New Challenges and Opportunities for Catholic Theological Reflection

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The Role of Hermeneutical Theology in Robotics

Discussions on robotics in the social media and literature often take an utilitarian and instrumental approach. Intelligent and learning machines are perceived as a means of making our lives easier and more comfortable, minimising the costs of production and labour, improving healthcare system, transportation and military defence, and substituting humans in child and elderly care. Moreover, robotics designers, engineers and programmers tend to focus on technical challenges and advances without any reflection on the pressing philosophical, ethical and religious questions. The moral quandaries raised by robotics are too important and complex to be left to technical experts!

In a democratic society all stakeholders, including faith communities, have the right to enter into an open and transparent debate on these emerging technological breakthroughs that are blurring the lines between the human and machine. Humanity fails to ask pertinent philosophical, ethical and religious questions if Christians and concerned citizens remain bystanders as cognitive machines develop and become commonplace. Public debate on robotics must cross multiple scholarly and professional disciplines, including theology.

The initial reaction of many theologians and religious people to the very idea that faith has nothing to contribute in the debate on robotics is no longer tenable. Theologians are able to broaden people's horizon on robotics by asking the right questions that place life, science and technology in a different light.

The classical definition of theology as 'faith seeking understanding' means that faith in God as revealed in Jesus Christ prompts a questioning search for a deeper understanding of human experience. Faith is not an independent reality alongside the rationality engaged in human experience; nor does faith diminish our interest in the rational systems operating in the dynamics of converging technology to improve the quality of life. Human experience could be a genuine source for theologising, an equal partner in the dialogue with revealed truth.

In what way are intelligent and thinking machines related to the theological narrative? Faith provides a new horizon of meaning which is something like a hermeneutical key for the understanding of today's scientific-technocratic culture. From a theological perspective, technology can actually improve human life only when accompanied with "a sound ethics, a culture, and spirituality genuinely capable of setting limits and reaching clear-minded self-restraint" (LS 105). Human responsibility, values and moral conscience are needed to guide technological power since it is an illusion to claim its moral neutrality (LS 114).

Faith exercise a threefold role in relations to the technological rationality manifested in robotics: integration, stimulation and criticism. Hermeneutical theology broadens the horizon of meaning to move beyond the instrumental and reductionist models of robotics to an ethics of responsibility that stimulates a critical discernment of the legitimate motives, sound values and norms that should guide robotics and its use.

Theological anthropology is the hermeneutical key to restore the centrality of the dignity of the human person in today's robotic culture. Pope Francis' remark in his message for the World Economic Forum, convened in January 2018 at Davos, is very meaningful in this regard: "Artificial intelligence, robots and other technological innovations must be employed that they contribute to the service of humanity and to the protection of our common home, rather than to the contrary, as some assessments unfortunately foresee".[1]

Pope Francis reiterated this theological insight in his letter to the Pontifical Academy for Life to mark its 25th anniversary. Pope Francis wrote, "There is a pressing need, then, to understand these epochal changes and new frontiers in order to determine how to place them at the service of the human person, while respecting and promoting the intrinsic dignity of all. This task is extremely demanding, given its complexity and the unpredictability of future developments; consequently, it requires even greater discernment than usual. We can define this discernment as "a sincere work of conscience, in its effort to know the possible good on the basis of which to engage responsibly in the correct exercise of practical reason".[2]

Faith asks hard questions about the value and nature of robots, their influence on human flourishing, their societal benefits and risks, their impact on the labour market, healthcare, industry, economy, transportation, education and military defence. Robotics needs to be human-centred.

The Integrating Role of Theology in Robotics

Pope Francis makes a strong appeal in *Laudato si* (LS) to cultivate a "broader vision of reality" (LS 159) through the concept of "integral ecology" that insists on the conviction that "everything is closely interrelated" and that "today's problems call for a vision capable of taking into account every aspect of the global crisis." (LS 137) He calls to notice and study interconnections in order to avoid "the fragmentation of knowledge and the isolation of bits of information [that] can actually become a form of ignorance, unless they are integrated into a broader vision of reality." (LS 138) The approach of "integral ecology" to the "globalization of the technocratic paradigm" (LS 106) with "its effect on reality as a whole, human and social" (LS 107) is an important hermeneutical key to the critical understanding and evaluation of the epistemological paradigm of science and technology.

The theological concept of human dignity is central to the "integral ecology" approach. It is an overarching notion and an integrative moral principle that bridges religious and philosophical insights. Human beings, not intelligent machine or robots, have inherent dignity because only humans are created in the image and likeness of God. Therefore, robots and humans are not to be confused even if an android robot has the seductive appearance of a human, or if a powerful cognitive robot has learning capacity that exceeds individual human cognition. Moreover, human beings have intrinsic worth because they are centres of rationality, autonomous and free, and subjects of human rights. However, the dignity of every human person needs to be the central moral consideration in the design, production and regulation of robotics.

[1] Pope Francis, "Message of Hs Holiness Pope Francis to the Executive Chairman of the "Economic World Forum" on the occasion of the Annual Gathering in the Davos-Klosters", 12 January 2018.

[2] Pope Francis, *Humana Communitas*, (Letter to mark the 25 Anniversary of the Pontifical Academy for Life), 2019, p.6.

Robotics and AI can enrich human dignity by amplify human potentials and enhancing human flourishing. However, they can also be manipulative and abusive. For instance, robots enhance human dignity to workers when assisting them to reduce or eliminate dangerous and tedious tasks and when contributing to make their work more efficient, more varied, less strenuous, and more human. Moreover, robots have removed barriers in many cases for people with disabilities. Robotics can provide an opportunity to combine work and family care. On the other hand, the increasing use of robotics also poses threats to human dignity. Increased efficiency in the workplace brought by robotisation, automation, and digitalisation is widely believed to replace a considerable number of tasks, and sometimes people, by machines. It is at the same time worrying that these people will not easily find other employment in a highly complex robotised and digital society. Of course, replacement in the case of extremely dirty, dangerous, humiliating, tedious tasks may serve to protect human dignity. Yet substitution of workers by intelligent machine is against human dignity. Pope Francis reminds us that decent and sustainable work anoints us with dignity and "[i]t [therefore] must be clear that the real goal to be achieved is not 'income for all' but 'work for all'! Because without work, without work for all there is no dignity for all."[3]

Pope Francis in *Laudato si* warned us that robotics should never have a negative impact of "a dignified life through work". (LS 128) Work is a necessity, part of the meaning of life on this earth, a path to growth, human development and personal fulfilment." (LS 128) Since "we are created with a vocation to work", as Pope Francis recalled in *LS* 128, every individual has the right to participate in creation, to fully integrate into society, and to foster our personal individual development.[4] An economy that favours "technological progress in which the costs of production are reduced by laying off workers and replacing them with machines …. ends up working against ourselves." (LS 128) The theology of work supports programmes for the skilling, up-skilling and re-skilling of workers who are in a vulnerable and precarious situation.

Robots protect human dignity when they monitor public spaces to ensure people's security and safety or when used by the military for defence purpose. The algorithmic monitoring of specific workplaces can increase the safety of the workers. It also can increase productivity and discipline of workers. However, pervasive and excessive surveillance by robots is a threat to human dignity since they raise privacy concerns and autonomy issues and consequently increase vulnerability. Human dignity does not exist without respect for autonomy, independence, freedom and privacy that are essential for human flourishing.[5]

The use of robotics in elderly care is ambivalent. Robot caregivers enhances the human dignity of the elderly by saving them from lives of loneliness. 'Care-bots' can substitute caregivers in routine and strenuous tasks and can provide mechanical help for human care for the elderly or disabled people. The human aspects of caring for patients however cannot be replaced. Robots can be programmed for interaction but cannot share feelings or transmit emotions, or have sympathy. We cannot speak about 'artificial care' or 'artificial empathy'. The intrinsic meaning of care is the practical expression of human virtues in empathetic and interpersonal relationships above all towards particularly vulnerable individuals that require responsibility and need for solicitude and attention.

[3] Cf. Pope Francis (2017), Address at the Meeting with Representatives of the World of Work - Pastoral visit to Genoa: https://bit.ly/2x4rNWE ; Laudato si', Encyclical Letter on the Care for our Common Home, para. 124: https://bit.ly/1Gi1BTu ; cf. also ibid, para. 128: https://bit.ly/1Gi1BTu

[4] COMECE, *Shaping the Future of Work*, COMECE, Brussels, 208, pp. 9-10.

[5] EGE, *The future of Work, The Future of Our Society*, European Commission, Brussels, 2018, p. 70

Robotic cars, also called self-driving cars or autonomous cars, can protect human dignity by improving the quality of life through safer and more efficient public transport, decrease the number of accidents, lessen traffic jams, stress free parking, better coordination of traffic in urban areas, ease congestion and give greater accessibility to senior citizens and people with disabilities. However, they can also threaten human dignity, harm or kill persons and endanger people's life due to safety and security concerns, technological failure, proneness to hacking, sensor failures, potential loss of privacy and impact on employment opportunities.

From a theological perspective, "science and technology are wonderful products of a God-given human creativity" (LS 102) which empower humanity's vocation to participate in God's creative action (LS 131). In biblical theology robotics and technology in general are perceived as a God-given means of "filling and subduing" the earth, bringing out the extraordinary capacities which the Creator has given to us to explore in our role as co-creators. The biblical narrative also reminds us of the pervasive nature of human fragility and sinfulness and consequently the need for wisdom, prudence and discernment in face of technological progress.[6] The theology of creation, sin and redemption integrates robotics into God's plan of creation, the reality of human sin, weakness and vulnerably, and God's plan to redeem humanity and creation through technological ingenuity which is the human response to God's grace.

The Stimulating Role of Theology in Robotics

A major concern about robotics is the claim that cognitive machines can now be attributed agency similar to humans due to their level of intelligence. Many believe that today's sophisticated learning machines have a 'self' with intentions and goals, emotions and some degree of awareness or consciousness. Moreover, they believe that cognitive machines are autonomous, capable of decision-making and interacting with others, recognise people, talk, and resolve problems even faster than humans.

Theological anthropology and ethics throw light on the true nature of the human person and moral agency. Theological discourse stimulates the debate on robotic agency by raising pertinent questions on the true meaning of intentionality, freedom of the will, the role of emotions or desires, moral conscience and accountability.

The epistemological question concerning the attribution of moral knowledge to robots and its application to a range of different and possibly very complex moral dilemmas needs to be sorted out. The emerging discipline 'machine ethics' which aims to equip robots with ethical principles or procedures of resolving ethical dilemmas indicates the extent of today's technological reductionism[7] which is harshly criticised by Pope Benedict XVI in *Caritas in veritate.* (CV 70) Christian ethics reveals what Gilbert Ryle called a 'category mistake' - caused by asking the wrong questions – by equating human agency with robotic agency[8]. Moreover, Ludwig Wittgenstein challenged philosophers as well as theologians to pay attention to the use of ordinary language as a way of solving philosophical problems.[9] Theology can serve as a grammar to structure thoughts and expressions about cognitive

[6] COMECE, *Robotisation of Life. Ethics in view of new challenges*, COMECE, Brussels, 2018.
[7] Michael Anderson & Susan Leigh Anderson (eds.), *Machine Ethics*, Cambridge University Press, 2018 and Wallach Wendell & Allen Colin, *Moral Machines. Teaching Robots Right from Wrong*, Oxford University Press, 2010.
[8] Gilbert Ryle, *The Concept of Mind* (New York, NY: Routledge, 2009), 5–8.
[9] Ludwig Wittgenstein, *Philosophical Investigations* (Oxford: Blackwell, 1958).

machines in order to correct the blatant confusion of 'language games' in the ordinary day speech on robotic agency.

Moreover, Christian anthropology stimulates pertinent ontological questions on robotics. What does it mean to be human? Can we assign personhood to robots? Can we talk about the dignity of robots? Do they have rights? Are robots self-conscious? Do they have feelings and emotions? Do they have a moral conscience? Do robots have intrinsic value or instrumental value? Can robots sin? Do robots have a soul? Does God want the salvation of robots?

In Christian ethics, similar to moral philosophy, it is through free actions and deliberate decisions taken in conscience that humans become moral agents. The moral goodness of an human act is assessed in accordance with three conditions: the object, the intention, and the circumstances. The distinction between members and non-members of a moral community depends on the capacity to exhibit intentionality, the will and rational deliberative choice to move autonomously towards an object and a rational awareness of circumstances. The absence of these criteria means the exclusion from the moral community due to the nonexistence of moral agency.

Moral agency is the characteristic of humans, not of machines. The agency of robots has its origins in the work of designers and programmers, and in the learning processes that cognitive robotic systems have gone through. Moreover, the goals of robotic activities are structured in their in-built artificial intelligence and algorithms. For this reason, one cannot ascribe intrinsic intentionality to a robot. No matter how intelligently robots may act, they lack intentionality. For this reason, robotic agency as such has no moral worth. It is the agency of their designers and programmers that falls within the moral domain. A morally good act requires the goodness of the object, of the end, and of the circumstances together. Without the capacity of intentionality, the issue of the object of the action and the circumstances of the moral act in the case of robots becomes irreverent and superfluous.

The emerging discipline of 'machine ethics,' which is concerned with giving machines ethical principles or a procedure for discovering a way to resolve the ethical dilemmas they might encounter, raises important questions. Is it possible to construct some kind of 'artificial moral agents'? In other words, could we programme morality in a robot? Can we teach robots right from wrong? Moreover, can robots when handling a situation, which does not match the rules, be equipped with a decision-making processes? Can they learn from experience and make moral decisions about how they should act? Can robots calibrate their algorithms themselves that their behaviour become perfectly unpredictable?[10] Most scholars working on machine ethics agree that robots are still far from becoming 'ethical agents' comparable to human beings.

Virtue ethics, which is central in moral theology, is another issue in robotic agency. Is it possible to programme robots to acquire moral virtues? Good dispositions or habits are those qualities that a moral agent acquires naturally by the frequent repetition of free acts. How can robots become virtuous if they do not possess emotions or feelings in the proper sense as humans? To be virtuous is not a matter of being designed and programmed in such a way to possess certain dispositions but rather the result of rationality and free will. Robots can never

[10] COMEST, *Report of COMEST on Robotic Ethics*, UNESCO, 207, p. 4.

acquire the virtues of justice, prudence, temperance and fortitude, which are central in Christian ethics.

Given the increasing autonomy of robots, the question arises who exactly should bear ethical and legal responsibility for robotic behaviour. Could we talk about shared responsibility between robots, designers, engineers and programmers? None of these agents could be indicated as the ultimate source of action. This problem dilute the notion of responsibility altogether.[11] Moreover, the issue of traceability is crucial in the discussion on responsibility of robots. Is it possible to track the causes of all past actions (and omissions) of a robot?

Another problem in robotics is the issue of rights that are central in Christian social teachings. What is the moral status of robots? Are they subjects of rights? Would robots deserve the same moral respect and immunity from harm, as is currently the case with humans and some non-human animals? The Draft Report with recommendations on Civil Law Rules on Robotics presented in 2017 to the Commission by the Committee on Legal Affairs of the European Parliament was widely criticised as inappropriate, particularly for its recommendation to consider robots as electronic persons.

The Critical Role of Theology in Robotics

A great concern for theological ethics is today's overconfident, optimistic and utopian vision of robotics. The British theoretical physicist Stephen Hawking voiced many times his concern on this matter. Pope Benedict XVI in *Caritas in Veritate* took also a critical stand towards technological *hubris* by warning that human advancement, progress and development "goes awry if humanity thinks it can re-create itself through the 'wonders' of technology." (CV 68) True freedom becomes a reality by accepting human limitations. The theology of creation, sin and redemption throws light on the human condition with all its potentialities and limitations as a God-given gift to be cherished, respected and improved. This requires a sense of humility to accept human vulnerability without however becoming disinterested to continue to improve the human condition.

Robotic technology is raising intriguing question on justice, solidarity and the common good, which are central principles in Catholic social teaching. What are the potential social injustices and inequalities related to an economic model that assumes robots to be a different sort of capital, one that is a close substitute for human workers? Will robotics enhance modern day poverty and create new categories of vulnerable groups? Are robots increasing social inequality by robotics, automation, algorithms and AI that account for job polarisation? Will they bring a new divide between developing and developed countries regarding access to robotics technology? Will the digital divide encompass the robotic divide? These are few questions raised by Christian social teaching on the moral quandary on robotics.

Issue of justice arise in the labour sector since the lower skilled workers are becoming disadvantaged. Rapid advancement of robotics requires higher-skilled workers. Christian social ethics promotes the right to a decent work and the right to social security. Christian ethics promotes an economy that is at the service of the integral human development.[12] Therefore, society needs to introduce additional protections for vulnerable groups to strike the right balance between security, flexibility and innovation. We need upskilling of workers

[11] COMEST, *Report of COMEST on Robotic Ethics*, p. 6.
[12] COMECE, *Shaping the Future of Work*, p. 17

as well as societal upskilling. New institutional arrangements and instruments are required because we cannot assume any longer the traditional concept of paid work to be the main basis for the traditional concepts of social and economic security.

Healthcare robots can provide physical assistance and companionship. A robot that can stimulate cognition of a dementia patient or execute on a day-to-day basis some tasks may be beneficial. However, we cannot ignore the possible pitfalls. How can we balance security and behavioural control with the autonomy of ageing persons? What about a loss of private life and intrusiveness? Can such robots help older people live independently in their homes and extend the time of 'ageing in place' instead of moving to institutional care? Is the purpose to reduce the work of caregivers? Is the purpose to discharge society from the care of old people? [13] Are robotic systems able to provide adequate care? Are robots able to treat elderly people with due respect?[14]

Christian ethics raises questions concerning the increase of military use of robotics. The fact that weapons have become more precise that enable to destroy precisely whoever is targeted does not mean that one is more capable of making out who is and who is not a legitimate target. Moreover, assessing the principle of proportionality remotely is seriously problematic. Does the remote pilot have enough contextual evidence to balance expected military advantage against the loss of civilian lives? Regarding autonomous weapons, is it ethically acceptable that machines take life and death decisions? Is it ethically correct to delegate a machine, no matter how complex its programming, to kill other human beings?

Concluding Reflections

Pope Francis in his message to the executive chairperson of the World Economic Forum on the annual gathering at Davos in 2018 remarked: "There is a grave responsibility to exercise wise discernment, for the decisions made will be decisive for shaping the world of tomorrow and that of future generations. Thus, if we want a more secure future, one that encourages the prosperity of all, then it is necessary to keep the compass continually oriented towards "true North", represented by authentic values. Now is the time to take courageous and bold steps for our beloved planet. This is the right moment to put into action our responsibility to contribute to the development of humanity."

At first glance, theology and robotics do not seem to have much in common. In a kind of "two kingdoms," robotics and AI seem to deal with the physical world, while theology deals with the spiritual. Yet, Pope Francis' message to the World Economic Forum indicates the relevance of the theological narrative to technology that is shaping the life of current and future generations. Theology needs to get more and more interested in robotics in order to offer moral guidance and leadership. Technology in general, and robotic and AI in particular, matter to theology because they are altering culture and creating a new grammar about technological activity. Theological engagement in robotics and AI is needed to grapple with the epistemological and ontological issues raised by the robotic culture and AI. Christian ethics, which is theological discourse, contributes to differentiate the human from the machine, to throw light on the nature of human and robotic agency and to assess the benefit from the harm of robotics. Once placed in a theological narrative the ethical, moral and religious claims made by robotics and AI become more significant and intriguing.

[13] COMEST, *Report of COMEST on Robotic Ethics*, p. 31-2.
[14] COMEST, *Report of COMEST on Robotic Ethics*, p. 32.

Let us hope that there will be some gratitude from posterity for the present one for its moral wisdom, prudence and foresight to improve the human condition with robotics without however compromising the dignity, interests and rights of current and future generations!