

Law and Technology

The Challenge of Regulating Technological Development

edited by
Erica Palmerini and Elettra Stradella

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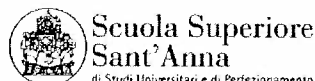
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Giorgio De Chirico, *Interno metafisico con mano di David*, oil on canvas (1968)

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The interplay between law and technology, or the RoboLaw project in context

Erica Palmerini

1. The RoboLaw project, an ongoing research

The RoboLaw project – whose full title is *Regulating Emerging Robotic Technologies in Europe: Robotics Facing Law and Ethics* – intends to investigate the ways in which emerging technologies in the field of bio-robotics have a bearing on the national and European legal systems, challenging traditional legal categories and qualifications, posing risks to fundamental rights and freedoms that have to be considered, and more generally demanding a regulatory ground on which they can be developed and eventually launched.¹

Building on the perception of a pressing need for a legal framework to accompany the development of robotic technologies, the aim of the research is to outline a comprehensive analysis of the current state-of-the-art of regulation pertaining to robotics in different legal systems, in order to understand whether new regulation is needed or whether the problems posed by robotic technologies can be handled within the framework of existing laws.

Robotics is a wide and multi-faceted domain, which crosses boundaries between disciplines and encompasses biotechnology, nanotechnology, and neuro-technology. The ambition to achieve a thorough overview of the legal implications of robotics therefore

¹ The project is funded within the 7th FP (Grant Agreement n. 289092), began in March 2012 and will last for 24 months. The research is carried out by a consortium of four partners from various institutions and with different backgrounds and expertise: the Dirpolis Institute and the Biorobotics Institute of the Scuola Superiore Sant'Anna in Pisa, the Tilburg Institute for Law, Technology and Society (TILT) of Tilburg University, the School of Systems Engineering of the University of Reading, and the Department of Philosophy of Humboldt University of Berlin.

The challenge of regulating emerging technologies.

A philosophical framework

Alberto Pirni and Antonio Carnevale¹

1. Towards a new epistemological recognition between human beings and society

The attempt at drawing the line between the modern technologies and the so called ‘new’ technologies is easily condemned to an outcome of dissatisfaction, as it is so complex to reduce such a huge variety of realisations to a unitary and homogeneous set of characteristics. Far from engaging in this almost impossible attempt, the present contribution starts from the sharing of a conceptual stipulation that seeks to exploit what is surely one of the defining characteristics of such a line.

More specifically, we would like to suggest that one of the relevant ways of distinguishing ‘new technologies’ from the previous ones could be presented as follows: the ‘new technologies’ are not only (and perhaps no more specifically) concerned with *how man relates to the world*, but also – and here specifically – *how man relates to himself*.

Traditionally, technological innovation was involved in the answer to a recurrent question about ‘man’s role on earth’. Retrospectively seen, the (multiple) answers to such a question could be summed up as an infinite variation on the topic of (the attempt of) domination by man over the earth. Examples of this fundamental attitude can easily be found in the history of science or technology, from the invention of the wheel to the telescope, from the microscope to the personal computer.

¹ Alberto Pirni is the author of sections 1, 4 and 5, Antonio Carnevale of sections 2 and 3, while both together thought through the entire path of the essay.

Now, the unprecedented perspectives opened up by new technologies shift relevant attention towards an (until now) unsuspected frontier: the single human subject, understood as a whole of enormous complexity, but nevertheless not impossible to conquer. In other words, the territory to be conquered is no longer *external*, but completely *internal* to the individual person, to each one of us. This could appear as a banal result and quite a limited field. On the contrary, its frontier promises the conquest of an immense and potentially inexhaustible territory, and inaugurates for man *a new* form of dominion over a *new* world.

First, on a preliminary and material level, the exploration of such a territory (the human body and brain) obviously presents a mass of problems, which thus technical developments are going to make more approachable.² On a second level, such developments involve a not less relevant mass of juridical problems, related to a series of questions about legal liability, protection of property (and of intellectual property) rights, and respect for fundamental rights, just to mention some of the most susceptible juridical areas.³

Nonetheless, taking into account that challenge along a gradually recursive path, the multiple and interdisciplinary attempts of conquest of such a territory raise the question of the adequacy of the conceptual languages that these attempts unavoidably imply. We should admit that, sometimes, this implication is the result of a way of approaching some fundamental questions related to individual persons and their intrinsically conceptual background, and that such an approach is not always aware of the consequences it can trigger. Other times, the same implication hides the conscious will of going beyond certain problems, of making clear the benefits of innovations, consciously trying to avoid facing the (juridical, political and primarily, philosophical) nodes and problems that would put the same benefits in a diametrically different light.

² For example, consider the innovative possibilities opened up by biomedical research (nanotechnologies, neural interfaces or micro-invasive surgery) or applications (biomechatronic prostheses and sensory devices), as well as by the evolution of radiology in diagnostic and therapeutic fields (fMRI, PET, and so on) up to the scanning (electron) microscope.

³ A wide overview of these areas of questioning is presented in the second part of the volume.

The present essay, far from the ambition of addressing this entire problematic area, pursues a more limited and exclusively methodological goal. Its purpose, in fact, consists firstly in making explicit the path just sketched, with particular reference to some theoretical turning points. Secondly, the essay proposes to give voice to a need both for clarification of the implications mentioned above, and for a renewed semantics of the conceptual language that lies at its basis.

This double purpose will be addressed by paying attention to two areas of structural and recursive elaboration of any possible language that is able to gain social relevance. The first area is that in which the so called ‘social norms’ – in the sense we are going to explain – take form, i.e. structure themselves through social interaction and shared practices (§ 2-3). In turn, the second area – the so called ‘public sphere’ – is committed to the shaping of public opinion, and in its structuring into languages and deliberations conceived for influencing the political level (§ 4), on one side, and for moving the political discussion towards reshaping and consolidation of conceptual vocabularies as well as juridical norms, on the other (§ 5).

2. Regulation and social norms: at the source of the rational justification

New technologies enter into the life of humans in a different way than in the past. Human development is so much conditioned by technological devices, applications, items, machines and software that our anthropological foundations risk being determined from the same technologies. We can here mention the example of bionics: introducing a machine into a human body can never be without consequences. It is not only very difficult from a technical and medical point of view, but it also has an effect on social and ethical aspects. The patient has to accept the implant in order to maintain his or her own identity: technical implants can affect one’s self-awareness not only as an individual, but as a human being too.

Therefore, robotics as well as nanotechnology, biotechnology, information technology, and cognitive sciences do not determine human life, intervening in human nature and altering its bodily functions or state beyond natural barriers. Rather, by giving persons

major emancipative opportunities, these technologies enhance human life. Due to the great benefits that technologies promise – such as greater productivity or more creative and intellectual breakthroughs, stronger bodies and minds – individuals desire to be individually and socially enhanced in the first place, and for that some are beginning to integrate technology within their bodies to have access to a kind of *hyperagency*: “a Promethean aspiration to remake nature, including human nature, to serve our purposes and satisfy our desires”.⁴

Therefore technology is not a mere knowledge that is used to produce objects and to regulate relationships between them. Nowadays technology is even more a knowledge by which we build the *internal* relationship between humans and the world. Consequently, not only does it have the function of adapting the world of things to human needs, but it also affects human needs by adapting them to representations of the world that humans produce, taking into account the desires, views, and beliefs of a society. The emerging technologies encourage the creation of a sort of ‘techno-imaginary’ that assimilates the meanings through which the individual and the collective organisations of society in general organise and symbolically express their relationship with the environment.⁵

This means that the human condition in contemporary societies increasingly needs the emerging technologies to protect individuals from two types of vulnerabilities. As human being, compared with other species in the animal kingdom, we are particularly incomplete at birth. We do not have a developed natural instinctual apparatus to guide our behaviour. So the human organism is *naturally* signed by a evolutionary underspecification with a constitutive weakness and vulnerability. Secondly, as citizens of democratic and advanced societies, we are vulnerable to the collective structure and to the immaterial relations that shape the society. To live in a society, we need interpersonal and social recognition; thus we are also *culturally* vulnerable.

This implication of ‘natural’ and ‘cultural’ vulnerabilities furnishes a theoretical starting point of our argumentation. Our thesis may be stated thus: since the emerging technologies are so ‘embodied’, not only

⁴ M. Sandel, *The Case against Perfection: Ethics in the Age of Genetic Engineering* (Cambridge, MA: Belknap Press of Harvard University Press, 2007).

⁵ C. Coenen *et al.*, *Human Enhancement* (Bruxelles: European Parliament, 2009).

in the cultural and symbolic structure of the society but also in the bodies of persons (it is sufficient to think to the implantation of a neuroprothese) – so much that we could be *natural-born cyborgs*⁶ –, we can consequently assume that a fundamental contribution to understanding the challenge of regulation comes from the study of *social norms* and their power to regulate behaviours using informal, often unspoken, rules, guides and common standards (even though, “social norms are easier to recognize than to define”⁷).

Social norms, like many other social phenomena, are the unplanned, unexpected result of individuals’ interactions. [...] Social norms ought to be understood as a kind of grammar of social interactions. Like a grammar, a system of norms specifies what is acceptable and what is not in a society or group. And analogously to a grammar, it is not the product of human design and planning.⁸

At the first level of this grammar of social interactions is the ‘emotional’ significance attached to the condition of being a member of a society or group. We can see the work of this significance in the special case of the *sanctions* which are at stake in social norms. Social norms (as non-legal obligations) are fulfilled because failure to do so brings upon the transgressor such social sanctions as induced feelings of shame, ostracism, and not infrequently, violence.⁹ Social norms have to do with the emotional constitution of the personal identity. Following a line of thought that passes through authors such as Sigmund Freud, Herbert Mead, Jacques Lacan and Jacques Derrida, we can argue that the ‘Look

⁶ A. Clark, *Natural-Born Cyborgs: Minds, Technologies, and the Future of Human Intelligence* (New York: Oxford University Press, 2003).

⁷ K. Basu, ‘Social Norms and the Law’, in P. Newman (ed.), *The New Palgrave Dictionary of Economics and Law* (London: Macmillan Press, 1998), 476-480.

⁸ C. Bicchieri and R. Muldoon, ‘Social Norms’, in E.N. Zalta (ed.), *The Stanford Encyclopedia of Philosophy* (Spring 2011 Edition), available at <<http://plato.stanford.edu/archives/spr2011/entries/social-norms/>>.

⁹ On shame and sanction, see: D.M. Kahan, ‘What Do Alternative Sanctions Mean?’, (1996) 63 *University of Chicago Law Review* 591 ff. On the moral implication of the shame, see: J. Deigh, *The Sources of Moral Agency* (Cambridge: Cambridge University Press, 1996); J.D. Velleman, ‘The Genesis of Shame’, (2001) 30 *Philosophy & Public Affairs* 27 ff. On the normative role of shame in the justice, see: M. Nussbaum, *Hiding from Humanity: Disgust, Shame, and the Law* (Princeton: Princeton University Press, 2004); R. Rodogno, ‘Shame, Guilt, and Punishment’, (2009) 28 *Law and Philosophy* 429 ff.

of the Other' situated on the other side of the generating dialectics of personal identity represents the normative glance of the community. This glance symbolises the sanctions for norm violation that entail an expression of disapproval or disgust or shame. This way of thinking is valid not only in terms of moral relations that can be psycho-analysed, but it is also the core issue in a normative theory.¹⁰

The 'normative' implication of emotions constitutes the second level of our consideration. Shame or guilt are feelings that may serve not necessarily as sanctionatory enforcement of internalised norms. In other cases, these *self-assessment* emotions can be part – morally structured and cognitively motivated – of a sense of responsibility which takes care of ourselves and the others, as testified by the interdependence between shame and intersubjective experiences like increased esteem, self-reliance and, most importantly, cooperation.¹¹ This is particularly evident for the case of shame. We are ashamed not just before the glance of society, because with our actions we have contravened its values; this is true for traditional and patriarchal communities. Rather, nowadays, we always feel more ashamed for the 'rational' justification that we furnish (or deny) to ourselves; we remain continually exposed to the gaze of *responsibility*, not the community. Shame was previously a reaction to a communitarian membership; today it assumes the emotional tones of a rational feeling that uncovers a sense of responsibility for the universal community of human beings.

Anyway, the emotional and normative implications involved in the case of shame are only an example. What is philosophically interesting in the perspective of this contribution is a consequent assumption coming from our mentioned example. Social norms challenge the conviction according to which norms are upheld only because of external sanctions. Often we continue conforming to a norm even in situations of complete anonymity because we have developed an internal normative system. Our philosophical interest in the social norms is demonstrated thus: since the regulation of the emerging technologies represents a challenge for the modern system of law, we

¹⁰ "I can know that I am rewarded or punished in such a manner by others – I can bask in their good opinion or smart under their bad opinion – without their actually doing anything," in: P. Pettit, *Rules, Reasons, and Norms* (New York: Oxford University Press, 2002), 281.

¹¹ See B. Williams, *Shame and Necessity. Sather Classical Lectures* (Berkeley: University of California Press, 1993).

think that this challenge cannot be faced solely by the reform and expansion of legislation by the modern state; rather we need to activate normative praxis that points to extending the participation of all actors engaged in the regulation process. To assist the delay of the law in its attempt to regulate the human development of new technologies, we should arrive at the sources of the rational (and human) claim to furnishing justifications, and we should think that from this source springs the same water that fuels both the effectiveness/validity of the legal norms, and the validity of the social norms. We need to go beyond the old approaches based only on the importance of command-and-control legislation and enforcement.

3. From social justification to political deliberation

The ‘linguistic turn’ that occurred in Western philosophy during the twentieth century implied an important transformation of the sense of reality, which passed from the realm of thought to the realm of language. Words are not labels attached to concepts; rather words are part of a language that constitutes the reality. The concept of a *chair* is not the representation of the real object *chair*; rather, it is the representation of the meaning of that object *named* ‘chair’. For this reason the meaning of the object needs a language in order to be expressed.

This shift does not only concern ‘natural facts’ (a tree that falls in a forest), but most ‘institutional facts’ also (legal contracts, political elections etc.).¹² This means that the model of objectivity is no longer represented by the *neutral observer* (first and second person), but by the *participant observer* (third person). However, the participant observer does not necessarily occupy a neutral and outside position; rather he (or she) constitutes a possible chance: his (or her) roles as a possible first or second or third person remains constitutive of the sort of facts he (or she) describes¹³, as well as of the relation to them.¹⁴ Rationality does

¹² On this see: J. Searle, *The Construction of Social Reality* (New York: The Free Press, 1995).

¹³ A. Wellmer, *On Spirit as a Part of Nature*, (2009) 16 *Constellations* 213 ff.

¹⁴ J. McDowell, *Mind and World* (Cambridge, MA: Harvard University Press, 1994); R. Brandom, ‘Knowledge and the Social Articulation of the Space of Reason’, in E. Sosa and K. Jaegwon (eds), *Epistemology: An Anthology* (Oxford: Blackwell, 2004), 424 ff.

not exist in abstract: to be true, each reason needs to be justified. ‘A reasonable justification’ means a pragmatic research of conditions, a continue evaluation of possibilities; what is deemed ‘reason’ is conditioned and not necessary.¹⁵

The law is not insensible to the influence of this shift. In fact, the *juridical* reasoning takes the shape of an everyday model of rationality that goes outside the traditional process of law-making, opening the production of legal norms to new moral obligations within the society. Declarations of principles, codes of practice, individual conduct, ethics committees, recommendations, guidelines, technical standards etc.: all these regulatory tools make law politically stronger because they constrain the legal sources of the norms to find beyond the *ratio juris* the semantic and symbolic resources suitable for their own justification. Law is no longer a series of acts that produce solely a legislation of the values and views enclosed in a ‘given’ society; much more than this, law contributes to the political *participation* in that society and, therefore, it can furnish the chance to challenge the social structure of that *given* society.¹⁶ So self-regulatory practices become politically relevant because they could be in the future the objects of an *alternative* regulatory dimension, designing the change from models of legislatively authorised *government* to models of administratively implemented *governance*. From this soft-law perspective, the political systems should imply mechanisms of normative co-regulation together with participatory governance to the legislation of the norms that are associated with the various spheres of social life. This is also true in our case – the regulation of the new technologies.

Due to the fact that the emerging technologies are so routinely introduced into people’s life styles, their abuse does not question the abstract universe of human values, but they enter into the variegated micro-systems of human practices, desires, claims. In so saying, we do not mean that they are less dangerous. On the contrary, the passage of *the question of technology* (Martin Heidegger) from the realm of metaphysics to politics renders the emerging technologies much more subtle and sneaky; hardly comprehensible. However, even though the penetration of the technology inside the social structure of reality and imagination can be a

¹⁵ O. O’Neill, *Construction of Reason. Exploration of Kant’s Practical Philosophy* (Cambridge: Cambridge University Press, 1989).

¹⁶ J. Habermas, *Truth and Justification* (Cambridge, MA: MIT Press, 2003).

motive of demonisation, on the other side, since the new technologies have expression and application on the political and social level, they retain the concrete possibility of being reformed, with integrations, modifications and amendments. Thus, contemporaneously with the increasing modalities of alienations and addictiveness, the emerging technologies (and the discussion on the implications of their regulation) offer political institutions the conditions of further participative and democratic collective actions – as is demonstrated by the reception of this aspect by the European Commission.¹⁷

4. Reframing the context: forms of public spheres

As mentioned above, besides the ‘social norms realm’ there is a no less important theoretical place in which we should appreciate the continuous elaboration of ‘languages with social relevance’. And this is a social relevance that is structurally about to turn into a political and legal one. This place is what historically has been called the ‘public sphere’.¹⁸

The concept of the public sphere is structurally a wide and vague one. The expression ‘public sphere’, at least in a first approximation, suggests the idea of a space that, on the one hand, might appear to be ideally falling within drawn limits – hence the image of a sphere, then the allusion to something circumscribed and individually defined. On the other hand, such a space maintains itself constantly open and it contemplates a common (and, indeed, public) access to what will be from time to time contained in it. In the words of Habermas, the public sphere could be described “as a network for communicating information and points of view (i.e., opinions expressing affirmative or negative attitudes)”.¹⁹ It is distinguished “through a *communication*

¹⁷ R. Von Schomberg, *From the Ethics of Technology towards an Ethics of Knowledge Policy and Knowledge Assessment* (Bruxelles: Publications Office of the European Union, 2007).

¹⁸ The first reference text on this topic remains the work by J. Habermas, *Strukturwandel der Öffentlichkeit. Untersuchungen zu einer Kategorie der bürgerlichen Gesellschaft* (Neuwied-Berlin: Luchterhand, 1962), English transl. by Th. Burger and F. Lawrence, *The Structural Transformation of the Public Sphere. An Inquiry into a Category of Bourgeois Society* (Cambridge, MA: MIT Press, 1991).

¹⁹ J. Habermas, *Faktizität und Geltung. Beiträge zur diskurstheorie des Rechts und des demokratischen Rechtsstaats* (Frankfurt am Main: Suhrkamp, 1992), English trans. by W.

structure that [...] refers neither to the *functions* nor to the *contents* of everyday communication, but to the *social space* generated in communicative action”.²⁰

For the purpose of the (only) methodological stipulation we are here articulating, let us define it in comprehensive terms as the cultural and political space which hosts and makes possible a debate about public issues and decisions. The public sphere is the place in which different ideals and issues, interests and values, policy-options and institutional proposals, confront each other and look for public recognition to enter in the political agenda and produce collective decisions and actions. In the public sphere (new) ideas first express themselves and then they can aspire to their own success, in terms of listening, public evidence, and numerical increase of their supporters.

The public sphere can be considered as an essential aspect in the long-term processes of institution-building and polity-building, which assume special relevance given the spread of democracy as the driving legitimacy idea of contemporary politics. In fact, looking back at European and American history, movements of social and political opinion belonging to the ‘public sphere’ contributed to at least three important processes. First, its development is linked and interacting with the development of the modern state institutional structure. Secondly, it has been the place of the struggle for the establishment of a corpus of individuals’ rights, and the very opening of the public sphere was one of the main demands in the first wave of emancipation struggles.²¹ Third, the progressive development and opening of the public sphere accompanied that of the state, and contributed to the progressive democratisation of its institutions.

Following this first and large approximation, we could sustain that public institutions, political parties, sector organisations such as trade unions or entrepreneurs’ organisations, intellectual elites, think tanks and NGOs, are all actors of the public sphere. Mass media, communication technologies, and other forms of political mobilisation and expression are also constitutive parts of the public sphere.

Rehg, *Between Facts and Norms. Contributions to a Discourse Theory of Law and Democracy* (Cambridge, MA: MIT Press, 1996), 360. The present and following quotations are taken from the English translation.

²⁰ *Ibidem*.

²¹ We will come back to this point in the following paragraph.

Within the contemporary philosophical debate, an acute interpreter of Habermas, Nancy Fraser, some years ago proposed a distinction between *strong* and *weak* public sphere.²² Going into this distinction just for what concerns our purpose here, we can specify that a *strong* public sphere certainly has a moral influence, but, firstly, it acquires its own ‘specific difference’ by the possession of an effective political-administrative power.

This is a context of discussion and political decision in the proper sense, whose action becomes effective through the implementation of legitimate and concretely operating juridical norms. In other words, the *strong* public sphere identifies with the activities that take place within the parliament of a constitutional and democratic regime, i.e. within the commissions and organisms that it includes in itself.²³

In turn, the *weak* public sphere possesses a communicative strength which is potentially endless, but it is not procedurally structured nor temporally limited. Therefore it remains devoid of any real and direct decision-making power. However, while the *strong* public spheres, those ‘of the parliamentary bodies’, structure themselves mainly as a *context of justification*, which is devoted to justifying the selection of specific problems as well as the choices taken as possible solutions to them, the *weak* public sphere constitutes an irreplaceable *context of discovery* and articulation of new problems and issues, that, in their turn, should be submitted to the evaluation of their respective *strong* public spheres.²⁴

²² N. Fraser, ‘Rethinking the Public Sphere. A Contribution to the Critique of Actually Existing Democracy’, in C. Calhoun (ed.), *Habermas and the Public Sphere* (Cambridge, MA: MIT Press, 1992), 109 ff. The same distinction was subsequently transposed by the same author of *Between Facts and Norms*.

²³ The words of Habermas again further clarify the concept: “In setting up parliamentary procedures, decision-making power (and assigned political responsibilities) provide the reference point from which socially bounded and temporarily limited publics are constituted. [...] Democratic procedures in such ‘arranged’ publics structure opinion- and will-formation processes with a view to the cooperative solution of practical questions, including the negotiation of fair compromises. The operative meaning of these regulations consists less in discovering and identifying problems than in dealing with them [...]” (Habermas (1996), n 19 above, 307).

²⁴ I take here the distinction between *context of justification* and *context of discovery* from Habermas (1996), n 19 above, 306 ff.

Compared with procedurally regulated public spheres, the *weak* public sphere has the advantage of being “a medium of *unrestricted* communication”: the *weak* public sphere allows us to see new problematic situations in a more sensitive way, as well as to elaborate discourses of self-clarification in larger and more expressive modalities, or to articulate collective identities and interpretations of needs by giving shape to a more comprehensive and difference-sensitive vocabulary.²⁵

Despite the fact that this (*weak*) conception of public sphere must recognise within itself the lack of the decisive nexus which connects the *discussion* and the shaping of an opinion to the subsequent *decision* and to the juridical implementation, such a conception can surely acknowledge its particularity – and, in a sense, its ‘strength’ – in the exercise of a twofold function.

That is, firstly, a *control* function, that, on the one hand, applies to the selection – made by whoever directly manages the power – of the issues to be discussed and, on the other, to the solutions officially adopted as answers to such issues. Systematically linked to this, there is a second and no less important *stimulus* function, which shapes itself starting from articulation and submission to the public administrators’ evaluation of emerging issues and of renewed interpretations of traditional needs. Understood in this way, the public sphere takes the form of an extra-political reality that – as opportunely affirmed by Charles Taylor – constitutes itself as the elaboration of “discourse of reason on and to power, rather than by power”.²⁶

²⁵ Cf. *ibidem*, 308.

²⁶ C. Taylor, ‘Liberal Politics and the Public Sphere’, in *idem*, *Philosophical Arguments* (Cambridge, MA: Harvard University Press, 1995), 257 ff, 265.

5. Towards a redefinition of conceptual and juridical vocabularies

How does what we have just sketched directly relate to the impact of new technologies? The main direction of answer to this issue should take into account another – and for the present purpose final – aspect of the same concept of ‘public sphere’. Such an aspect characterises the modern understanding of public sphere which faces a twofold destiny of fruition of that space which is intrinsically – and has to remain – ‘public’ alongside a *topical* conception of public sphere as one that is the result of the physical coexistence of its subjects, *meta-topical* forms of public spheres as well as communities that are arising and constantly gaining in importance. This type of public sphere/community tends to reduce the merely physical dimension of human relationships and to expand that which might be called their non-material dimension.

This fact brings up a further characteristic which connotes the participation of the individual in the community and particularly a radical shift between a modern and a contemporary way of participating itself: whilst in antiquity the individual participated in and was intensely connected to a single community to the point of having an almost exclusive relationship with it, the individual nowadays – in accordance with the tendency towards progressive liberation that has traversed the whole of modernity – neither can nor typically wants to be a member of a single community, but rather finds himself part of many, and is thus forced with varying degrees of awareness to participate in all of these with less intensity and constancy.

Undoubtedly, we are faced with (until few years ago unreleased) rules that the nets of communication which shape the ‘public opinion’ must deal with, because of the advent of Internet and fastly increasing new communication’s technologies.

This – properly speaking – ‘revolution’ about modalities of communication has introduced a profound change in what we have above called ‘social norms’ and unwritten rules of interrelations among individuals and groups. But this change has certainly involved more than just a modification of the formal rules of communication which accompanies the shaping of public spheres. In fact, it has been deeply supportive of a constitutive challenge for the contents of such spheres, that have hitherto created unedited and disruptive consequences for

both the philosophical and juridical framework which is the result of modernity.

In his most recent book, Stefano Rodotà has summed up a relevant facet of this challenge by using again the evocative term of ‘revolution’. Besides the not yet accomplished ‘revolution of equality’, that characterised the philosophical-political as well as juridical debate during the entire twentieth century, in recent years a ‘revolution of dignity’ has been gaining more and more importance. To quote Rodotà:

Insieme [si tratta della ‘rivoluzione dell’uguaglianza’ e della ‘rivoluzione della dignità’ menzionate appena sopra il passo riportato] hanno dato vita a una nuova antropologia, che mette al centro l’autodeterminazione delle persone, la costruzione delle identità individuali e collettive, i nuovi modi di intendere i legami sociali e le responsabilità pubbliche.²⁷

In this framework, the so called ‘revolution of technosciences’ is one of the most relevant chapters and one of the most challenging frontiers of the first revolution. This frontier opens up (almost daily) new issues for a reshaping of the relationship between human and not-(post- or trans-) human, but it also constantly produces new arguments for re-thinking the interaction among human bodies and machines. Nonetheless, such issues and arguments – joined with more or less awareness by their authors – are supporting creeping and potentially dangerous developments of human capacities that must be followed closely.

To take just one example in order to account for their relevance, the same developments challenge at its basis the entire philosophical-juridical frame that lies behind the formalisation of Article 3 of the Charter of Fundamental Rights of the European Union, which contemplates the “right to the integrity of the person”.²⁸

²⁷ S. Rodotà, *Il diritto ad avere diritti* (Roma-Bari: Laterza, 2012), 14 (“Together they [both revolutions just mentioned] have given rise to a new anthropology, that puts the emphasis on self-determination of persons, on the shaping of individual and collective identities, as well as on new ways of understanding social relationships and public responsibilities”). See also the essay by Rodotà, “Technology and regulation: a two-way discourse”, in this volume.

²⁸ The official text is available at the website: http://www.europarl.europa.eu/charter/pdf/text_en.pdf.

It is not possible to give here a detailed account of the groundbreaking effects introduced by the advent and constant increase of robotic technologies.²⁹ However, considered overall and just to follow the example, the impact of such technologies challenge each fundamental concept of the (almost entirely, but not only, Western) philosophical and juridical vocabulary recalled by the text of the article: namely, the concept of ‘*habeas corpus*’, perhaps the first (modern) individual right, moreover, that of respect, the need for informed consent, eugenics and cloning, and last but not least, the uses of the body devoted to financial gains.³⁰

Also those who are theoretically in favour of the so called trans-humanism cannot avoid correlating the positive judgement towards the enhancement of bodily and mental capabilities of humans via robotic or neurological technologies with the guarantee both of safety of such technologies, and of the right of self-government of each person’s own body within a democratic context.³¹

Here we can concretely experience what was said at the beginning about the so called ‘emerging technologies’: they contribute to shaping the question not only aboutto with himself. In doing that, they profoundly alter what was previously defined as the ‘normal relationship’ of the individual with his or her own body and, at the same time, they challenge both philosophy and law, namely conceptual

²⁹ As first reference texts, which explain the increasing multiplicity of theoretical orientations see: G. Bekey, *Autonomous Robots: From Biological Inspiration to Implementation and Control* (Cambridge, MA: MIT Press, 2005); W. Wallach and C. Allen, *Moral Machines: Teaching Robots Right from Wrong* (Oxford: Oxford University Press, 2009); B. Siciliano and O. Khatib (eds), *Springer Handbook of Robotics* (Berlin: Springer, 2008); P. Lin, K. Abney and G.A. Bekey (eds), *Robot Ethics. The Ethical and Social Implications of Robotics* (Cambridge, MA: MIT Press, 2012).

³⁰ Let us quote the entire Article 3: “1. Everyone has the right to respect for his or her physical and mental integrity. 2. In the fields of medicine and biology, the following must be respected in particular: – the free and informed consent of the person concerned, according to the procedures laid down by law; – the prohibition of eugenic practices, in particular those aiming at the selection of persons; – the prohibition on making the human body and its parts as such a source of financial gain; – the prohibition of the reproductive cloning of human beings”.

³¹ For a fundamental overview about this point see first J. Hughes, *Citizen Cyborg: Why Democratic Societies Must Respond to the Redesigned Human of the Future* (Cambridge, MA: Westview, 2004); P.K. Nayar, *Virtual Worlds: Culture and Politics in the Age of Cybertechnology* (New Delhi: Sage, 2004).

vocabularies and definitions of rights in new fields or in old – but made slippery – territories.³²

These multiple challenges open up an equally multiple agenda of reflection. Within a more general necessity of reshaping the semantic meaning of a great part of our conceptual and juridical vocabularies, there are at least two dossiers that cross both.

One of them is related to autonomy. This is a venerable concept, that has its roots in that philosophical and juridical path that starts with Descartes and, via Locke, Mill and the liberal tradition, culminates – at least – with Kant. Nowadays, one of the most stimulating areas of questioning about this ‘autonomy dossier’ takes place at the intersection of two different but interrelated issues: the first one relates to how – and within which limitations – we might conceive and concretely measure the autonomy of a subject whose body is ‘supported’ and integrated by technological devices and, at the same time, how we might conceive the liability and non-conditionability of its agency. The second issue challenges a still less explored field, which can tentatively be summed up in a fundamental question: In which sense and within which limitations might we extend the same discourse about autonomy to forms of non-human, or rather robotic, subjectivity? In other words, does it make sense to speak of autonomy for ‘non-human subjectivities’ and what is the better argumentative path for legitimating it?³³

But there is (at least) one other dossier that is particularly sensible to interdisciplinary approaches. This is devoted to the concept of *fairness*.³⁴

³² I have addressed some implications of this issue in A. Pirni, ‘The Challenge of Living with Oneself. Considerations for Rethinking the Prism of Embodiment’, in A. Métraux and J. Straub (eds), *Optimierungen des Humanen und prothetische Optimierungen* (Bielefeld: Transcript Verlag, forthcoming).

³³ We have started to address this point in E. Stradella *et al.*, ‘Subjectivity of Autonomous Agents. Some Philosophical and Legal Remarks’, in O. Boissier, G. Bonnet and C. Tessier (eds), *Rights and Duties of Autonomous Agents*, Proceedings of the 1st Workshop on Rights and Duties of Autonomous Agents (Montpellier, 28 August 2012), in conjunction with the 20th European Conference on Artificial Intelligence (ECAI 2012), 24 ff, available at <<http://ceur-ws.org/Vol-885>>.

³⁴ I will specifically address this issue in A. Pirni, ‘The Challenge of Fairness in Relation to Robotic Technologies: Considerations for a Philosophical and Legal Agenda’, paper proposal accepted for the workshop *Opportunities and Risks of Robotics in Relation to Human Values* (Tilburg, The Netherlands: Tilburg University, 23–24 April 2013).

The attempt to find a positive answer in the quest for fairness is surely one of the greatest challenges of our time. Such a challenge arises with a social and economic goal, but today it has acquired a new (perhaps no less problematic) context of application with reference to the rapidly developing robotic technologies. Seeking to overcome both a general vagueness typical of some references to such a concept within contemporary debate, and an equally empty reference to the right to equality, the principal point of reference is connected to how to avoid excluding individuals or groups from access to technological innovations related, for example, to medical care, elderly, and domestic uses. Emerging technologies open up a new list of goods which have to be integrated into an ideal 'welfare politics' capable of contemplating new possibilities of sharing the positive effects of such technologies, but also able to react against subtle forms of 'technological divide' which could find a place in the fold of a technology as apparently inclusive in its premises as potentially exclusive in fact – and not only for economic reasons.

These are just two examples of possible problematic intersections that undoubtedly constitute a comprehensive challenge for the entire range of social sciences which is crucial for the present and the future of our living together. This challenge, we mean, is at present just at its genesis, but it already appears as not simply reducible to verified theoretical and juridical terms.

If there is to be a response to this challenge, it can only arise from a sort of fusion of disciplinary horizons. In doing that, perhaps philosophy and law could retrace, with new force and motivations, ancient directions of cooperation.