



Inter Professional meeting
Part-Dieu Municipal Library - 15/11/2013

*"Man 2.0 and his environment – Between rejection and fascination". This theme gathered together some sixty interested parties, on 15 November 2013 at the Part-Dieu Municipal Library in Lyon, as part of the [Et si on en parlait \("Let's talk about it!"\)](#) series of encounters. **Entrepreneurs, researchers, artists and representatives of associations and institutions**, in the company of three researchers, reflected upon an important question: "How can society best guide technological innovation?" This article presents an overview of the various avenues explored.*

Who or what guides the development of new technologies?
Citizens, manufacturers, politicians... or the market?

By Adeline Charvet

In the Rhône-Alpes region, numerous researchers work in partnership with robotics and home automation companies, health institutions and regional authorities to render our environment "more intelligent" and to "enhance" our physical abilities. They seek to mitigate our vulnerabilities and occasionally our disabilities, lessen our energy consumption, render the region more attractive, facilitate our movement, etc. Within this context, what role does civil society – in the form of consumers or workers, patients or citizens – have to play? Does civil society find itself obligated to accept seemingly strange or foreign new technologies? Does it act as an inspiration for research? Does it guide – whether it likes it or not – technological innovation? And is it ready to live in an "augmented world"?

"With regard to companion robots, the expectations are many and interest is growing", replies Dominique Vaufreydaz, computer science researcher within the [PRIMA](#) ("Perception, Recognition and Integration for Activities Modelling") team at LIG (Grenoble Computer Science Laboratory) and at [INRIA](#). "In Japan, with its ageing population, the development of robotics is a national emergency", points out an expert in the audience (1). This demand is expected to trigger an explosion in robotics. "The markets should develop within five to ten years. Robotics-related technologies are now mature and we're attaining large-scale production", adds the computer scientist.

Reducing financial costs

When we evoke the expectations regarding, for instance, companion robots, exactly *whose* expectations are we considering? "We have a project with a mutual insurance company; for this company, keeping seniors longer at home reduces coverage costs by delaying their transfer to a retirement home – very expensive. And a robot with several successive users is used. This robot costs around €15,000 to produce in small series, but could drop under €10,000 if produced in greater quantity," explains Dominique Vaufreydaz, who then presents the context of his research, "We're ever asking such questions as: Who's paying for the equipment? To what extent will the company fund innovation?"

Exceeding our natural human limits

Not far removed from the augmentation of the human body and the environment via robotics is the enhancement of our cognitive abilities via psychostimulants. In the manner of a "brain-machine interface", these stimulants represent one way of satisfying the desire to exceed our natural human limits, the expressed goal of certain transhumanists. Referencing [a study carried out at the Université du Québec à Montréal \(UQAM\)](#) among students and young professionals, Jérôme Goffette, philosopher of health at the [Lyon-Est Medical Faculty](#) and the Université Claude-Bernard (Lyon I), pointed out that the pressure to perform is influenced by the users of psychostimulants, as well as by their employers according to the principle: "It's up to you to perform at the same level as your colleagues". The use of these products, it is argued, is therefore guided by a socio-economic reality in which one is expected to incessantly enhance one's capacities, while at the same time tackling a diverse day-to-day schedule comprising work, family, outings, studies, etc. "And this despite the lack of any clinical trial comparing the risks and benefits [of such psychostimulant use], in terms of either performance or health," adds Jérôme Goffette. An audience member responds: "It is urgent that we reflect upon the societal causes pushing us towards this acceleration."

And what about human relations?

"What type of society do we want? Are we not masking the needs of society? When we speak about companion robots, shouldn't we rather be focusing on social relationships?" asks someone further off in the audience. Indeed, human relations here represent an essential rather than marginal consideration. An audience member in a wheelchair participates in the debate: "Technological aids are important for autonomy, but too much robotics and technology risks making us prisoners of our solitude. Many disabled persons already don't go out, don't find work... **When must we put a brake on robotics in order to maintain our social ties?**" Dominique Vaufreydaz admits, "**We are obligated to refrain from furnishing services that threaten to further aggravate the lack of social contact,** to refrain from thinking that it's no longer necessary to visit those persons with robots at home." According to the computer science researcher, companion robots should be used to lessen the suffering of the assisted, to improve their autonomy in getting around away from home and to help them maintain a social life. For instance, such robots could verify that their senior users have recently interacted by telephone, or could provide them with scheduling assistance.

How to render robots "acceptable"

But do we really want a robot verifying that we call our friends? What does one accept from a machine meant to "keep us company"? "During our studies, we discovered that users did not accept having a hole drilled in their wall to accommodate the cord for the camera meant to monitor their actions. So, we instead placed the camera on a mobile robot in the apartment," explains Dominique Vaufreydaz regarding his research for maintaining seniors at home within "intelligent" living areas, such as the [Domus](#). "**Today, I see the capacity of companion robots to interact socially as a requirement for their acceptability.** Our goal is to render these robots capable of understanding persons' attitudes. A companion robot mustn't 'shout' each time it wants to speak to you."

But how does one measure what is acceptable?

"And what about assessing the acceptability of these technologies? Do any questionnaires exist? Are questions raised within the social sciences?" rightly asks a health professional present in the audience. The computer scientist explains, with regard to his approach, "We carry out tests in which persons interact with the robots in [livings labs](#) during one day and are then questioned concerning

their thoughts and feelings. We work with psychologists, gerontologists and specialists in the use of questionnaires." He then adds "Rejection is easier to detect for it is expressed. Acceptability is more complex, for the acceptability of a single day doesn't necessarily translate into long-term acceptability. **I am unaware of a single study on companion robots exceeding four or five days.**"

Assessing the benefits and risks, then making a decision

In Quebec, the [InterNE3LS](#) research group of the Interdisciplinary Institute for Technological Innovation (3IT) at the Université de Sherbrooke is developing an "analysis grid" for assessing the acceptability of diverse technologies. For this group, "acceptability" is not limited to the acceptance of a new technology, such as the companion robot, in one's day-to-day life. **"We consider that responsible robotic innovation implies an attempt to shed light on social choices based upon a global assessment of the various impacts** – on health, freedom, privacy, human identity and community. Both the positive impacts and the risks," explains Jean-Pierre Béland, philosopher and member of InterNE3LS. The research group utilizes the concept of "ethical acceptability", according to which any risk associated with an innovation may be deemed acceptable provided that one has sought to reduce said risk and the innovation's impact is worth the trouble. To move in this direction, InterNE3LS seeks to establish a dialogue between the different players of technological development (including citizens), by identifying the values of each interested party and looking beyond the various ideological debates. An admittedly complex task, given the fact that such values correspond to moral arguments employing such ambiguous terms as "human nature" and "dignity".

Are users given the opportunity to express themselves?

"We tend to consider innovations in terms of their acceptability. We look at their success or failure, but we would be well advised to base our considerations on social expectations," argues Jérôme Goffette. On this subject, an audience member asks manufacturers, **"Do you interact with the beneficiaries, the users of these technologies?** For instance, who informs the manufacturer of this robot capable of giving the baby its comforter back when it falls that, as a mother, the last thing in the world that I want is to be replaced, to lose my role as a parent?" Faced with this eloquent example of a mismatch between societal needs and research, the computer scientist explains how [focus groups](#) work: a dozen persons follow several scenarios involving robots and then share their opinions. "Certain functionalities of which we were very proud turn out to be completely trivial, while others appear that had escaped our attention," reveals the researcher.

"We have every reason to take into consideration the users, whether individuals or institutions, for they assure the pertinence of any innovation. If the innovation doesn't meet their needs, then it represents a complete waste of time for manufacturers and an unnecessary social cost," adds from the audience Johanne Patenaude, director of the InterNE3LS research group. "If we become involved in the care of a health professional for his patients, it's his responsibility to indicate whether or not our involvement interferes with his work."

For entrepreneurs, the question of lending an ear to users is presented in market terms. "We're increasingly opening up to the social sciences. **Our goal is to change the manner in which companies are created and to encourage them to focus on market demands.** They need assistance in identifying the real needs, but also in understanding what may be acceptably done with a robot," explains the representative of a manufacturing group.

Society and technological innovation are therefore expected to provide mutual guidance, monitoring

their reciprocal evolutions and occasionally groping their way along. The practice of assessing the impact of these new technologies still seems hesitant, even hazardous or absent at times. "**We consider how a robot must behave to be socially acceptable, but we haven't at all reflected upon the same robots' impact on people's behaviour,**" argues the computer scientist. The question is thought to have been first raised in North America. In 2011, in the United States, the work *Robot Ethics: The Ethical and Social Implications of Robotics* dealt with this subject (2), while the following year, in Canada, *Asimov et l'acceptabilité des robots* (3) invited readers to reflect upon the ethical acceptability of the impact of interactive robots on human behaviour. Will seniors in 2050 react the same way as those of 2014 to a robot reminding them to stay in touch with their friends? Perhaps not. "**Today's technophiles will prove more accepting of robots,**" affirms with a smile the computer scientist.

Notes

- (1) To respect the anonymity of exchanges during this interprofessional lunch, only the names of the conference's guest researcher-speakers are here cited.
- (2) Lin, Keith Abney, George A. Beke (supervisor), *Robot Ethics: The Ethical and Social Implications of Robotics*, Ed. The MIT Press, 2011. (400 pages)
- (3) Jean-Pierre Béland and Georges A. Legault. *Asimov et l'acceptabilité des robots*, Presses de l'Université Laval, Québec, 2012. (238 pages)

Resources

<https://pal.inria.fr> ("Personally Assisted Living" collaborative project)

<http://emotion-research.net> (research on affective computing, emotions and the man-machine interface)

Jean-Pierre Béland and Georges A. Legault. *Asimov et l'acceptabilité des robots*, Presses de l'Université Laval, Quebec, 2012. (238 pages)

Jean-Pierre Béland and Johane Patenaude (editors). *Nanotechnologies : développement, enjeux sociaux et défis éthiques*, Presses de l'Université Laval, Quebec, 2009. (124 pages)

Jean-Pierre Béland (editor). *L'homme biotech : humain ou posthumain ?*, Presses de l'Université Laval, Sainte Foy, 2006. (127 pages)

Articles published in peer-reviewed journals

Béland, J.-P. and Patenaude, J. "Risk and the Question of the Acceptability of Human Enhancement: The Humanist and Transhumanist Perspectives", *Dialogue*, 52, pages 377-394, 2013. DOI: 10.1017/S0012217313000607

Legault, G.-A., Patenaude, J. and Béland, J.-P. "Nanotechnologies and Ethical Argumentation: A Philosophical Stalemate?", *Open Journal of Philosophy*, Vol. 3, No. 1, 15-2, 2013. DOI: 10.4236/ojpp.2013.31004

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Patenaude, J., Legault, G.-A. and Tapin, D. "Nano Engineering: Ethical Issues and Social Governance", *Nano Engineering: Global Approaches to Health and Safety Issues*, edited by Dr. Patricia Dolez, Elsevier, 2013.