



The Old Doom of a New Technology

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Abstract

Why do roboticists not content themselves with constructing useful machines, rather than also trying to endow them with anthropomorphic forms, even at the risk of compromising their functionality? What drives them to cover their machines with a latex coating to simulate human skin? The utopia of the creation of a double appears also in the world of art, the history of which shows, above all, an outcome that coincides with the abandonment of the naturalistic imperative, and the inauguration of various periods of exploration and innovation. That is why a possible Robo-aesthetics – i.e., robotics and aesthetics combined – could give rise to a new scenario which, acknowledging the radical novelty of the species introduced, would induce the adoption of a new observation level, constructed on the basis of a common project.

The Utopia of The Double

With the construction of automata, mankind creates a projection of his own nature, generating artificial objects crowned, at times, with remarkable success, but often also with inevitable failure. For example, the use of wax – a malleable material par excellence – has been proposed as an expressive modality in the art world since the 13th century and they made impression even to Giorgio Vasari (Vasari, 1963:230) who saw them in the shop of Andrea Verrocchio. But they got rather limited success, presumably owing to its ambivalent effort to surpass the limits of symbolic representation only to reach or remain on the level of the most uncompromising realism. Subsequently, the unnerving wax – which, while capable of fooling the eye, also celebrated death – was replaced by ever-more-refined materials and technologies, enabling the construction of automata that seemed to give the illusion of transcending the very limits of man's physical existence. Indeed, the step from wax statues to automata is shorter than one might think. Julius Schlosser in the fourth chapter of his *Histoire du portrait en cire*, notes a clear similarity in the motivations underlying both types of production [1]. They share, indeed, the same fault: a naïve realism and power of illusion that are impressive rather than expressive, thus inevitably sealing their fate (Figure 1). The literary world has always provided great support for such ventures, on the one hand descriptively

anticipating the physical configuration that automata could have assumed, but, on the other, almost always emphasizing the indisputable superiority of their creator over them, because man, unlike any automaton, possesses a soul. Being soulless renders the automaton a total slave to human desiderata, to the extent that it is man who is the undisputed arbiter of the machine's destiny, and who can freely decide to inflict upon it a paradoxically tragic and violent 'human' end. The three-century-old legend of the Golem of Prague, wrought from clay and supernaturally brought to life, has taken on an extraordinary current-day relevance; and technology not only seems fearless of ethical judgments, but also aims to produce robots (our modern-day automata) that put themselves forward as human doubles, perhaps to respond to the latent desire for perfection to which man has always aspired. However, if the written word continues to sustain the idea of man's superiority over his 'creatures', technology goes beyond this idea, intuitively sensing that, thanks to man's automata, it is perhaps becoming possible to appease the ancestral call for immortality and perfection. If, in the world of fiction, man is redeemed thanks to an undeniable chance series of events, technology remains untouched by problems of a metaphysical nature. Such issues as self-awareness and free will are irrelevant: automata are a truly favorable opportunity, not

least because death and disease cannot touch them, because their inability to procreate keeps them, in some way, distant from either life or death.

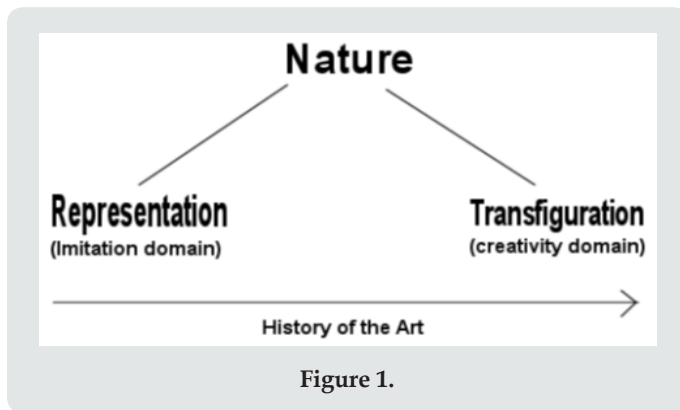


Figure 1.

There is one thing, however, that literature and technological reality have in common: they share the conviction that it is worth our while to attempt to repeat the history of the world, at an accelerated rate, trying not to omit anything essential. The risk of failing in the enterprise is evidently not a sufficient obstacle or deterrent to induce surrender. Whereas, in the 18th century, in addition to the disconcerting wax statues, there were artificial or 'humanoid' beings whose souls remained firmly in the hands of their creators, today's roboticists design and construct robots that come very close to resembling human beings, in the attempt to endow them not with souls but with the greatest possible autonomy of thought. In fact, current-day anthropomorphism is becoming ever more demanding and ambitious in its production: it has now succeeded in creating not only movement, but also the morphing of limbs and facial features – both of which performances have made the eighteenth-century works of Jacques de Vaucanson and the Jacquet-Droz brothers pale into insignificance - and are strongly reminiscent of the golden maidens forged by the ancient Greek god Hephaestus (later identified with the Roman god Vulcan), whose creative abilities induced him, not to exceed nature by creating unprecedented forms, but to imitate its existing forms as closely as possible. Man, even with regard to his quest for a self-replica, gives evidence of having attained a certain evolutionary stability. He returns, from time to time, to the same old projects, applying, for their realization, procedures that are ever more sophisticated yet typical and recurrent; he takes into account his failures, yet is ready to run headlong into them again. He does not content himself with the robot-slave, with the machine-as-tool; but rather, infringing cultural limits and taboos, he once again sets out to realize his dream, which envisages, in the role of protagonist, a robot endowed with cognitive autonomy, and capable of feeling emotions.

Robotics Between Misconception and Market Requirements

One could argue that the roboticists' insistence upon attempting to give their creations the likeness of human beings is perhaps intended as a sort of amusing pursuit dating from man's ancestral origins, in which illusion and power are intermingled. It is also rea-

sonable, however, to ask oneself what effects the interaction with anthropomorphic robots might have upon the average person, generally lacking coherent systems of representation regarding the principles of science and technology. Contemporary Western culture is guided largely by positivistic and pragmatic premises as opposed to theological and metaphysical issues. Nevertheless, it still shows great difficulty in assimilating rational and methodological criteria as a means of attaining well-balanced forms of public acceptance of scientific knowledge and technological products. The ease with which designers take for granted that an anthropomorphic robot should be more readily accepted is testimony to the widespread diffusion of the idea that mankind always needs to, and is always able to, reduce to the known, the familiar, the natural, even the most counter-intuitive scientific knowledge and the most complex technological innovations. In reality, we are dealing with processes that are often resolved with the reinstatement of myths intended as solutions to mysteries – such as entities with which, ultimately, we can interact by natural means, without running the risk of plunging into the abyss of ignorance or of the 'radical other'. In other words, the technological double, thanks to its 'natural' form, represents a sort of unconditional surrender, on the part of technology, to a man who defines himself as a user, and who, continuing to take for granted the world and its objects, appears to have no intention of calling into question his own body of knowledge. If his acquired objects continue to work as expected, and their use continues to produce the results he expects, he has no need to ask further questions.

The natural look of robots – so it is thought – should further facilitate their acceptance. This explains, at least in part, the propensity of certain technologists to predict that robots, within twenty years, will inevitably be beautiful, gracious and polite. For example, according to Hirochika Inoue, who has been working on anthropomorphic robots for the past four decades, we shall, in the not-too-distant future, be aided by robots in all sorts of activities, and their size and appearance will certainly be a winning bet. This is the basis of his conviction that the reproduction of every human physical characteristic should be strictly functional for reaching the desired objective. The face should have eyes to see and ears to hear. There should be arms and hands to grasp and manipulate objects, and two legs (more versatile than wheels) to allow the robot to move around easily and avoid obstacles. The anthropomorphism of robots ultimately demonstrates that the designers themselves are perhaps channeling their efforts on the basis of an assumption that is overly simplistic, convinced that the physical feasibility of the technological device requires avoiding, at all costs, that which is in fact inevitable: the acceptance of its belonging to a constitutionally different 'species'. The effort to assign human features to the machine, resorting to all sorts of materials, is therefore nothing other than the umpteenth miserable attempt to create an interlocutor that is not too distant, in terms of complexity, functionality and demands, from our own species.

Body and Soul

Undoubtedly, robots that behave intelligently, reproducing human sensorimotor abilities in response to a variable environment, and demonstrating the capacity to represent the world, just as we do, thanks to the processing of information filtered by heteroceptive sensory organs (of sight, hearing, touch and smell) and proprioceptive sensory organs (of position, movement and balance), are already a great achievement in their own right. Nevertheless, the desire for replication pushes us even further, inducing us, for example, to cover the mechanism with a warm, pink epidermis. All of this triggers reflection that abruptly carry us back to the thirteenth century – that is, back to the time of the waxen statues. However, in the case of modern-day robots, artificial skin is not only an added dimension, a simple integument, a sort of whole-body glove; it helps us to understand the most recent trends in anthropomorphism. Edmund Husserl – to whom we are indebted for some of his fundamental intuitions regarding matters of the body – distinguishes between *Körper*, the physical body, the somatic body for which we can provide an anatomical and physiological description, and *Leib*, the living body, the body in its entirety and not in its individual parts. Unlike the body intended as object or thing, the *Leib* is characterized by intentionality, thanks to which human beings establish a relationship with the world. While the *Körper* is bounded by the outermost layer of skin – a limit that encloses it as if in a sack – the *Leib* transcends this limit and opens itself to a world of meanings: a world endowed with sense [2]. While, on the one hand, the Cartesian distinction between body and soul – considering them as two metaphysically distinct realities – no longer holds sway as it once did, on the other hand, a conception of ‘living body’ incarnating the consciousness seems to be gaining ground. This conception would locate the robot, in the event of it exhibiting abilities to process sense and intentionality, in a dimension that is no longer only physical. The decision to cover the body of the robot with latex should not, however, be understood exclusively as a stratagem aimed, above all, at concealing its artificial otherness. Rather, such a choice indicates just how much the ‘being there’ of the robot is an event that engages it entirely, opening it ‘bodily’ to the world. Therefore, just as for the human being, whose skin constitutes the basis for his every psychological development – from the moment when separation from the mother is experienced by the newborn baby as a brusque laceration of a common skin – for the robot, too, the skin would function as a narcissistic shell, allowing it to represent itself as an ‘I’, able to assure its own equilibrium by relying on its own mental contents. It is obvious that if this were the case, we would be facing a sort of ‘hyper physics’ of mimesis, because the robot would be a non-metaphysical double: a double that is not satisfied with a mere form and appearance, but which goes well beyond – in short, a body that presents itself to the world as a subject, an individual.

Why the need for a Roboesthetics?

The invisible sensors that simulate the natural sense of touch underline, in reality, the complexity of the human machine with respect to an artificial one. Notwithstanding the marvelous intricacy of each of the two systems – both natural and artificial – unbridgeable differences persist that should lead us to assume a critical position about the often-facile analogies between man and robot. In other words, the technology of ‘naturoids’ moves and operates within a natural environment, reproducing its processes (Negrotti 2012:3). For this reason, it is complementary to nature but does not substitute it in full: and at times it can enrich or complement nature only by attributing, to natural objects, properties and capacities that they do not in fact possess. Therefore, assuming that the ambition of modern-day engineers to construct a robot similar to a human being will one day be realized, it should be remembered that the original, the exemplar, will remain unchanged, and that even if the copy seems perfect, the man-mimicking robot will not be able to present all of man’s characteristics. In short, disappointment is just around the corner, and the destiny of Pygmalion is ready to repeat itself. An incredible paradox lies at the heart of all this. A statue that is no longer a statue, that is no longer cold and immobile is destined, like all human beings, to age, thus losing the only unique privilege it might have had. That of Pygmalion is one only among the many instances. All history of the art, starting from the fascinating Greek fables, develops around the replication myth and the ambiguity always present between the represented object and its natural exemplar. Therefore, we can maintain that the art is the only knowledge strategy able to provide to robotics an alternative to its replication ambition. This is due to two fundamental reasons. The first is the fact that the art has been the absolute domain of reflection on the imitation of nature. The second one is that it ended giving it up.

In other terms, the art shows the existence of limits for the replication that cannot be exceeded. The artist, by now, has freed himself from the obligation to confront to the object he wants to reproduce. The model he refers to is, so to say, exhaustive because the artist must not deceive anyone, he must not explain anything but his own poetics. This is a matter of a historical outcome that should not be neglected by the roboticists. Actually, they seem to perceive the discrepancies between the properties of the natural object and the ones of the robot, as a sign of a discouraging failure of a project. The following graphics clearly synthesizes this point. The continuum of positions on the time axis spans from the most rigorous representational conception to one more open to assign to the art an innovative, constructive and fantastic role, that is to say, characterized by the ability of the artist to go beyond the original object or even regardless of it. It is interesting to remark that the same axis can indicate the various options available to robotics.

In fact, since the replication ambition of the anthropomorphic robotics is perfectly analogous to the representational efforts of the art, it makes sense to ask if robotics could get a useful lesson from the development of the art and its abandonment of the replication utopia. In fact, giving up the replica obsession “the design space opens without limits” [3]. In short, then, in the light of the intuitively insurmountable limits of artificial production, we may ask: is a ‘figurative’ robotics really worth pursuing, or might an ‘abstract’ robotics – or at least one freed from the obsession for replication that has so long afflicted the world of art – be just as seductive? We can deduce that the answers to these questions are not to be found in the suggestions advanced by this or that expert on aesthetics nor, least of all, in the ideas of the latest up-and-coming guru from the fashion world, nor in the often rather gloomy fantasies of the mass-media nor, for the moment, in the sinuous humanizing forms promoted by the *Ars Robotica*. On the contrary, robotics and art in association could potentially open up a new scenario which, considering the radical novelty of the new ‘species’, could attain a level of observation based on a common project. If, on the one hand, the unification of several levels of observation of reality – in this case, that of robotics and art – entails a depletion of the original levels, on the other hand, it has the power to produce an enhancement of the new level because, during the process of synthesis, the levels are invariably transformed into a totally new perceptive and attributive configuration. It is obvious, indeed, that a robot with extrinsic ornamentations exhibits a makeshift embellishment, based on a propensity for Utopian or merely didactic imitation, without any attempt to grasp and interpret the new reality that the robot heralds – a reality that is, in other ways, insistently but generically propagandized as revolutionary and unprecedented. Endowing robots with human features certainly does not appear to depend ultimately on a concept that considers non-human constraints, but above all the added extras of the technology available, as novel elements worthy of exploration and development. For example, what does the fact that a robotic wrist that might easily be permitted to turn through 360 degrees, as opposed to our mere 180 degrees, entail with regard to the aesthetic correspondence between natural movement and artificial movement? It is obvious that an accentuated anthropomorphism cannot but lead to a shrivelled, non-flourishing branch of robotics: a new, more spectacular phase, but one which is essentially identical to the automata tradition of past centuries. With regard to both the potential performance and the aesthetic appearance of a robot, the determination to make it a surrogate of man would actually end up limiting its potentialities. A robot with an extendable neck, for example, would prove rather more strategic, in many practical circumstances, than would a mere simulacrum of the human body, complete with its inherent limits of movement. From an aesthetic point of view, on the other hand, it cannot but be conceived of in wholly different terms from those of the ordinary man, thus creating, in this case, amongst other things, an interesting parallel with the poetic art of Amedeo Modigliani or

of Picasso in, for example, the portrait of Marie Thérèse, in which he cuts the face in two, bringing out the nose and one of the eyes, thus forming a face that seems to appear simultaneously face-on and in profile.

Why should the hands necessarily respect the human form? The depiction of the fingers of Christ in Lorenzo Lotto’s fresco *The Legend of Saint Barbara* opens fascinating prospects of an uncommon prehensility, revealing the artist’s extraordinary creative and expressive power. Suggestive vistas could open up for art and anthropomorphic robotics together, based upon their common dependence on the desire to imitate. Just as in figurative art, in which the comparison between art and nature has long conditioned the expressivity, so, in anthropomorphic robotics, the attempt to surpass the confines between artifact and nature is proving, from both conceptual and factual points of view, to be a highly conditioning limit. Designers of anthropomorphic robotics must bear in mind, first of all, that the truly decisive changes in art have always occurred in relation to corresponding changes in conceptions regarding the relationship between art and nature: the less interest there is in replicating the natural exemplar, the greater is the degree of transfiguration. Therefore, if it is true, as we believe, that the faithfulness to nature in art has impeded, for a certain period of time, new trans figurative and creative possibilities, then the beautiful and elegant robots, pursuing the illusory presumption of making robots into true doubles of man could, in the end, reawaken the same type of disappointment that drove artists to abandon every obstinate project of replication [4]. Finally, how could we not fear repeating the error that Jacob Burchardt made in dismissing the proportions of the figure of the Parmigianino’s long-necked Madonna as an unbearable affectation? The idea that art should be respectful of nature’s forms prevented Burchardt from grasping the novel character presented by the work, and from appreciating, as a consequence, the creative power of its author, who knew how to renounce the idea of faithfulness to the natural figure in the name of a transfiguration of high poetic content. There seem to be good arguments, therefore, to justify the proposal for the introduction of Roboaesthetics: on the one hand, the recovery of the reflections and reassessments that have occurred, if only occasionally, in the history of art; and on the other, the study of the genuine ‘nature’ and genuine evolutive aptitudes that robots may realistically achieve.

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