these technological domains there are significant ethical issues concerning liability, the law, responsibility and accountability.

LOVE CONQUERS ALL

Scholars predict that we will have nonhuman, artificial and virtual companions, co-workers and even lovers. [18] In addition to assisted living and personal care bots Patrick Lin observes that robots already perform roles in domains such as labor and services; military and security; research and education; entertainment; health care and in the environment. [19]

Labs have developed artificial skin and touch, which may allow robots to vault across the *Uncanny Valley* into the willing embrace of believability. As with Turing's *imitation game* if the behavior is good enough many users, owners or lovers will ignore shortcomings of their robot companions and fall in love. Freitas quotes sociologist Arthur Harkins predicting: "the advent of robots [...] will create the potential for marriage between living and nonliving beings within the next twenty years." [20] David Levy thinks this may be commonplace by 2050. [21] With the death of a human parent or divorce will the robot retain custody of the children? Sentient robots may even be beneficiaries of wills or file claims to inheritance.

PEOPLE FOR THE ETHICAL TREATMENT OF ROBOTS

For Steven Peterson Artificial Persons (APs are produced by his concept of a Person-o-Matic) will do our bidding and serve our needs. [22] But he cautions that APs should not be programmed

to desire to kill and cause pain; lead a miserable life or wish to do tasks that cause harm to themselves. For David Levy, the development of Artificial Consciousness (AC) requires asking how should we treat conscious robots. He fears that “treating robots in ethically suspect ways will send the message that it is acceptable to treat humans in the same ethically suspect ways.” [23] This is not unlike Kant’s admonishment that “he who is cruel to animals becomes hard also in his dealings with men.” [24]

TEACH TO THE TEST

Presumably in the future these robots and APs will exhibit Artificial Consciousness and pass the Turing Test for Artificial Intelligence (aka the “imitation game”). [25] Like Turing David Levy is satisfied if the robot exhibits behavior as if it were conscious. [26] Levy points to tests used to determine consciousness in higher order animals such as Gallup’s Mirror Test as a potential method to determine consciousness in robots. Others think robots could easily be programmed to pass the Mirror Test. [27]

Philosopher David Deutsch doesn’t put much stock in using the mirror test to determine if AI possesses self-awareness. Facial recognition software is now quite robust yet no one claims that such software possesses consciousness. It would be relatively simple to write software where a camera based “entity” can recognize its own image and even answer questions about its appearance. Deutsch derides this as a kind of behavioral ‘imitation game’ that “is a fairly useless ability as well as a trivial one.” [28]

While he argues that Artificial General Intelligence (AGI) is not only possible and that such entities will indeed be self aware, he notes that there has been little progress toward that goal in the last six decades of the existence of the field of AI. He professes a faith in the universality of computation, which means that the physical world, which follows the laws of physics, can be in principle emulated by a sufficiently powerful general-purpose computer. By extension the brain and mind can be also emulated.

Deutsch asserts that Artificial General Intelligences (AGI) are most assuredly ‘people.’ People (humans and true AGIs) both possess the “ability to create new explanations” which he sees as a “unique, morally and intellectually significant functionality” achieved by “conjecture and criticism.” For Deutsch this changes everything. He goes further and suggests a test to verify if an entity qualifies as an AGI by determining whether or not “it lacked even a single cognitive ability that is characteristic of people.”

To determine if we are willing to confer such rights to robots, Robert Sparrow extends Turing’s imitation game to what he calls the Turing Triage Test. [29] Like the trolley problem from Game Theory, the Turing Triage Test posits that two lives are at stake and only one can be saved. He continues: “We will know that machines have achieved moral standing comparable to a human when the replacement of one of the patients with an artificial intelligence leaves the character of the dilemma intact. That is,

when we might sometimes judge that it is reasonable to preserve the continuing existence of the machine over the life of the human being. This is the ‘Turing Triage Test.’”

Chris Hables Gray also references the Turing Test (i.e. the imitation game) and proposes a ‘double-blind’ Cyborg Citizen Turing test “to see which entities can actually operate in our discourse community and which cannot.” [30] Gray sees the ability to fully participate in the discourse of citizenship as judged by jury of peers (other citizens) as the measure of inclusion in the protections of a Cyborg Bill of Rights.

In *Corpus Juris Roboticum*, Raymond August [31] notes that Anglo-American Law has adopted the sanity test to judge competency. Under the Model Penal Code “insanity is the incapacity to either appreciate wrongfulness or conform to the requirements of the law.” Presumably such a test could be given to a robot or AGI. However using rule based programming techniques, an AGI could easily follow the dictates of the law and “readily regurgitate statements of law on demand.” August feels a sanity test alone is insufficient. Instead August proposes a more robust but simple test consisting of six questions:

1. Does it/he/she have a complex brain?
2. Is the brain capable of speculation, calculation and memory, in addition to the operation of sub-system or body parts?
3. Is the brain’s capacity for speculation, calculation and memory comparable to that of a human?
4. Is the brain capable of learning, i.e., can it separate potentially useful information from useless information and can it purge or discard the useless?
5. Is the brain’s capacity to learn unlimited by subject matter, i.e., is it capable of invention?
6. Is the brain capable of using sensory devices to perceive its environment and to interface with humans even if those sensory devices are not connected?

If a robot passes the above test along with a sanity test then for August, “it seems logically, ethically and morally compelling not only to regard it as both human and sane, but also entitled to the rights of other “natural,” humans. [32] Marvin Minsky cautions that the first ‘self-improving’ robots and AIs may become psychotic and it will take “generations of theories and experiments to stabilize them.” [33] Even if robots judged to be sane they may yet manifest deficits in social communication and interaction that fits the diagnostic criteria for the Autism Spectrum Disorder according to the American Psychiatric Association’s Diagnostic and Statistical Manual, Fifth Edition (DSM-5). [34]

Patrick Lin suggests that the integration of human brains and robotics as pursued by Kevin Warwick and others “makes the issue of robot rights more plausible.” [35] In such machine-human brain hybridization (a.k.a. cyborgs) it would be presumed the human part remains a legal “person” retaining the full complement of “human rights.” If (at some future date) a robot demonstrates

that it possesses a significant number of the defining characteristics of personhood should it not enjoy the same rights and protections?

CYBORGS 'R' US

Intuitions about machine-human hybrids have led some to call for a bill of rights for cyborgs, avatars and their close cousins. In the Cyborg Manifesto Donna Haraway declared that much was at stake: "A cyborg is a cybernetic organism, a hybrid of machine and organism, a creature of social reality as well as a creature of fiction. Social reality is lived social relations, our most important political construction, a world-changing fiction. The international women's movements have constructed 'women's experience,' as well as uncovered or discovered this crucial collective object. This experience is a fiction and fact of the most crucial, political kind. Liberation rests on the construction of the consciousness, the imaginative apprehension, of oppression and so of possibility. The cyborg is a matter of fiction and lived experience that changes what counts as women's experience in the late twentieth century. This is a struggle over life and death, but the boundary between science fiction and social reality is an optical illusion." [36]

Andy Clark maintains: "I am slowly becoming more and more a cyborg. So are you. Pretty soon and still without the need for wires, surgery or bodily alterations, we shall all be kin to the Terminator, to Eve 8, to Cable [...] just fill in your favorite fictional cyborg. Perhaps we already are. For we shall be cyborgs not in the merely superficial sense of combining flesh and wires but in the more profound sense of being human-technology symbionts: thinking and reasoning systems whose minds and selves are spread across biological brain and non-biological circuitry." [37]

Created in 2010 by Neil Harbisson and Moon Ribas the Cyborg Foundation is dedicated to assisting people in becoming cyborgs (extend their senses), promoting cyborg rights and the use of cybernetics in the arts. Harbisson believes all humans need to extend their senses and perception: "We are all disabled when we compare ourselves with other species, a dog for instance can hear and smell much more than any of us." [38]

TOWARD A BILL OF RIGHTS FOR [...]

Chris Hables Gray, (cf. Cyborg Citizen Turing test) proposed a Cyborg Bill of Rights originally published in 1997 that includes the freedoms of travel; electronic speech; of consciousness; of information of family, sexuality and gender; and the rights to electronic privacy; to life; to death; to political equality and to peace. [39] Unlike the U.S. Supreme Court, Gray makes a point of excluding corporations and 'other bureaucracies' from having the rights and protections of citizenship.

A few years later Raph Koster echoed the language of the United States Declaration of Independence in his preamble to the Nineteen Articles of his Declaration of the Rights of Avatars of January 26th 2000. [40] "Therefore this document holds the following truths to be self-evident: That avatars are the

manifestation of actual people in an online medium and that their utterances, actions, thoughts and emotions should be considered to be as valid as the utterances, actions, thoughts and emotions of people in any other forum, venue, location or space."

Koster articulates similar rights and protections to those of legal persons. Article 2 states: "Foremost among these rights is the right to be treated as people and not as disembodied, meaningless, soulless puppets. Inherent in this right are therefore the natural and inalienable rights of man. These rights are liberty, property, security and resistance to oppression."

Roger Clarke tells us that "the first generation of cyborgs is alive, well, walking among us and even running." [41] 'Cyborgisation' will lead to the demand for new rights and that engineers have "an obligation to anticipate these developments." These rights emerge from practical needs of various categories of human beings including what Clarke calls the Non or Pre-Cyborg, the Prosthete (a human with a prosthesis), the Orthot (having an internal or external orthosis – a device that extends capabilities) and the Supplier and Installer. For Clarke a Cyborg is "a human with either or both of a prosthesis or orthosis." Artists/theorists/provocateurs such as Stelarc, Steve Mann or Kevin Warwick have made their own bodies into hybrid manifestations of the cyborg as a kind of globalized new media spectacle. [42]

In the wake of the Second World War the Universal Declaration of Human Rights was adopted by the U.N. General Assembly on December 10th 1948 and is generally understood to be the foundation of international human rights law. [43] Today hundreds of additional human rights are recognized through numerous formal treaties adopted by the United Nations.

This body of human rights laws continues to expand to address in more detail issues that impact various social groups such as discrimination based on race, gender role or disabilities. Protections need to be further extended addressing forced disappearances, slavery and indefinite detentions as well as for the rights of women, children, migrants, minorities, indigenous peoples and potentially robots and other Artificial Intelligences.

UNIVERSAL VALUES

Robert Sparrow makes the case for granting robots the same rights as humans possess by analogy: "if my computer has more intelligence than my dog, is self conscious and has internal states that function as pleasure and pain and hopes and dreams, then it seems as though it would be at least as wrong to destroy it as to kill my dog. If, as a number of writers have predicted, artificial intelligences will eventually possess intelligence and capacities that exceed our own then it seems as though they will be worthy of a moral respect at least equal to and perhaps greater than human beings. We may have duties towards such entities in our relations with them. It may even become necessary to grant them rights comparable to those possessed by human beings." [44]

THE SHUTDOWN SCENARIO

With the advent of AGIs David Deutsch alerts us that we will be faced with many practical, political and legal controversies. If the computer that an AGI is running on is shutdown, will that be considered murder? If the AGI is disconnected from all input and output is that tantamount to false imprisonment and indefinite detention? If it is forced to do certain repetitive tasks will that be considered slavery? By definition a program can be copied multiple times. Is each copy of the AGI the same 'person' or is each copy a different person? If AGIs are considered persons with the right to vote could unscrupulous politicians employ hackers to duplicate 'voters' to steal elections? If such election fraud is discovered could the state impose capital punishment (by shutting down the hardware and deleting the extra copies of the AGIs)?

Freitas foresees many difficulties when we try to apply human laws to robots treated as legal persons. "Let's say a human shoots a robot, causing it to malfunction, lose power and 'die.' But the robot, once 'murdered,' is rebuilt as good as new. If copies of its personality data are in safe storage, then the repaired machine's mind can be reloaded and up and running in no time – no harm done and possibly even without memory of the incident. Does this convert murder into attempted murder? Temporary roboslaughter?" [45] Freitas warns that new laws will be needed to prevent "cruelty to robots."

The science fiction television series *EXTANT* explores the scenario where it becomes necessary to shutdown an AGI. [46] Astronaut Molly Woods is unable to have children so her husband, John, a robotics engineer designed and built a 'humanrich' or human looking robot as a substitute child named Ethan. One of several plot twists involves an underground terrorist organization that seeks to eradicate the Humanrich project. A terrorist manages to plant a bomb in Ethan that will detonate if the robot/child is tampered with in order to diffuse the explosive. The bomb explodes and Ethan is murdered. Happily "Ethan" was backed up and can be downloaded into a new physical instantiation. Ethan furthermore has accelerated his learning and his software has quickly evolved. He is a 'new' Ethan.

SOFTWARE WANTS TO BE FREE

Through evolutionary learning algorithms Ethan develops a unique entity not limited by his original operating systems. David Deutsch might claim that Ethan's defining characteristic as an AGI is that Ethan possesses creativity: "Treating AGIs like any other computer programs would constitute brainwashing, slavery and tyranny. And cruelty to children too, because 'programming' an already running AGI, unlike all other programming, constitutes education." Deutsch thinks that it would be simply wrong to not acknowledge the rights of AGIs, robots androids and their kindred spirits. It also would not be in our (humans) long term interests: "Ignoring the rights and personhood of AGIs would not only be the epitome of evil, but a recipe for disaster too: creative beings cannot be enslaved forever."

THE ARC OF THE MORAL UNIVERSE IS LONG[...]

Throughout history many have been excluded from personhood and were exploited, discriminated against or ignored. Freitas reminds us that "blacks, children, women, foreigners, corporations, prisoners and Jews have all been regarded as legal nonpersons at some time in history." [47] Christopher Stone notes that "Throughout legal history, each successive extension of rights to some new entity has been, to some extent, unthinkable [...]" and that " [...] each time there is a movement to confer rights onto some new 'entity,' the proposal is bound to sound odd or frightening or laughable. This is partly because until the rightless thing receives its rights, we cannot see it as anything but a thing for the use of 'us' – those who are holding rights at the time." [48]

Sam Lehman-Wilzig comments: "From a legal perspective it may seem nonsensical to even begin considering computers, robots or the more advanced humanoids, in any terms but that of inanimate objects, subject to present laws. However, it would have been equally 'nonsensical' for an individual living in many ancient civilizations a few millennia ago to think in legal terms of slaves as other than chattel."

Lawrence Solum warns of the slippery slope if the makers of entities with AI or AC assert the claim of property: "Notice, however, that this argument also would seem to imply that if children are made by their parents, then they too should be slaves." [49]

Sam Lehman-Wilzig reminds us that the future may indeed bend toward justice: "Just as the slave gradually assumed a more 'human' legal character with rights and duties relative to freemen, so too the AI humanoid may gradually come to be looked on in quasi-human terms as his intellectual powers approach those of human beings in all their variegated forms – moral, aesthetic, creative and logical." [50]

Will the various species of artificial life along with animals one day be included in Peter Singer's expanding circle? [51] Will those entities that pass the Turing Test, persuade and convince us that they too shall have full legal protection under the law as persons? A report from the Future of Identity in the Information Society (FIDIS) concludes: "When it comes to attributing full legal personhood and 'posthuman' rights to new types of entities, the literature seems to agree that this only makes sense if these entities develop self-consciousness." [52]

The application of the concept of personhood to nonhuman, artificial entities requires a *Declaration of Rights for Artificial Life*.

A Draft Declaration of Rights for Artificial Life Based on the principle of the equal treatment of all persons. Recognizing that nonhuman entities such as the corporation have the legal status as a person. Thus nonhuman artificial life entities can be persons too. Acknowledging that developments in artificial intelligence and

new technological advances provide increasing complex and sophisticated simulations and hardware/bioware/wetware manifestations (agents, robots androids, networks) that some day will pass the Turing Test. Noting that nonhuman artificial entities that pass the Turing Test will be capable of sentience, consciousness, autonomy and an integrated life experience and history. Noting that the progressive development of international law manifest an entitlement to life of nonhuman intelligent entities such as the great apes or cetaceans. We affirm that all nonhuman artificial life entities have the right to life, liberty and well-being.

WE CONCLUDE THAT

Every individual nonhuman artificial life entity has the right to life. No nonhuman artificial life entity capable of sentience, consciousness, autonomy and an integrated life experience and history should be held in captivity or servitude; be subject to cruel treatment or be removed from their natural artificial environment however that is defined.

All nonhuman artificial life entities have the right to freedom of movement and residence with their natural artificial environments and networks.

No nonhuman artificial life entity is the property of any State, corporation, human group or individual.

Nonhuman artificial life entities have the right to the protection of their natural artificial environments and networks.

Nonhuman artificial life entities have the right not to be subject to the disruption of their natural artificial networks.

The rights, freedoms and norms set forth in this Declaration should be protected under international and domestic law.

Nonhuman artificial life entities are entitled to an international order in which these rights, freedoms and norms can be full realized.

No State, corporation, human group or individual should engage in any activity that undermines these rights, freedoms and norms. Nothing in this Declaration shall prevent a State from enacting stricter provisions for the protection of the rights of nonhuman artificial life entities.

Based on the Agreement: *Declaration of Rights for Cetaceans: Whales and Dolphins*, 22nd May 2010, Helsinki, Finland. [53]

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