non human:

the creator + the designed.

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"One child works out clever ways to arrange some blocks in rows and stacks; a second child plays at rearranging how it thinks. Everyone can praise the first child's castles and towers, but no one can see what the second child has done, and one may even get the false impression of a lack of industry. But if the second child persists in seeking better ways to learn, this can lead to silent growth in which some better ways to learn may lead to better ways to learn to learn."

Marvin Minsky from "The Society of Mind"

Anecdote from the Little Ones : An Introduction.

In 2010, Dario Floreano and Laurent Keller presented their research titled, *Evolution of Adaptive Behaviour in Robots by Means of Darwinian Selection*. The study involves an experiment which successfully illustrates altruistic cooperation in a team of miniature robots after 240 generations of Darwinian selection. In the joint evolution process of their artificial brain morphologies, the robots exhibit a cooperative behavior that amused their human observers: multiple robots team up to push the larger token, thereby increasing the fitness level of all group members (by one unit each) as opposed to one robot pushing a small token and singularly gaining one unit for itself.

The robots, once crude bits of metal and bits, were designed and assembled by the humans to perform certain necessary tasks. Upon successive iterations, they "learned" the consequences of their movement patterns and collectively showcased a reaction. The observation gathered from this alludes to an interesting teleological effort behind human robot interaction where there exists " a level of co-operation…while creating an ontological uncertainty as to their nature and intentionality" (Vidal, 2007).

I would suggest that this form of research is emblematic of the second child mentioned in Minsky's quote, the one playing at rearranging how the blocks *think* independent from our subjective intuitions. The blocks and their implications are presumably simple - they can be arranged in rows and stacked. Similarly, the understanding of the collective benefit in altruism and cooperation is universally affirmed. Hence, Floreano and Keller's extensive research with evolutionary robot behavior is indicative of our inquisitive drive to constantly understand and learn the mind at work - the ontology of its volitions. By projecting what is internal and bestowing its qualities onto an external object, in this case - robots, we produce a simulation that attempts to decipher the teleology of our innate dispositions. This interpretation becomes more plausible when we revisit the ways in which humans have established relationships with the "non-human" in the past as well as the present, prevalently through anthropomorphism. Within the last decade, researchers in the field of robotics and computer science have revisited anthropomorphism for its profound reassessment where, "it appears to be the most efficient and most spontaneous register through which humans establish - consciously or not - a strong relationship with artifacts or other non-human living beings" (Vidal).

This essay expands upon how HRI is an evolutionary consequence of anthropomorphism that transpired from its spiritual precedents. By approaching the topic of human and robot relationships from a cultural, anthropological, and even philosophical perspective, we inquire deeper into the relationships between subject and object as well as subsistence and existence[1]. I would then propose further in the preceding pages, how the relational paradox within HRI is reshaping the providence of a modern *creator* who stands on the cusp of immanency and paralysis.

Interacting with Invisible Forces

Denis Vidal draws a provocative comparison in an article written for the *Journal of the Royal Anthropological Institute* in 2007 where she contrasts the relationship between humans and gods to that of humans and robots. She explains that the visual, symbolic embodiment of the deity,

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[1] In James Williams' book, *Gilles Deleuze's Philosophy of Time: A Critical Introduction and Guide,* the way in which Deleuze distinguishes existence and subsistence is explained as follows: the former is reserved for actual things and their existence as causes; the latter is reserved for infinitives or ways of pure becoming and their subsistence as effects (149).

usually in the form of a statue, defines the anthropomorphic character behind rituals. Similarly, one can read the robot as a representational vestige for intangible cognition that is anthropomorphized. One example Vidal provides is the Himalayan trance ritual where the spirit of the deity is manifested through a person chosen as the *medium.* Whereas the spirit of the deity is incarnated through the medium's enactment during possession, curiosities of the human cognition is bred through the mechanics of the robot. Mediums in both cases present a duality where they either enact or become their manifestations, varying on the perception of the viewer. The conjunction-dissociation between the forces of exteriority and internality, arouses many questions regarding true agency and control over the medium itself.

Viewed in a Heideggerian perspective, matter itself has a dictate in the absence of a central agency, thereby making the subject and object dyad rather obsolete. This framework proposes a non-hierarchical understanding of human and robot interaction where the order and meaning of the object (matter) may emerge without the manipulation from the subject (form). In a conventional model, the subject prescribes cognitive representations of reality to the object so that it functions as a form of external memory device. Consequently, when distanced from the implication and meaning of its conducting subject, the robot subsists - "without forming an explicit internal symbol to stand in for that pattern of the outside world" (Wambacq) and will instead present an alternative configuration to the environment. Judith Wambacq expands upon this theory by referencing instances within behavioral AI where "the exclusion of (human) reflection, and hence of rather fixed beliefs about the world, in combination with the ever-changing environmental circumstances as the only source for knowledge (robot), render this model to a very dynamic representation of the brain." In this context, the results of human robot interaction conceives a form of hybrid that leverages the capacity of the *mind* beyond our definition.

With developing interests in the interdisciplinary field of developmental psychology and computing sciences, "robots are equipped with sensory and motor capabilities that allow them to exist in the physical world of the humans that they can interact with" (Ford, Warneken, 2009). More importantly, in order to facilitate the theoretical and experimental research in developmental psychology, robots are implemented with the intentional state, similar to that of humans, where they "share motivation to cooperate: to share mental states, including goal-based intentions which form the basis of cooperation"(Tomasello et at al. 2005). The endurance of teddy bears is a testimony to how the developing brain of a child relates to the stuffed animal as a response to physical and psychological anthropomorphism of the bear. Therefore, when designing a model where the objective is to make it relatable and responsive, it is often anthropomorphized - with facial features for expression, hands for contact, etc. Not only is anthropomorphism a way in which robots are designed to emulate "human-like" experiences as an integrated social participant, it is a psychological phenomenon where we externalize our interiors onto the robot itself, making it a component and extension of ourselves.

Manfred E. Clynes and Nathan S. Kline, researchers at Rockland State Hospital during the late 50s' have said: "In the past, the altering of bodily functions to suit different environments was accomplished through evolution. From now on, at least in some degree, this can be achieved without alteration of heredity by suitable biochemical, physiological, and electronic manipulation of man's existing *modus vivendi."* The proposed "modus vivendi" or the coexistence of two conflicting temperaments - man and machine, artificial and organic, has been an ongoing discourse spanning various shifts within the cybernetic episteme. Nicholas Negroponte's 1969-70 project: *Seek,* highlights how the Architecture Machine Group at MIT were attempting to expand the concept of the computer controlled environment from something obsolete to something rather visceral. The

project visually animates how the assertion of "the potential primacy of external control systems," configures with the "the body's (the computer controlled environment) internal functioning" (Clynes and Kline). As the inhabited gerbils continuously alter the positioning of their "blocksworld," the robotic arm attempts to mimic the gerbil's objectives by rearranging the blocks, resulting in a cerebrally linked, cooperative building environment between the gerbil and the computer controlled machine arm. Negroponte's research not only portrays a poetic instance of "modus vivendi" but also raises to the surface the inseparable existence of the exterior and interior.

What does this cooperation entail teleologically? To what extent will the shared experience of the the human and non-human continue and at which point will they start to obscure one another? With questions like these, a whirring dissonance shrouds over the intention of the creator and the temperament of the designed.

Posthuman Stasis: Immanency and Paralysis

"The modern masters promise very little; they know that metals cannot be transmuted and that the elixir of life is a chimera but these philosophers, whose hands seem only made to dabble in dirt, and their eyes to pore over the microscope or crucible, have indeed performed miracles. They penetrate into the recesses of nature and show how she works in her hiding-places. They ascend into the heavens; they have discovered how the blood circulates, and the nature of the air we breathe. They have acquired new and almost unlimited powers; they can command the thunders of heaven, mimic the earthquake, and even mock the invisible world with its own shadows."

-Frankenstein, Mary Shelley 1818-

In theory, the world of non-human and the world of humans can be distinguished perhaps as the world of science and the world of politics. Accordingly, nature can be classified as a transcendence that is not of human creation while society is an immanent fabrication of the human kind. As described by Wambacq's segment on Bruno Latour, "The mere transcendence of a nature not of our creation, and the mere immanence of a society, entirely of our creation, would have paralyzed modern man because it would render him completely powerless in relation to nature, and too powerful in relation to society." Yet, the world has become a quasi-realm where everything is held in suspension as hybrids, the immanent and paralyzed creator is obsolete when the polarity between subject and object seize to exist. The modern creator floats in space wherein "cryogenically preserved embryos, genetically modified soy beans and artificial neural networks blur the boundaries between natural and the human"(Wambacq).

Throughout human history, particularly in the arts and sciences, the dominant domain of authorship and providence asserted much of the intent behind creation. This is illustrated in narratives that trace back to Greek mythology about Prometheus, the thief of fire[2] as well as Mary Shelley's novel and its protagonist Victor who is driven mad by his quest to unlock the ontology of life[3]. What has been revealed over time, is that the theoretical presence of the creator is a blinding obstacle where

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[2] Prometheus is a demigod of the Titans, worshipped by craftsmen. According to the mythology, Prometheus stole "fire" from Zeus who had hid this valuable element from mankind for its divine powers and attributes. The return of fire on earth allowed humans to own a powerful, god-like tool. I use this as a reference to demonstrate how people have created distinctive narratives around the ownership of such element between the divine and the mortal.

[3] The story of Frankenstein's monster has much to do with the literary significance of anthropomorphism as the complete authorship and hubris that is presented through Victor's character who is power hungry for a form of omnipotence where creation surpasses his human quality and transcends him to a divine status.

one disregards the potential within subsistence - rather, the object must be overseen by the subject in order to be substantiated. I would propose that this is mainly due to the possessive grip over the concept of anthropomorphic embodiment, trickling down from the very biblical reference where man is made in the image of god and thus rendered sacred.

However, the ultimate picture becomes more and more evident, as envisioned by AI researchers like Hans Moravec, that this idea of embodiment dissipates in the absence of the physically embodied mind as it subsists. People like Moravec, imagines a way "to make the Cartesian metaphor of the mind divorced from the body a literal reality by taking the human mind out of the brain in what he calls the 'post-biological." He postulates that eventually it will be possible for "human mental functions to be surgically extracted from the human brain and transferred to computer software through a process he calls 'transmigration'"(Abbas). This sort of science fiction[4] reality is foretelling of the "teleological effort" where the overlap between the intension of the creator and the temperament of the designed gives way to a post-human construct. However, in order to metabolize this concept, one must abandon all historically specific construct of what it means to be human and embodied forms of subjectivity, but instead recognize the disembodied entities that humans have become during the eras of our cybernetic partaking.

From the perspective of the post-human, anthropomorphism unfolds in a unique twofold: First, the psychological anthropomorphism and its affect on projection and simulation, creating a non-hierarchical platform where humans vicariously experiment developing systems and its physical environment. In another words, the anthropomorphic qualities of the machine allow humans to extend interior motives and manifest them externally via the objective device. This attempt blurs the hierarchy of object and subject because it envisages a fragment of our internal identity in the most psychological way- almost in the idea of a "horcrux.[5]" Secondly, the machine becomes a prosthetic-like extension: an additional limb or sense, providing feedback via its similar human experience of tactile contact and stimuli from the environment.

The Nirvana of a Buddhist Robot : A Conclusion?

Denis Vidal argues that religion, contrary to its reputation for confining a rigid definition of human nature, actually provides the very opposite. Particularly, within religious traditions which "constitute one of the most significant fields of human experience where the specificity of human nature is frequently disputed." Vidal goes on to quote, "It is also a domain of culture where one of the cherished ideas of many roboticist - such as the idea that human-like characteristics might equally be found (or eventually emerge) in non-human creatures and artifacts."

The robot portrayed in the 2012 Korean anthology film, *Doomsday Book* by Pil-Sung Yim, Jee-Woon Kim, is physically reminiscent of any prominent apple product. The pristine, white plastic surface of the robot's exterior glistens under the gold emblazoned temple of the buddhist

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[4] Author Philip K. Dick explored philosophical, sociological, political and metaphysical themes in novels dominated by monopolistic corporations, authoritarian governments, and altered states of consciousness. In his later works, Dick's thematic focus strongly reflected his personal interest in metaphysics and theology. [also see: Bernard Wolfe's *Limbo*]

[5] In JK Rowling's novel, a relevant metaphor in a form of children's fiction is presented in a passage where Horace Slughorn provides a definition of a mysterious edifice of the magic world: "A Horcrux is the word used for an object in which a person has concealed part of their soul... Well, you split your soul, you see, and hide part of it in an object outside the body. Then, even if one's body is attacked or destroyed, one cannot die, for part of the soul remains earthbound and undamaged."

monastery. The robot is a high monk at the monastery awaiting its *termination* the next morning. In its expressionless desperation, the robot mutters incantations "from where have I come, and to where do I go? Upon the arrival of the "executioners" the following day, the experience of the story transcends at the same moment the robot monk reaches complete clarity- a state of nirvana. Gazing at the humans with his blue L.E.D lit features, the robot stands in front of the golden buddha statue, aligning with the sun mandala crowning over his plastic skull. It asks, "Why do you believe that only a robot can be awakened at creation? The question of my awakening does not affect this complete world." At last, the robot monk slowly sits in lotus position and quietly self terminates in meditation pose.

The particularly interesting caveat to this film is the level of empathy the robot monk provokes from the dialogues. In contrast, the humans in the film are rather cold and objective; speaking in monotones and citing from a veiled source of social pedagogy that exists outside the temple. As the voyeur, one cannot help but be confounded by the convincing bias in favor of the robot's morality and faith over the unknowing masses represented by the humans. The meaning of human, non-human, humanoid, humanlike, blurs from this perspective and the character is no longer a buddha, robot, but a *being*. The matter and form no longer exist or coexist. The objects is no longer an object and the subject no longer a subject. This sort of rhetoric in the film is an effective prelude to many post human theories. One reference in particular is N. Katherine Hayles, author of *How We Became Posthuman : Virtual Bodies in Cybernetics, Literature, and Informatics,* where she writes "There are no essential differences or absolute demarcations between bodily existence and computer simulation, cybernetic mechanism and biological organism, robot teleology and human goals."

The blind perception of a "permanent truth," that the character is either a robot or a buddha, hinders the conception of an alternative, where the subject and object both transcend each other by their focus on *being* (Heidegger,1994). The dissonance that has often been associated with this concept of artificial existence is perhaps a pertinent reflex where the inhuman qualities we connotatively prescribe, nonetheless reflect back, to indicate what qualities *truly* make up a human. By having context of what we may not be, we are *re*-presented with preexisting notions of what we may be, providing a repose where we can meditate on the implications of this dichotomy. As Wambacq summarizes Heidegger's critique on this topic, "being, in other words, bridges the gap between subject and object. Or rather, in the light of being, there has never been a separation between the two."

A prominent theme within conceptions of the posthuman is the idea of disembodied immortality and unlimited capacity. There is no longer the blurring of the robot and the human because the medium and the element, matter and form, object and subject have merged into essentially one being. Yet, what leverages this concept is not merely the artifactual efficacy of the sciences or the cultural and social representations of technological innovations, but rather, the celebration of the finitude human condition that exists symbiotically within embodied and disembodied states of being (Abbas, 1999).

Philosopher Gaston Bachelard once said, "It is better to live in a state of impermanence than in one of finality." As it has been the abstract through the short breadth of this paper - the essence of *being* in its constructed and continuously embodied state, that be within a machine or the corporal, cannot exist in such locked stasis. There is a constant volition that triggers intangible forces within the living that subsists- absent from control or any form of dictate. I would summarize broadly, through personal observation and hypothesis, that the teleological effort within human

robot interaction is very much a "search in motion" where the *mind* is simply finding another host or fabricating a new architectural form to inhabit. The human or the non-human cannot know the intention behind this search but all are very much *aware* of the tendency that continues to drive forth this motion. That is, as Hayles explains, the celebration of a finitude condition, that recognizes the human within a material world of great complexity, "one on which we depend for our continued survival."

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